

SOLICITATION INFORMATION

September 16, 2011

RFQ #7449035

**TITLE: HVAC UPGRADE AT FMS 3
WARWICK ARMORY, MILITIA**

CLOSING DATE AND TIME: 10/11/11 AT 2:45 PM

PRE-BID/ PROPOSAL CONFERENCE: YES

DATE: 9/30/11 TIME: 1:00 PM

MANDATORY: NO

**LOCATION: MILITIA – WARWICK ARMORY
MEET AT MAIN ENTRANCE
541 AIRPORT ROAD
WARWICK, RI**

Questions concerning this solicitation must be received by the Division of Purchases at: construction@purchasing.ri.gov no later than 10/3/11 at 12:00 Noon (ET). Questions should be submitted in a Microsoft Word attachment. Please reference the RFQ # on all correspondence. Questions received, if any, will be posted on the Internet as an addendum to this solicitation. It is the responsibility of all interested parties to download this information.

SURETY REQUIRED: YES

BOND REQUIRED: YES

**JOHN O'HARA II
CHIEF BUYER**



JOH:da

Vendors register on-line at the State Purchasing Website at www.purchasing.ri.gov to be able to download a Bidder Certification Cover Form.

THIS PAGE IS NOT A BIDDER CERTIFICATION FORM

Solicit.doc
Revised 10/8/10

SECTION 00200

INVITATION TO BID

RFQ #7449035

Date: September 15, 2011

Owner: STATE OF RHODE ISLAND

Purchaser: Department of Administration
Division of Purchases
One Capitol Hill
Providence, Rhode Island 02908-5859

Engineer of Record: AKAL Engineering, Inc.
44 Central St. Unit 4
Berlin, MA 01503
Telephone: 508-869-0403 Fax: 508-869-2891

Project: HVAC Upgrade, FMS-3 Warwick Armory
Warwick, R.I 02886

Completion Time: Ninety (90) Calendar Days.

Contractors are invited to submit sealed bids on the above Project, to the Purchaser at the above address, on or before:

Time: 2:45 PM Date: 10/11/11

Plans and Specifications are available for download from the Rhode Island Division of Purchases website at www.purchasing.ri.gov.

Bidder is required to provide Bid Security in the form of a Bid Bond, or a certified check payable to the STATE OF RHODE ISLAND in the amount of a sum not less than 5 percent (5%) of the Bid price

The Owner will hold a prebid conference at: Militia – Warwick Armory
Meet at Main Entrance
541 Airport Road
Warwick, RI

Time: 1:00 PM Date: 9/30/11

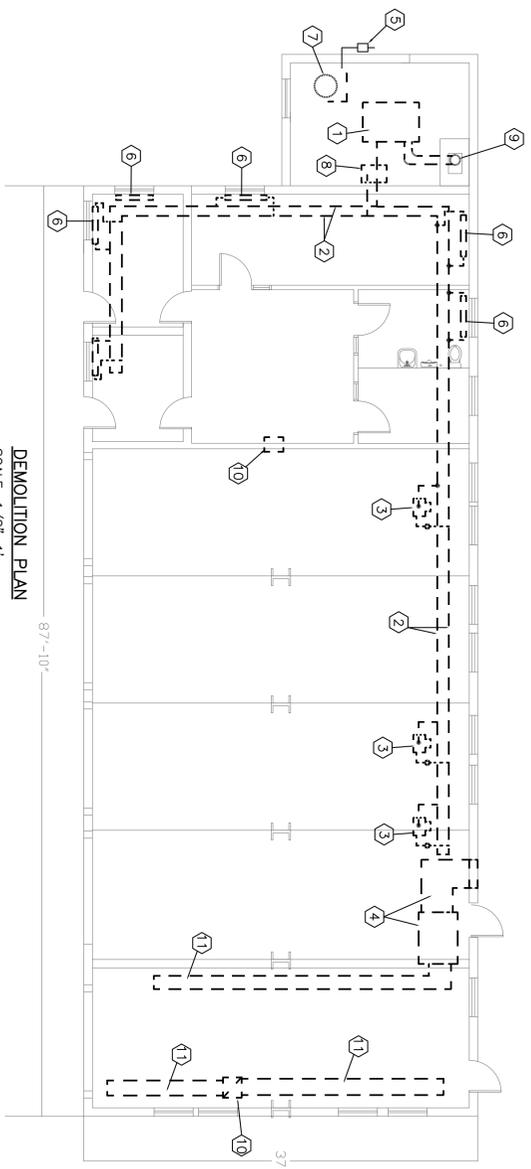
Refer to “Instruction to Bidders” for other Bidding Requirements.

Bidders' attention is referred to the State requirements pertaining to conditions of employment to be observed; included the Equal Employment Opportunity Act and requirements that 10 percent (10%) of the dollar value of the Work must be performed by Minority Business Enterprises, and wage rates to be paid under the Contract for this Project must be in accordance with those prevailing wages on file at the Rhode Island Department of Labor, Office of the Director, and included in this Project Manual. Bidders are subject to terms, conditions, and provisions of the state's General Conditions of Purchase, and to the provisions of Chapters 2, 12, 13, and Article 14.1 of Title 37, General Laws of the State of Rhode Island 1959, as amended.

The Office of Purchases reserves the right to accept or reject any of all Bids.

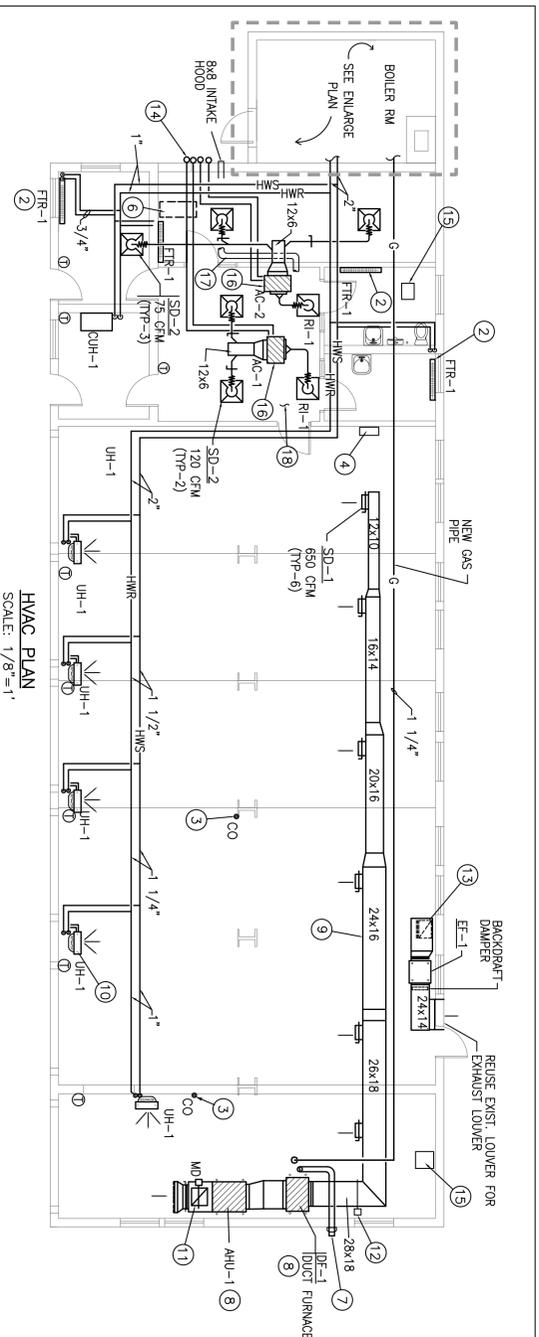
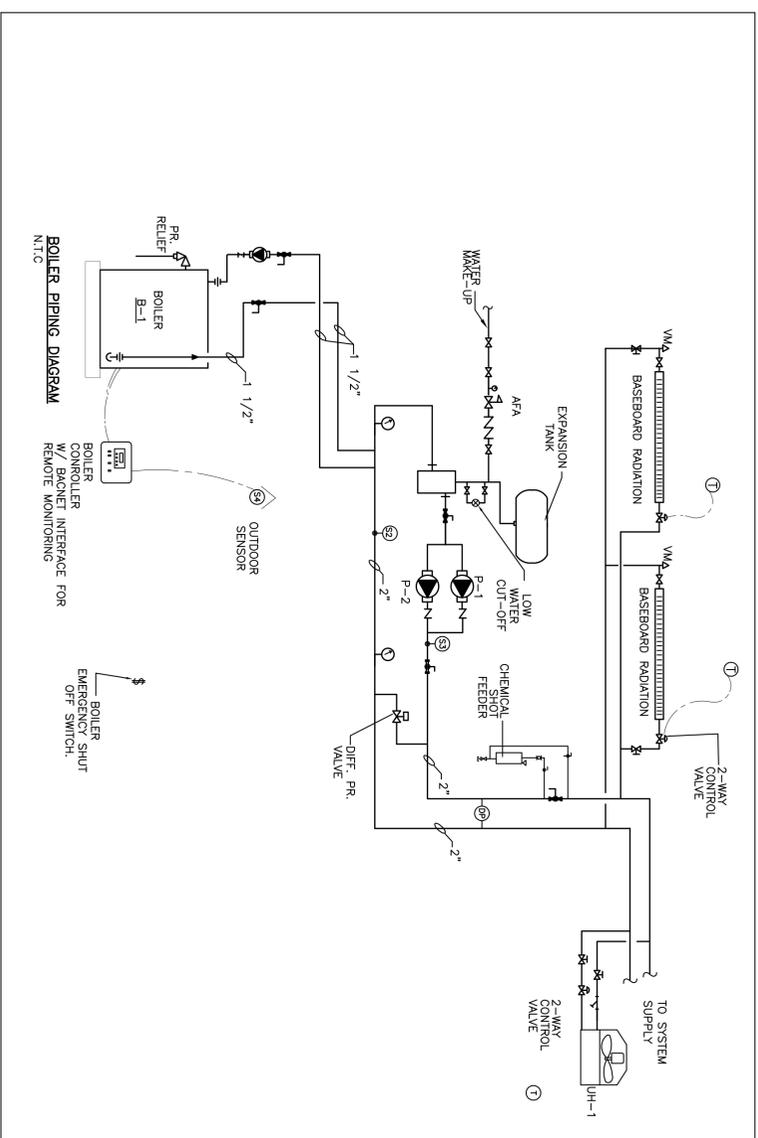
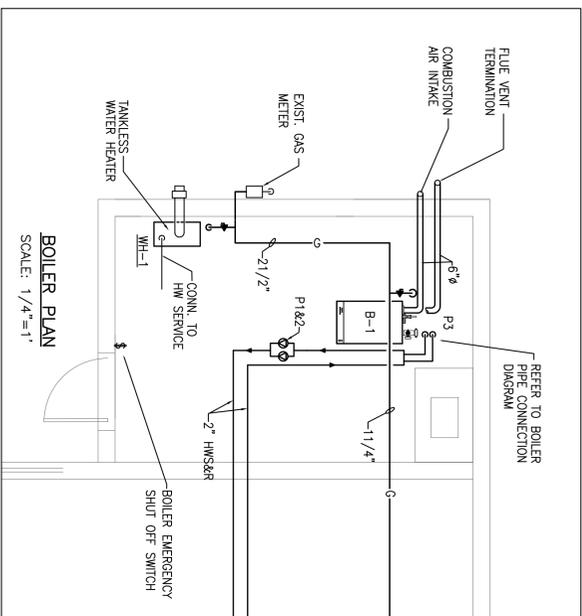
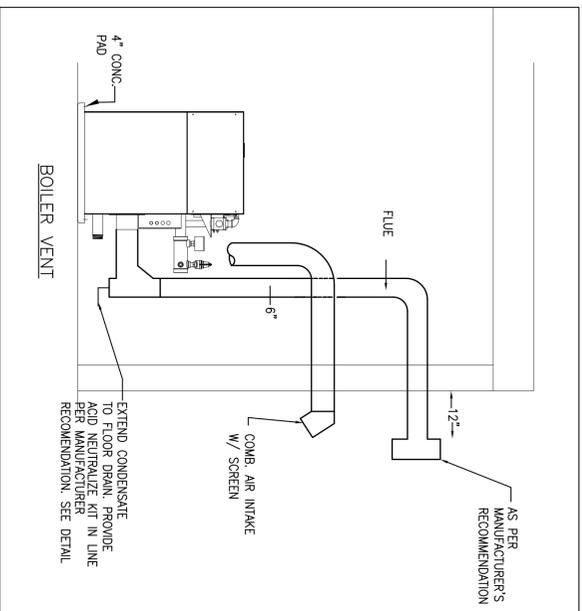
John O'Hara, Chief Buyer

END OF SECTION



DEMOLITION PLAN
SCALE: 1/8"=1'

- DEMOLITION NOTES**
- EXISTING STEAM BOILER AND ALL ASSOCIATED PIPING ETC. BE REMOVED.
 - EXISTING STEAM SUPPLY AND CONDENSATE PIPING IN CEILING SPACE TO BE REMOVED.
 - DISCONNECT AND REMOVE EXISTING UNIT HEATER DUCTWORK.
 - DISCONNECT AND REMOVE EXISTING AIR HANDLING UNIT AND ASSOCIATED DUCTWORK.
 - GAS METER TO REMAIN.
 - DISCONNECT AND REMOVE EXISTING BASEBOARD HEATERS.
 - DISCONNECT AND REMOVE EXISTING DOMESTIC HOT WATER HEATER.
 - DISCONNECT AND REMOVE EXISTING CONDENSATE PUMP AND PIPING.
 - DISCONNECT AND REMOVE EXISTING VERTICAL FLUE STACK AND ASSOCIATED CAP AND SEAL ROOF OPENING.
 - WINDOW A/C UNIT TO BE REMOVED.
 - DISCONNECT AND REMOVE DUCTWORK.



- PLAN NOTES**
- FURNISH AND INSTALL NEW CONDENSING BOILER. SEE PIPE CONNECTION DETAIL.
 - FURNISH AND INSTALL WALL MOUNTED BASEBOARD HEATER. PERFORMANCE TO BE MIN. 500 BTU/LF @ 140°F WATER.
 - CO SENSOR. REFER TO SPECIFICATION FOR CONTROLS.
 - CO CONTROLLER. REFER TO SPECIFICATION FOR CONTROLS.
 - SUPPORT HOT WATER UNIT HEATER BETWEEN DOOR GUIDES.
 - AIR COOLED HEAT PUMP UNIT ON ROOF. SEE PIPE CONNECTION DETAIL.
 - 4" FLUE WITH SIDE WALL TERMINATION KIT.
 - SUPPORT AIR HANDLING UNIT AND DUCT FURNACE FROM STRUCTURE ABOVE. REFER TO DWG M-2 FOR MOUNTING DETAIL.
 - COORDINATE DUCTWORK ROUTING WITH LIGHT FIXTURES AND CEILING FAN.
 - SUPPORT UNIT HEATER BETWEEN THE DOOR GUIDE. COORDINATE DIMENSION IN FIELD.
 - 16x16 OUTSIDE AIR INTAKE W/ MOTORIZED DAMPER. EXTEND DUCT UP THRU EXISTING ROOF PENETRATION AND TERMINATE W/ GOOSENECK AND MESH SCREEN.
 - DUCT SMOKE DETECTOR. INTERLOCK W/ AHU-1.
 - 24x14 DUCT DN. PROVIDE TWO 18x18 EXHAUST GRILLES. ONE HIGH AND ONE 8" AFF.
 - REFRIGERANT SUCTION AND LIQUID PIPING.
 - EXIST. EXHAUST FAN TO REMAIN.
 - SUPPORT AC UNIT HIGH IN CEILING. PROVIDE CONDENSATE DRAIN PIPE AND EXTEND TO THE NEAREST DRAIN.
 - 6" OUTSIDE AIR DUCT AND CONNECT 4" TO AC-1 & 2 RETURN AIR DUCT.
 - CONTRACTOR TO INCLUDE THE COST OF REMOVING AND RE-INSTALLING THE LAY IN CEILING TILES AFFECTED BY THE HVAC WORK. REPLACE TILES IF DAMAGED.

HVAC PLAN

FMS 3 Warwick Armory
541 Airport Rd., Warwick, RI. 02886

SHEET TITLE

AKAIA Engineering Inc.
44 Central St. Unit-4
Berlin, MA. 01503
Telephone - (508) 869-0403
Fax - (508) 869-2891
www.akalengineering.com

No.	Date	Revisions	By
A	-	-	OEC
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Date	06/15/11
Drawn by	AK
Chkd by	AK

Drawing
M-1
of
)

GAS FIRED DUCT FURNACE											
UNIT NO.	CFM	HEATING INPUT	HEATING OUTPUT	THERMAL EFF.	WEIGHT (LBS)	FAN MOTOR HP	ELECTRICAL DATA VOLTS	FLA	MOCF (AS STANDARD)	MANUFACTURER MODEL NUMBER	REMARKS
DF-1	3800	300 MBH	250 MBH	80	150	-	120V/1 PH	6	15	SC-300	① ②

① TWO-STAGE, INTERMITTENT PILOT IGNITION, 100% SHUT-OFF WITH CONTINUOUS RETRY

FAN SCHEDULE		AIR HANDLER UNIT SCHEDULE	
MARK	SERVICE BAY	MARK	AHU-1
EF-1	EF-1	MARK	AHU-1
INLINE	INLINE	SERVICE BAY	SERVICE BAY
2,500	2,500	TYPE	-
0.375	0.375	ARRANGEMENT	HORIZONTAL
-	-	FAN (GPM)	3,800
-	-	EXT. STATIC PR. (W/G)	0.75
-	-	FAN RPM	1200
1200	1200	BHP	-
1200	1200	MOTOR HP	1/4
0.45	0.45	ELECTRICAL	120V-1PH
1/2	1/2	MANUFACTURER	REZORR
LOREN COOK	LOREN COOK	MODEL NUMBER	RBA
150 SSM-8	150 SSM-8	REMARKS	① ② ③

- ① DUCT SMOKE DETECTOR
- ② FACTORY INSTALLED DISCONNECT SWITCH & STARTER
- ③ EXHAUST FAN INTERLOCK
- ④ HAND - AUTO-OFF SWITCH
- ⑤ BACKDRAFT DAMPER
- ⑥ OUTSIDE / RETURN AIR DAMPER AND CONTROL

TANKLESS WATER HEATER SCHEDULE									
TAG NO.	FUEL TYPE	INPUT (MBH)	MIN. EFF.	RECOVERY RATE AT 45° F RISE	EWT (°F)	LWT (°F)	ELECTRICAL DATA VOLTS	PHASE	MANUFACTURER AND REMARKS
WH-1	NAT GAS	15 / 150 MBH	95%	3.4 GPM	45	120	115	1	TANKLESS REMAIN V35H

1 FURNISH COMPLETE WITH FLUE VENT AND SIDE WALL VENT KIT.

OUTDOOR UNIT				INDOOR UNITS											
MARK	MODEL#	PERFORMANCE COOLING HEATING MBH	W/T	ELECTRICAL MCA	MOCF VOLTS	MARK	MODEL#	CFM	W/T	ELECTRICAL MCA	VOLTS	COOLING HEATING MBH	W/T	PERFORMANCE	MANUFACTURER
CU-1	KXZ-2420NA	20	22	130	15	20	208V-1PH	240	40	1	120V-1PH	9	10.9	10.9	MITSUBISHI (TWO ZONE) OR EQUAL

EXPANSION TANK					
TAG NO.	MANUFACTURER AND MODEL NO. OR EQUAL	TYPE	TANK VOLUME (GAL)	ACCEPT VOLUME (GAL)	REMARKS
ET-1	AMTROL ST-30V-C	STAND	14	9	

ACCEPTABLE MANUFACTURER: AMTROL, TACO, BELL & GOSSET OR APPROVED EQUAL.

GAS FIRED BOILER SCHEDULE						
UNIT NUMBER	SERVICE	WFR MAKE AND MODEL	WFR SERIC. TYPE	GROSS INPUT (MBH)	EFFICIENCY AT 150°	MAX. WORKING PRESSURE (PSIG)
B-1	HSSCO (4-4)	WASU-450	414	450	92%	50

- ① CONCENTRIC VENT KIT
- ② PROVIDE RI, CORE GAS TRIM, LOW WATER CUT-OFF, HIGH LIMIT & FLOW SWITCHES
- ③ PROVIDE FULLY MODULATING GAS VALVE.
- ④ PROVIDE ACID NEUTRALIZATION KIT
- ⑤ SMART SYSTEM DIGITAL OPERATING CONTROL W/ KEYPAD TO BASKET CONTROLLER

UNIT HEATER SCHEDULE (HOT WATER)																
TAG	TYPE	OUTPUT MBH	AIR CFM	EAT (°F)	LAT (°F)	RPM	BHP	HP	HZ	V	PH	ELECTRIC SERVICE GPM (F1)	EWT (°F)	P.D. (FT)	MANUFACTURER AND MODEL NUMBER	REMARKS
UH-1	ROBURN ZENITH	52.3	1000	60	103	1070	1/20	60	115	1	5.3	140	100	0.23	ARTHERM HA-728	

NOTES: 1 UNIT HEATER TO BE MANUFACTURED BY STERLING OR APPROVED EQUAL.
2 PROVIDE WITH POWER DISCONNECT. 3 OTHER APPROVED MANUFACTURER: STERLING, VULCAN OR EQUAL.

CABINET HEATER (HOT WATER) SCHEDULE																	
TAG	TYPE	OUTPUT (MBH)	AIR CFM	EAT (°F)	LAT (°F)	GPM (F1)	RPM	HP	HZ	V	PH	ELECTRIC SERVICE GPM (F1)	EWT (°F)	P.D. (FT)	MANUFACTURER AND MODEL NUMBER	REMARKS	
CUH-1	CEILING RECESSED	16.4	185	60	91.7	1.6	140	100	855	2	1050	1/15	60	115	1	ARTHERM C-02	1&2

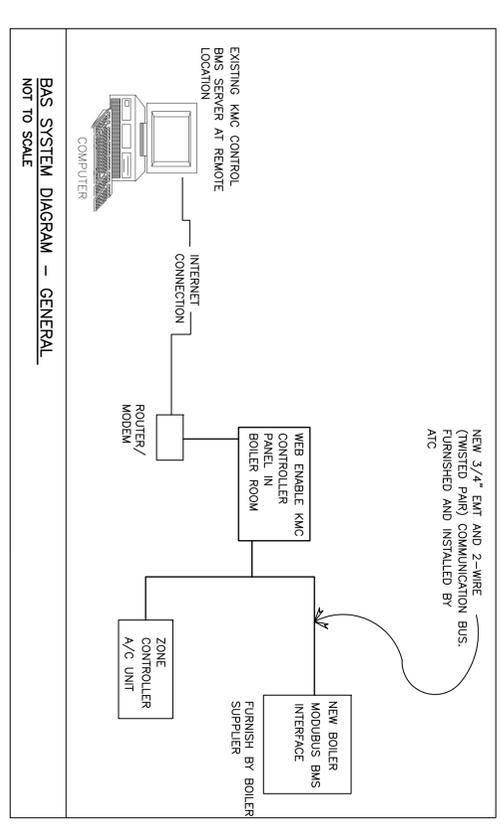
NOTES: 1 PROVIDE WITH POWERDISCONNECT. 2 OTHER APPROVED MANUFACTURER: STERLING, BEACON MORRIS OR EQUAL.

CIRCULATION PUMP SCHEDULE										
TAG NO.	MANUFACTURER AND MODEL NO. OR EQUAL	TYPE	FLOW RATE (GPM)	HEAD (FT)	BHP	HP	VOLT	PHASE	RPM	REMARKS
P-1&2	BELL & GOSSET	INLINE	30	35	0.5	3/4	-	1	1750	1
P-3	BELL & GOSSET 90 SR. SIZE 1A	INLINE	20	10	1.76	1/8	115	1	1750	

ACCEPTABLE MANUFACTURER: AMTROL, TACO, BELL & GOSSET OR APPROVED EQUAL.

DIFFUSER SCHEDULE					
TAG NO.	TYPE	MOUNTING TYPE	ACCESSORIES	PERFORMANCE SELECTION CRITERIA	MANUFACTURER OR EQUAL
SD-1	SUPPLY DIFFUSER	SURF MTD	OPPOSED BLADE DAMPER TTUS AG-35 OR EQUAL	CFM RANGE 18x8	TTUS-272RS
SD-2	SUPPLY DIFFUSER	24x24 MODULE	OPPOSED BLADE DAMPER TTUS AG-75 OR EQUAL	CFM RANGE 60-150	TTUS-TNSA
RI-1	PERFORATED RETURN	24x24 MODULE	-	CFM RANGE 250	TTUS-PAR

CONTROL SEQUENCE OF OPERATION



NEW 3/4" EMT AND 2-WIRE (TWISTED PAIR) COMMUNICATION BUS FURNISHED AND INSTALLED BY A/C

- ▶ ALL CONTROL FUNCTIONS AND REPORTING DESORBED HEIN SHALL BE ACCOMPLISHED BY A STANDALONE BOILER CONTROLLER FURNISH WITH BOILER MANUFACTURER
- ▶ TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE ALL THE NECESSARY WIRING, SENSORS ETC. AND CONFIGURE THE CONTROL AS NECESSARY TO ACCOMPLISH THE CONTROL SEQUENCE OF OPERATION.
- ▶ CONTROL DIAGRAM MAY NOT REFLECT THE ACTUAL SENSORS AND POINT AS SUPPLIED BY THE BOILER MANUFACTURER. ALL INTERFACE POINTS SHALL BE COORDINATED BY THE TEMPERATURE CONTROL CONTRACTOR WITH THE BOILER MANUFACTURER.
- ▶ WHILE THE BOILER CONTROLLER PROVIDE STANDALONE OPERATION OF ALL MECHANICAL EQUIPMENT IT SHALL BE INTERFACED WITH THE BUILDING'S EXISTING ENERGY MANAGEMENT SYSTEM THROUGH WEB ENABLE INTERNET CONNECTION
- ▶ THE INFORMATION COMMUNICATED BETWEEN THE BUILDING MANAGEMENT CONTROL AND THE FACTORY MOUNTED BOILER CONTROL INTERFACE MODULE (MODBUS) SHALL INCLUDE THE READING AND WRITING OF DATA TO ALLOW UNIT MONITORING, CONTROL, SETPOINTS AND ALARM NOTIFICATION ETC.

- ▶ HEATING MODE (OCCUPIED MODE)
PUMP P-1/P-2 SHALL RUN IN A LEAD/STANDBY FASHION AND SHALL RUN CONTINUOUSLY ON A DEMAND OF HEATING.
BOILER SHALL CYCLE TO MAINTAIN THE PRIMARY LOOP TEMPERATURE.
THE BOILER PUMP CIRCULATOR SHALL CYCLE AS REQUIRED TO MAINTAIN THE SECONDARY LOOP TEMPERATURE
THE OUTDOOR SENSOR SHALL RESET THE SECONDARY LOOP TEMPERATURE FROM 140°F TO 180°F AS IT RELATES TO THE OUTDOOR TEMPERATURE
THERMOSTATIC RADIATOR VALVE OF THE BASEBOARD HEATER SHALL MAINTAIN THE ROOM TEMPERATURE SET FOR OCCUPIED AND UNOCCUPIED MODE.

- 1. THE VEHICLE EXHAUST CONTROLLER SHALL CONTINUOUSLY MONITOR ITS CO AND CO2 LEVEL THROUGH ITS REMOTE SENSORS. SEE SPECIFICATION FOR DETAIL INFORMATION OF THE CONTROLLER.
- WHENEVER AN ALARM CONDITION IS DETECTED THE CONTROLLER SHALL DELAY EXHAUST FAN CONTACTS FOR 30 SECONDS. AFTER 30 SECONDS THE EXHAUST CONTACTS SHALL CLOSE AND ENERGIZE THE EF-1. WITH ITS ASSOCIATED OUTSIDE MOTORIZED AIR DAMPER. THE MINIMUM RUN TIME ON THE FAN SHALL BE FIELD SETTABLE FROM THE CONTROLLER FROM ONE TO EIGHT MINUTES. IN ONE MINUTE INCREMENTS. THE ASSOCIATED OUTDOOR DAMPER SHALL OPEN WHENEVER THE EXHAUST FAN STARTS.
- 2. SHOULD THE ALARM CONDITION REMAIN AFTER THE MINIMUM RUN TIME HAS TIMED OUT, THE EXHAUST FAN CONTACTS SHALL REMAIN CLOSED (ON) AND A SECOND "ALARM" SET OF CONTACTS SHALL CLOSE AND SHALL INITIATE THE AUDIBLE ALARM SIGNAL.
- 3. THE CONTROLLER SHALL ALSO HAVE A CLOCK TO OPERATE THE EXHAUST FAN EQUIPMENT ON A TIME BASIS. WITHD HIGH GAS LEVELS AND EXHAUST FAN CONTACTS SHALL OPERATE FROM ZERO TO EIGHT MINUTES. FIELD ADJUSTABLE IN ONE MINUTE INCREMENTS PER HOUR. THIS TIMED FAN RUN SHALL BE SEPARATE FROM THE MINIMUM RUN TIME SETTING.
- 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE CONTROL WIRING FROM SENSOR, CONTROL PANEL AND EXHAUST FAN STARTER RELAY AND OUTSIDE MOTORIZED DAMPER.

VEHICLE EXHAUST DETECTION AND CONTROL SEQUENCE

AHU-1 SEQUENCE OF OPERATION

- 1. AHU SHALL OPERATE ON TIME SCHEDULE BASIS.
- 2. DURING OCCUPIED MODE THE FAN SHALL RUN CONTINUOUSLY W/ OUTSIDE AIR DAMPER AT MINIMUM POSITION (20%)
- 3. IN WINTER MODE THE DUCT FURNACE SHALL MODULATE THE GAS BURNER TO MAINTAIN THE DUCT DISCHARGE AIR TEMPERATURE. PROVIDE CONTROL TO ADJUST THE DISCHARGE AIR TEMP. SETPOINT FROM REMOTE LOCATION.
- 4. IF THE OUTDOOR AIR PERMIT FREE COOLING, THE CONTROL SHALL ADJUST THE OUTSIDE AIR DAMPER TO FULL 100% OPEN POSITION.

FMS 3 Warwick Armory
541 Airport Rd., Warwick, RI. 02886
SHEET TITLE

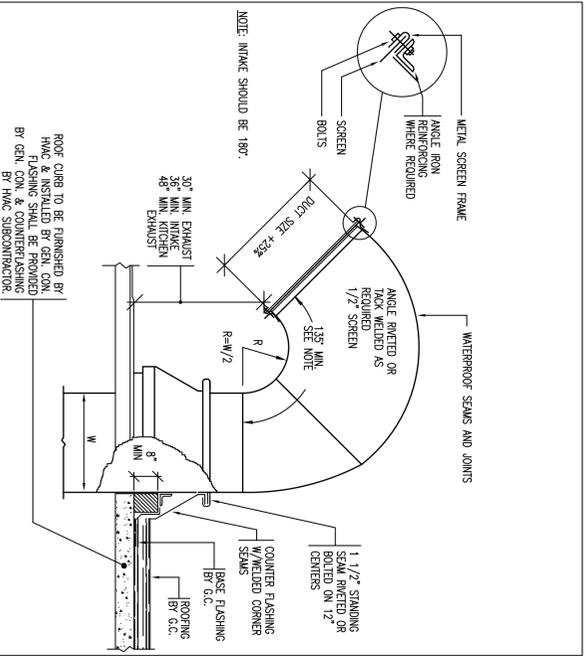
AKAIA Engineering Inc.
44 Central St. Unit-4
Berlin, MA. 01503
Telephone - (508) 869-0403
Fax - (508) 869-2891
www.akalengengineering.com

No.	Date	Revisions	By
A			OEC

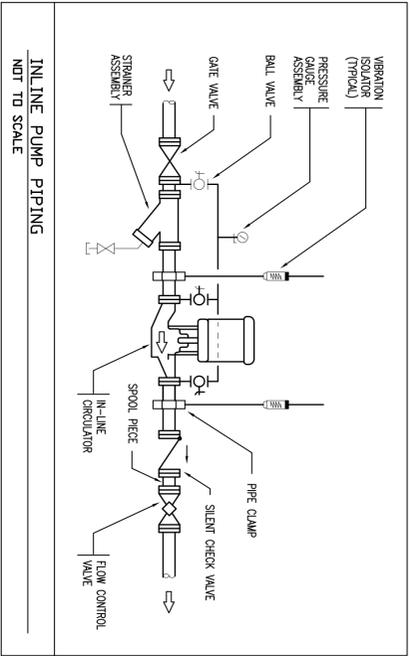
HVAC SCHEDULE & CONTROL

Date	06/15/11
Drawn by	AK
Chkd by	AK

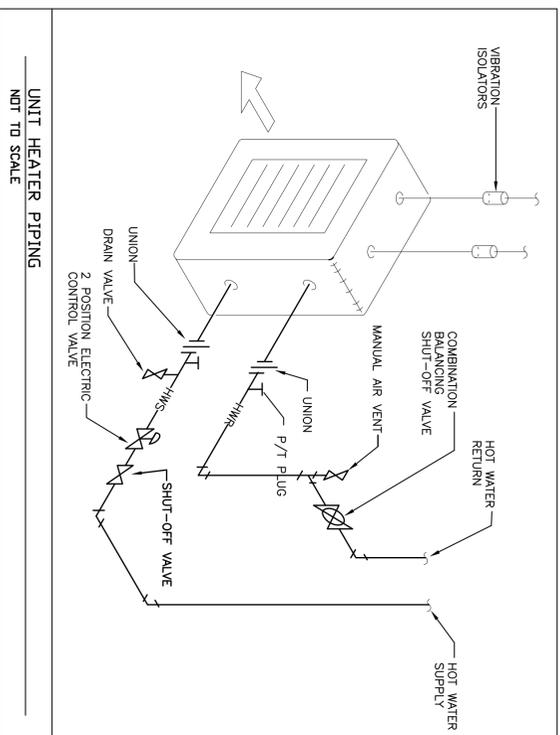
Drawing M-2 of



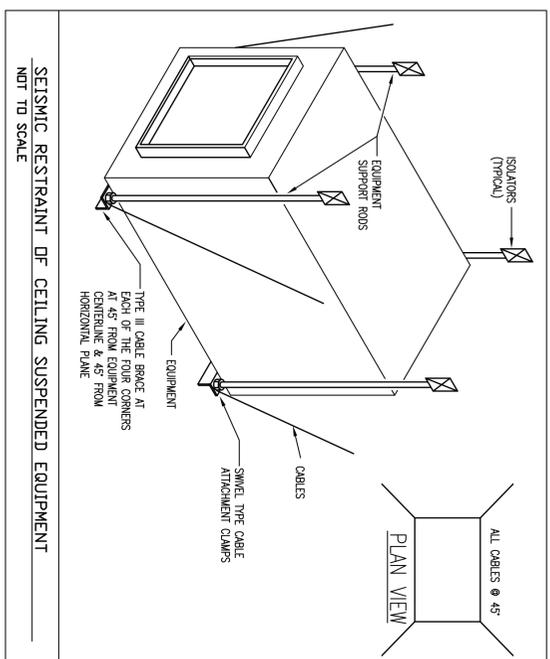
EXHAUST/INTAKE GOOSENECK
NOT TO SCALE



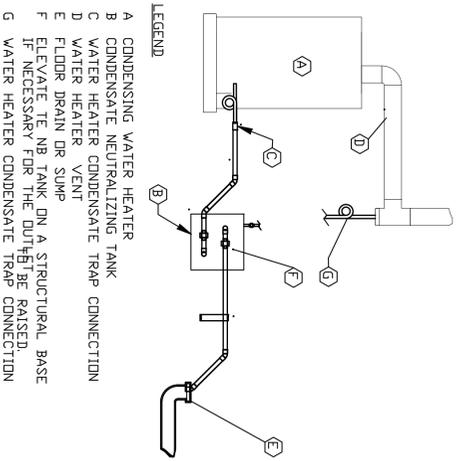
INLINE PUMP PIPING
NOT TO SCALE



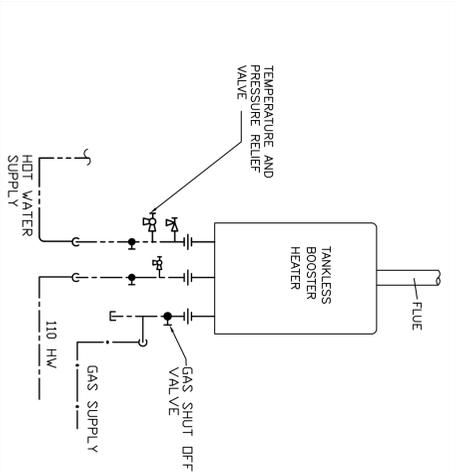
UNIT HEATER PIPING
NOT TO SCALE



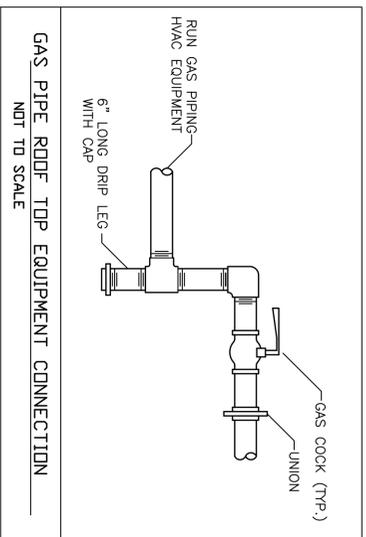
SEISMIC RESTRAINT OF CEILING SUSPENDED EQUIPMENT
NOT TO SCALE



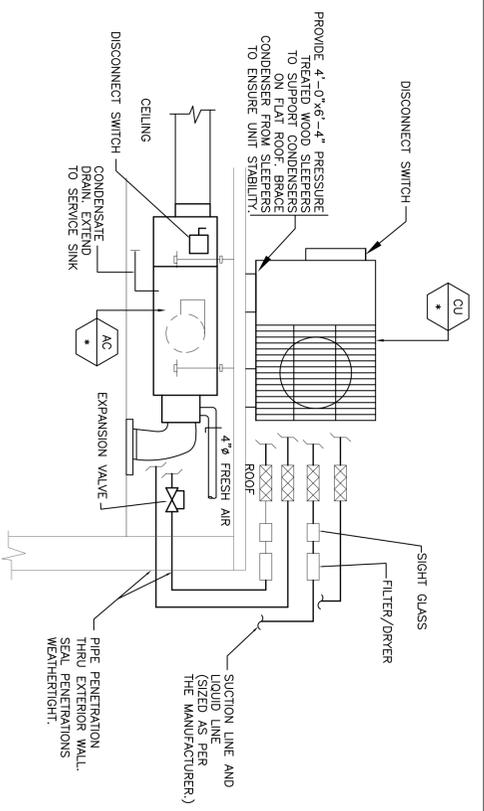
FLUE CONDENSATE DRAIN NEUTRALIZATION TANK DETAIL
NOT TO SCALE



GAS FIRED HOT WATER BOOSTER HEATER CONNECTIONS
NOT TO SCALE



GAS PIPE ROOF TOP EQUIPMENT CONNECTION
NOT TO SCALE



DUCTLESS COOLING ONLY SPLIT SYSTEM
NOT TO SCALE

No.	Date	Revisions	By
A	-	-	OEC
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

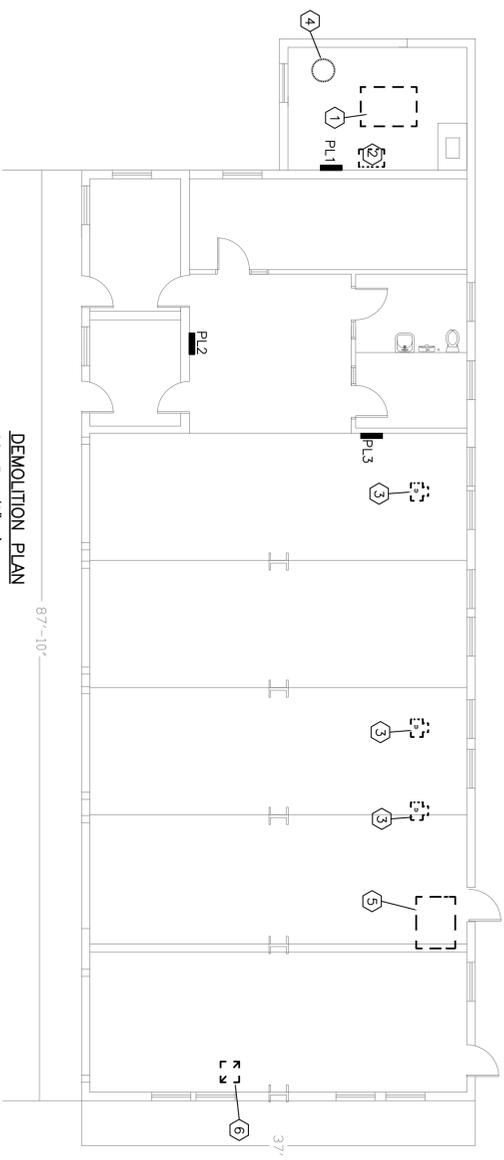
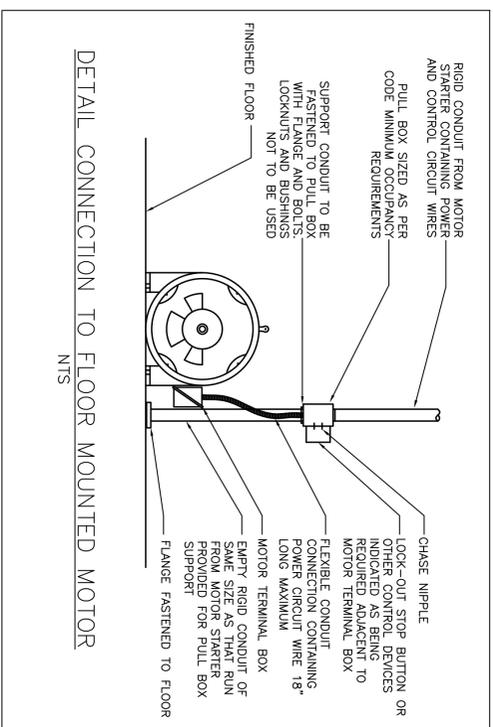
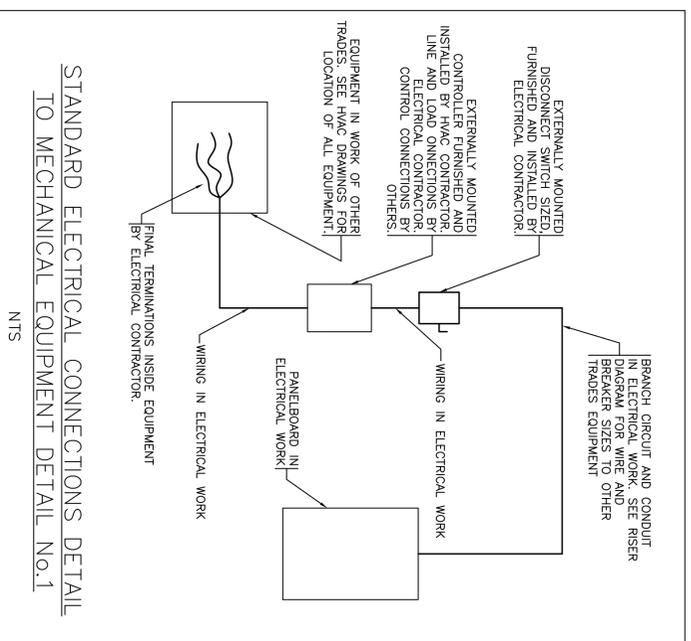
AKAIA Engineering Inc.
44 Central St. Unit-4
Berlin, MA. 01503
Telephone - (508) 869-0403
Fax - (508) 869-2891
www.akalengineering.com

FMS 3 Warwick Armory
541 Airport Rd., Warwick, RI. 02886
SHEET TITLE

HVAC DETAILS

Date	06/15/11
Drawn by	AK
Chkd by	AK

Drawing
M-3
of



- DEMOLITION NOTES**
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING BOILER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
 - DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING CONDENSATE PUMP TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
 - DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING UNIT HEATER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
 - DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING HOT WATER HEATER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
 - DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
 - DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING AC UNIT TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.

- GENERAL DEMOLITION NOTES:**
- EXISTING CONDUIT, WIRING, DEVICES AND OUTLET BOXES, UNLESS NOTED OTHERWISE, WHICH ARE CONCEALED IN EXISTING WALLS AND/OR CEILINGS WHICH ARE TO BE REMOVED SHALL BE DEENERGIZED AND REMOVED BY THE ELECTRICAL CONTRACTOR. THE ABOVE ITEMS, WHEN FOUND CONCEALED IN EXISTING WALLS AND CEILINGS WHICH ARE TO REMAIN, SHALL BE ABANDONED, WIRING REMOVED AND OUTLETS BLANKED BY ELECTRICAL CONTRACTOR.
 - THE ELECTRICAL CONTRACTOR SHALL INSPECT THE SITE PRIOR TO SUBMITTING HIS BID AND SHALL INVESTIGATE ALL CONDITIONS UNDER WHICH THIS WORK WILL BE PERFORMED. THIS SHALL INCLUDE DETERMINATION OF EXACT LOCATIONS OF ITEMS INDICATED ON THE DRAWINGS AS EXISTING. SUCH EXISTING LOCATIONS ARE DIAGRAMMATIC AND SHALL NOT BE CONSTRUED AS EXACT ENOUGH TO USE FOR EQUIPMENT AND LABOR ESTIMATION PURPOSES. FAILURE TO INSPECT EXISTING CONDITIONS OR TO FULLY UNDERSTAND
 - REFER THE HVAC AND PLUMBING CONTRACT DRAWINGS AND SPECIFICATIONS FOR EXACT QUANTITIES AND LOCATIONS OF ALL MECHANICAL AND PLUMBING EQUIPMENT BEING ABANDONED OR REMOVED, WHICH WILL REQUIRE DE-ENERGIZATION BY THE ELECTRICAL CONTRACTOR.
 - DO NOT INTERRUPT EXISTING SERVICES WITHOUT OWNER'S/ARCHITECT'S APPROVAL. SCHEDULED INTERRUPTIONS OF EXISTING SERVICES SHALL BE DIRECTED BY OWNER AND TO MINIMIZE IMPACT ON OWNER'S OPERATIONS. INCLUDE COST FOR OVERTIME HOURS TO PERFORM SUCH INTERRUPTIONS. CONNECTIONS AND RECONNECTIONS IN THE BID, SUBMIT PROPOSED METHODS FOR MINIMIZING INTERRUPTIONS AND REQUEST FOR INTERRUPTION IN WRITING TO THE ARCHITECT.
 - ALL ELECTRICAL AND MATERIALS INSTALLED IN RENOVATED AREAS SHALL BE NEW, UNLESS IT IS EXISTING EQUIPMENT DESIGNED TO BE RE-INSTALLED/USED. EXISTING ELECTRICAL EQUIPMENT TO BE RE-INSTALLED/USED SHALL BE CLEANED, MADE TOTALLY OPERATIONAL AND ADJUSTED FOR REUSE THIS CONTRACT.
 - DISCONNECT AT SOURCE AND REMOVE EXISTING ELECTRICAL MATERIALS AND EQUIPMENT, INCLUDING CONDUIT AND WIRES AND ALL OTHER ELECTRICAL ITEMS WHICH ARE RENDERED OBSOLETE BY THESE ALTERATIONS AND ADDITIONS.
 - DISCONNECT AND REMOVE AND RELOCATE EXISTING ELECTRICAL MATERIALS AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO WIRING DEVICES, CONTROL EQUIPMENT, CONDUIT AND WIRES AND ALL OTHER ELECTRICAL ITEMS WHICH INTERFERE OR INTERFERED WITH, OBSTRUCT OR ARE OBSTRUCTED BY THESE ALTERATIONS AND ADDITIONS. PERMANENTLY INSTALL SUCH ITEMS IN NEW LOCATION AS DIRECTED.
 - REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK.
 - MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS WHICH REMAIN.
 - ACTIVE MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.
 - WIRING AND MISCELLANEOUS EQUIPMENT, IF NOT REQUIRED BY OWNER, SHALL BE REMOVED FROM THE SITE AND PROPERLY AND LEGALLY DISPOSED OFF.
 - PANELBOARDS, CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS, REPLACE DAMAGED CIRCUIT BREAKERS AND PROVIDE CLOSURE PLATES FOR VACANT POSITIONS, PROVIDE TYPED CIRCUIT DIRECTORY SHOWING REVISED CIRCUITING ARRANGEMENT.

LEGENDS

⊞	MANUAL MOTOR STARTER COMPLETE WITH THERMAL OVERLOAD PROTECTION AND PILOT LIGHT.
⊞	DISCONNECT SWITCH, FUSED
⊞	MOTOR
⊞	1/3" DENOTES HORSE POWER RATING
⊞	MECHANICAL EQUIPMENT TAG
⊞	SEE HVAC DRAWINGS FOR DETAILS
⊞	HOWERUN TO PANEL, "PPHA" CIRCUIT #13
⊞	INDICATES QUANTITY OF #12 AWG-1 CU CONDUCTORS. GROUNDING CONDUCTORS ARE NOT INDICATED IN HASH MARKS. PROVIDE GROUNDING CONDUCTOR IN ACCORDANCE WITH SPECIFICATION. ALL CONDUITS SHALL BE SURFACE MOUNTED.
⊞	HOWERUN TO PANEL, "PPHA" CIRCUIT #1.3.5
⊞	VIA 3P/60A CIRCUIT BREAKER. PROVIDE GROUNDING CONDUCTOR IN ACCORDANCE WITH SPECIFICATION. ALL CONDUITS SHALL BE SURFACE MOUNTED.
⊞	SURFACE MOUNTED PANELBOARD

- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING BOILER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING CONDENSATE PUMP TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING UNIT HEATER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING HOT WATER HEATER TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING AIR HANDLING UNIT TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.
- DISCONNECT AND REMOVE EXISTING POWER FEED TO EXISTING AC UNIT TO BE REMOVED. REMOVE ALL WIRING, CONDUIT AND ASSOCIATED MATERIALS BACK TO SOURCE.

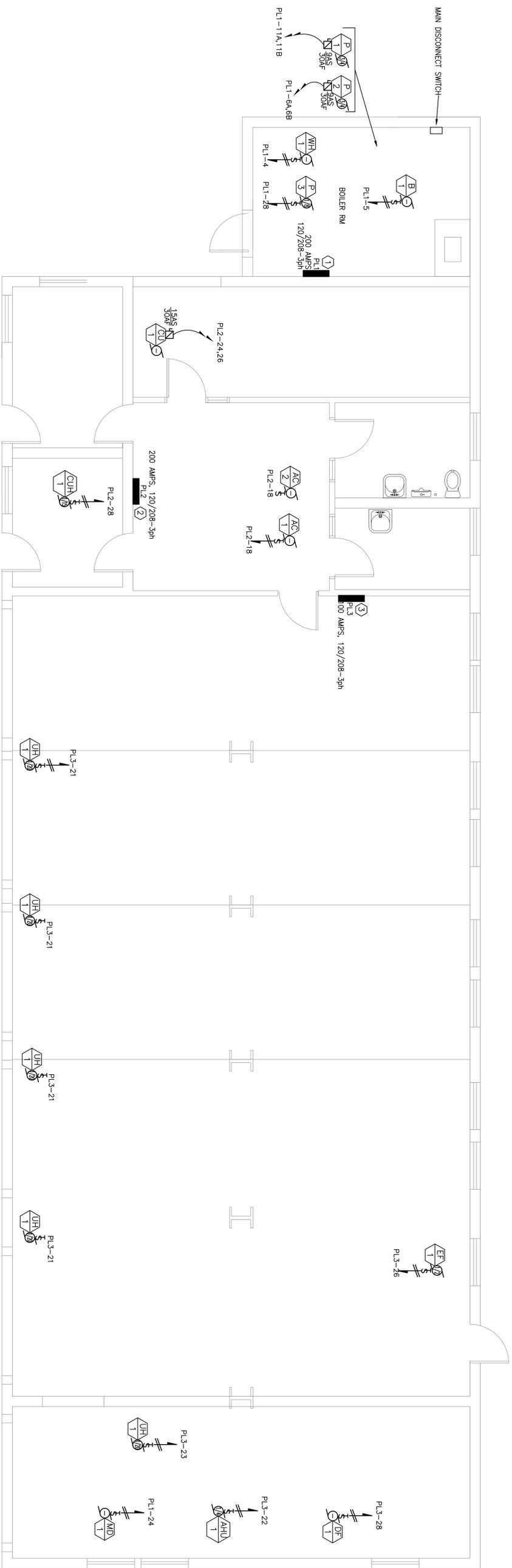
No.	Date	Revisions	By
A	-	-	OEC
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

AKAIA Engineering Inc.
 44 Central St. Unit 4
 Berlin, MA. 01503
 Telephone - (508) 869-0403
 Fax - (508) 869-2891
 www.akalengengineering.com

FMS 3 Warwick Armory
 541 Airport Rd., Warwick, RI. 02886
 SHEET TITLE

ELECTRICAL DEMO.
 PLAN, LEGEND,
 DETAILS AND NOTES

Date	06/15/11
Drawn by	JP
Chkd by	AK



ELECTRICAL PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTES

1. ALL WIRING SHALL BE RUN CONCEALED UNLESS SPECIFIED OTHERWISE.
2. ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, RECLAIMABLE TO BUILDING STRUCTURE.
3. EXACT LOCATION OF MECHANICAL EQUIPMENT THAT REQUIRE ELECTRICAL CONNECTIONS ARE SHOWN ON THE MECHANICAL DRAWINGS.
4. ALL RACEWAYS RUNNING THROUGH BUILDING EXPANSION JOINTS SHALL BE EQUIPPED WITH EXPANSION FITTINGS.
5. CONDUIT HOMERUNS SHOWN ON THE DRAWING WITH MORE THAN 3 CURRENT CARRYING CONDUCTORS ARE SHOWN DIAGRAMMATICALLY. THIS CONTRACTOR SHALL NOT INSTALL STRICTLY BY THE NATIONAL ELECTRIC CODE.
6. CONTRACTOR SHALL REVIEW ALL TRADES' CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR ELECTRICAL EQUIPMENT. COORDINATE EXACT MOUNTING LOCATIONS WITH THE ARCHITECT.
7. REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR MOUNTING HEIGHTS AND EXACT LOCATIONS OF ALL DEVICES.
8. REFER TO DETAILS.
9. ALL NEW EQUIPMENT THAT ARE FED FROM EXISTING CIRCUIT BREAKERS IN EXISTING PANELBOARDS SHALL USE NEW WIRING PER NATIONAL ELECTRICAL CODE.
10. ALL NEW EQUIPMENT THAT ARE FED FROM NEW CIRCUIT BREAKERS IN EXISTING PANELBOARDS SHALL USE NEW WIRING PER NATIONAL ELECTRICAL CODE.
11. ALL NEW CIRCUIT BREAKERS TO BE INSTALLED IN EXISTING PANELBOARDS SHALL HAVE THE SAME AIC RATING AS THE EXISTING PANELBOARD. EC SHALL FIELD VERIFY ALL RATINGS OF EXISTING PANELBOARDS BEFORE ORDERING.
12. EC SHALL FIELD VERIFY THE AVAILABILITY OF EXISTING CIRCUIT BREAKERS TO BE REPLACED OR RESED AND INFORM ENGINEER OF ANY DISCREPANCIES.
13. PROVIDE NEW UPDATED AND TYPED PANELBOARD DIRECTORIES.

ELECTRICAL NOTES

- ① EXISTING MAIN PANELBOARD PL1 TO REMAIN. EXISTING 3 POLE CIRCUIT BREAKER (11) FEEDING THE REMOVED VENT FAN SHALL BE REPLACED WITH A 20A, 2 POLE CIRCUIT BREAKER TO FEED THE NEW PUMP P-1.
- ② EXISTING 3 POLE CIRCUIT BREAKER (6) FEEDING THE REMOVED CONDENSATE PUMP SHALL BE REPLACED WITH A 20A, 2 POLE CIRCUIT BREAKER TO FEED THE NEW PUMP P-2.
- ③ EXISTING PANELBOARD PL2 TO REMAIN. EXISTING 3 POLE CIRCUIT BREAKER (24,26,28) FEEDING THE WH A 20A, 2 POLE CIRCUIT BREAKER TO FEED THE NEW COOLING UNIT CU-1 AND A 20A SINGLE POLE CIRCUIT BREAKER TO FEED THE NEW CABINET UNIT HEATER.
- ④ EXISTING PANELBOARD PL3 TO REMAIN. PROVIDE 6 NEW 20A SINGLE POLE CIRCUIT BREAKERS IN THIS PANELBOARD TO FEED NEW HVAC EQUIPMENT.

MECHANICAL EQUIPMENT SCHEDULE

EQUIPMENT TAG	EQUIPMENT DESCRIPTION/CHARACTERISTICS	VOLTS PHASE	PANEL-CKT. NUMBER	CIRC. BRK. AMPS POLES	CONNECTION REQUIREMENTS	ADDITIONAL EQUIPMENT REQUIREMENTS
P-1	CIRCULATION PUMP	208 1	PL1-11A,11B	20 2	X	X
P-2	CIRCULATION PUMP	208 1	PL1-6A,6B	20 2	X	X
P-3	CIRCULATION PUMP	115 1	PL1-28	20 1	X	X
B-1	GAS FIRED BOILER	115 1	PL1-5	20 1	X	X
WH-1	TANKLESS WATER HEATER	115 1	PL1-4	20 1	X	X
CU-1	DUCTLESS COOLING UNIT	208 2	PL2-24,26	20 2	X	-
CUH-1	CABINET UNIT HEATER	115 1	PL2-28	20 1	X	X
AC-1	COOLING INDOOR UNIT	115 1	PL2-18	20 1	X	X
AC-2	COOLING INDOOR UNIT	115 1	PL2-18	20 1	X	X
UH-1	UNIT HEATER	115 1	PL3-21 PL3-23	20 1	X	X
DF-1	GAS FIRED DUCT FURNACE	115 1	PL3-28	20 1	X	X
AHU-1	AIR HANDLING UNIT	115 1	PL3-22	20 1	X	X
MD-1	MOTORIZED DAMPER	115 1	PL3-24	20 1	X	X
EF-1	EXHAUST FAN	115 1	PL3-26	20 1	X	X

ELECTRICAL PLAN SCHEDULE AND NOTES

Date	06/15/11
Drawn by	JP
Chkd by	AK

FMS 3 Warwick Armory
541 Airport Rd., Warwick, RI. 02886

SHEET TITLE

AKAIA Engineering Inc.
44 Central St. Unit 4
Berlin, MA. 01503
Telephone - (508) 869-0403
Fax - (508) 869-2891
www.akalengineering.com

No.	Date	Revisions	By
A	-	-	OEC
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

PROJECT SPECIFICATION

HVAC Upgrade
at
FMS 3 Warwick Armory
541 Airport Rd.
Warwick, Rhode Island 02886

State of Rhode Island
Department of Administration

AKAL Engineering Inc
44 Central St. Unit 4
Berlin, MA 01503

June 2011

SECTION 00010

TABLE OF CONTENTS

BIDDING AND CONTRACT REQUIREMENTS

00010	TABLE OF CONTENTS
00100	INSTRUCTION TO BIDDERS
00110	SUPPLEMENTARY INSTRUCTIONS TO BIDDERS
00200	INVITATION TO BID
00300	BID FORM
00430	BID SECURITY FORM
00450	BIDDER'S QUALIFICATION FORM
00500	AGREEMENT FORM
00600	PERFORMANCE BOND; PAYMENT BOND
00700	GENERAL CONDITIONS
00800	SUPPLEMENTARY GENERAL CONDITIONS
00850	LIST OF DRAWINGS
00900	PREVAILING WAGE RATES

SPECIFICATIONS

DIVISION 1 – GENERAL REQUIREMENTS:

01010	SUMMARY OF WORK
01019	CONTRACT CONSIDERATIONS
01039	COORDINATION AND MEETINGS
01300	SUBMITTALS
01400	QUALITY CONTROL
01500	CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
01600	MATERIAL AND EQUIPMENT
01650	STARTING OF SYSTEMS
01700	CONTRACT CLOSEOUT

DIVISION 15 – MECHANICAL

15000	MECHANICAL ENGINEERING SPECIFICATIONS
-------	---------------------------------------

DIVISION 16 – ELECTRICAL

16000	ELECTRICAL ENGINEERING SPECIFICATIONS
-------	---------------------------------------

END OF SECTION

SECTION 00100

INSTRUCTIONS TO BIDDERS

AIA Document A701, Instructions to Bidders – 1997 Edition, is an integral part of the Bid Documents. Provisions which are not amended or supplemented remain in full force and effect.

The Document may be viewed in its entirety at the Rhode Island Building Commissioner's Office, located at One Capitol Hill, Providence, RI 02908

END OF SECTION

DRAFT AIA[®] Document A701[™] - 1997

Instructions to Bidders

for the following PROJECT:

(Name and location or address)

«HVAC Upgrade, FMS 3 Warwick Armory
»541 AirPort Road, Warwick, RI-02886
« »

THE OWNER:

(Name, legal status and address)

« »« »
« »

THE ARCHITECT:

(Name, legal status and address)

« AKAL Engineering
»«44 Central St. Berlin, MA 01503 »
« »

TABLE OF ARTICLES

- 1 DEFINITIONS
- 2 BIDDER'S REPRESENTATIONS
- 3 BIDDING DOCUMENTS
- 4 BIDDING PROCEDURES
- 5 CONSIDERATION OF BIDS
- 6 POST-BID INFORMATION
- 7 PERFORMANCE BOND AND PAYMENT BOND
- 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

ELECTRONIC COPYING of any portion of this AIA[®] Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

SECTION 00110

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify, change, delete from, or add to “Instructions to Bidders,” AIA Document A701, Fourth Edition, 1997. Where any Article is modified or any Paragraph or subparagraph is modified or deleted, the unaltered provisions of that Article, Paragraph, or subparagraph shall remain in effect.

ARTICLE 3 BIDDING DOCUMENTS

3.1.1 Delete in its entirety and substitute the following:

3.1.1 Bid Documents may be examined at no charge at the office of the Rhode Island State Building Code Commissioner, One Capitol Hill, Providence, RI 02908-5859. Bid Documents, in the form of a CD, may be obtained from the office of the Building Code Commission at no charge

ARTICLE 5 CONSIDERATION OF BIDS

5.3.1.1 Minority Business Enterprises – Pursuant to the provisions of Title 37, Chapter 14.1 of the General Laws, the State reserves the right to apply additional consideration to offers, and to direct awards to bidders other than the responsive bid representing the lowest price where:

- a. The offer is fully responsive to the terms and conditions of the request, and
- b. The price offer is determined to be within a competitive range (not to exceed 5% higher than the lowest responsive price offer) for the produce or service, and
- c. The firm making the offer has been certified by the R.I. Department of Economic Development to be a small business concern meeting the criteria established to be considered a Minority Business Enterprise.

ARTICLE 6 POST-BID INFORMATION

6.2 Delete in its entirety without substitution.

Add the following Section 6.3.3.4:

6.3.3.4 SUBMITTALS: Bidders’ attention is referred to the State requirements pertaining to conditions of employment to be observed; included the Equal Employment Opportunity Act and requirements that 10 percent (10%) of the dollar value of the Work must be performed by Minority Business Enterprises, and wage rates to be paid under the Contract for this Project must be in accordance with those prevailing wages on file at the Rhode Island Department of Labor, Office of the Director, and included in this Project Manual. Bidders are subject to terms, conditions, and provisions of the state’s General Conditions of Purchase, and to the provisions of Chapters 2, 12, 13, and Article 14.1 of Title 37, General Laws of the State of Rhode Island 1959, as amended.

ARTICLE 7 PERFORMANCE AND PAYMENT BOND

7.1.1 through 7.1.3 Delete in its entirety, and substitute the following:

7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds must be secured through a surety company licensed to do business in the State of Rhode Island. Their costs shall be included in the Bid.

7.2.1 Delete in its entirety, and substitute the following:

7.2.1 The Bidder shall deliver the required bonds to the Owner prior to the date of execution of the Contract.

7.2.3 Delete in its entirety and substitute the following:

7.2.3 The Bonds shall be dated before the date of the contract.

END OF SECTION

SECTION 00110

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify, change, delete from, or add to “Instructions to Bidders,” AIA Document A701, Fourth Edition, 1997. Where any Article is modified or any Paragraph or subparagraph is modified or deleted, the unaltered provisions of that Article, Paragraph, or subparagraph shall remain in effect.

ARTICLE 3 BIDDING DOCUMENTS

3.1.1 Delete in its entirety and substitute the following:

3.1.1 Bid Documents may be examined at no charge at the office of the Rhode Island State Building Code Commissioner, One Capitol Hill, Providence, RI 02908-5859. Bid Documents, in the form of a CD, may be obtained from the office of the Building Code Commission at no charge

ARTICLE 5 CONSIDERATION OF BIDS

5.3.1.1 Minority Business Enterprises – Pursuant to the provisions of Title 37, Chapter 14.1 of the General Laws, the State reserves the right to apply additional consideration to offers, and to direct awards to bidders other than the responsive bid representing the lowest price where:

- a. The offer is fully responsive to the terms and conditions of the request, and
- b. The price offer is determined to be within a competitive range (not to exceed 5% higher than the lowest responsive price offer) for the produce or service, and
- c. The firm making the offer has been certified by the R.I. Department of Economic Development to be a small business concern meeting the criteria established to be considered a Minority Business Enterprise.

ARTICLE 6 POST-BID INFORMATION

6.2 Delete in its entirety without substitution.

Add the following Section 6.3.3.4:

6.3.3.4 SUBMITTALS: Bidders’ attention is referred to the State requirements pertaining to conditions of employment to be observed; included the Equal Employment Opportunity Act and requirements that 10 percent (10%) of the dollar value of the Work must be performed by Minority Business Enterprises, and wage rates to be paid under the Contract for this Project must be in accordance with those prevailing wages on file at the Rhode Island Department of Labor, Office of the Director, and included in this Project Manual. Bidders are subject to terms, conditions, and provisions of the state’s General Conditions of Purchase, and to the provisions of Chapters 2, 12, 13, and Article 14.1 of Title 37, General Laws of the State of Rhode Island 1959, as amended.

ARTICLE 7 PERFORMANCE AND PAYMENT BOND

7.1.1 through 7.1.3 Delete in its entirety, and substitute the following:

under the Contract for this Project must be in accordance with those prevailing wages on file at the Rhode Island Department of Labor, Office of the Director, and included in this Project Manual. Bidders are subject to terms, conditions, and provisions of the state's General Conditions of Purchase, and to the provisions of Chapters 2, 12, 13, and Article 14.1 of Title 37, General Laws of the State of Rhode Island 1959, as amended.

The Office of Purchases reserves the right to accept or reject any of all Bids.

Assistant Director for Special Projects
Interim Purchasing Agent

END OF SECTION

SECTION 00200

INVITATION TO BID

Date: _____

Owner: STATE OF RHODE ISLAND

Purchaser: Department of Administration
Division of Purchases
One Capitol Hill
Providence, Rhode Island 02908-5859

Engineer of Record: AKAL Engineering, Inc.
44 Central St. Unit 4
Berlin, MA 01503
Telephone: 508-869-0403 Fax: 508-869-2891

Project: HVAC Upgrade, FMS-3 Warwick Armory
Warwick, R.I 02886

Completion Time: Ninety (90) Calendar Days.

Contractors are invited to submit sealed bids on the above Project, to the Purchaser at the above address, on or before:

Time: _____ (a.m./p.m.) Date: _____

Bid Documents may be examined at no charge at the office of the Rhode Island State Building Code Commissioner, One Capitol Hill, Providence, RI 02908-5859. Bid Documents, in the form of a CD, may be obtained from the office of the Building Code Commission at no charge.

Bid Documents will be available for pickup in person only, between the hours of 8:30 AM to 4:00 PM, from:

Dates: _____ to _____

Bidder is required to provide Bid Security in the form of a Bid Bond, or a certified check payable to the STATE OF RHODE ISLAND in the amount of a sum not less than 5 percent (5%) of the Bid price.

The Owner will hold a prebid conference at: _____

Time: _____ (a.m./p.m.) Date: _____

Refer to "Instruction to Bidders" for other Bidding Requirements.

Bidders' attention is referred to the State requirements pertaining to conditions of employment to be observed; included the Equal Employment Opportunity Act and requirements that 10 percent (10%) of the dollar value of the Work must be performed by Minority Business Enterprises, and wage rates to be paid

under the Contract for this Project must be in accordance with those prevailing wages on file at the Rhode Island Department of Labor, Office of the Director, and included in this Project Manual. Bidders are subject to terms, conditions, and provisions of the state's General Conditions of Purchase, and to the provisions of Chapters 2, 12, 13, and Article 14.1 of Title 37, General Laws of the State of Rhode Island 1959, as amended.

The Office of Purchases reserves the right to accept or reject any of all Bids.

Assistant Director for Special Projects
Interim Purchasing Agent

END OF SECTION

SECTION 00300

BID FORM

Date: _____

To: _____

Project: HVAC Upgrade
FMS 3 Warwick Armory, Warwick, RI 02886

Date: _____

Submitted by: _____

1. BID

Having examined the Place of the Work and all matters referred to in the "Instructions to Bidders" and in the Contract Documents prepared by AKAL Engineering, Inc. for the above mentioned project, we the undersigned, hereby propose to enter into Contract to perform the Work for the sum of:

Base Bid:

_____ (\$ _____)
(written, and numerically)

Add Alternative : None

_____ (\$ _____)
(written, and numerically)

We have included the following Allowance(s) per Division 1, Section 01019, Contract considerations in the above Base Bid sum:

Contingency Allowance:

\$ 5,000

We have included the required Bid security in compliance with the "Invitation to Bid."

2. ACCEPTANCE

This Bid shall be irrevocably open to acceptance for 60 days from the Bid closing date. If this Bid is accepted by the Owner within 60 days, we will:

Furnish the required bonds in compliance with amended provisions of the "Instructions to Bidders."

Commence Work within seven days after receipt of a Purchase Order.

If this Bid is accepted within 60 days, and we fail to commence the Work, or we fail to provide the required bond(s), the Bid security deposit shall be forfeited as damages to the Owner by reason of our failure, limited in amount to the lesser of the value of the security deposit, or of the difference between this Bid and the Bid upon which the Contract is signed.

In the event of Bid is not accepted within 60 days, the required security deposit shall be returned to the undersigned, in compliance with the provisions of the "instructions to Bidders," unless a mutually satisfactory arrangement is made in writing for its retention and validity for an extended period of time.

3. CONTRACT TIME

If this Bid is accepted, we will achieve Substantial Completion of the Work in _Ninty (90) calendar days from receipt of a Purchase Order.

Liquidated Damages, In as much as Time is of the Essence:

If we fail to achieve certification of substantial Completion at the expiration of the agreed upon Contract Time indicated above, we acknowledge we will be assessed Liquidated Damages for each calendar day the Project continues to be in default of Substantial Completion, as follows:

\$100 per calendar day.

4. ADDENDA

The following Addenda have been received. The noted modifications to the Bid Documents have been considered and all associated costs are included in the Bid sum.

Addendum No. 1, dated _____.

Addendum No. 2, dated _____.

5. REQUIREMENT FOR LICENSE NUMBER

In compliance with the requirements of Rhode Island General Law, Section 5-65-23, my Rhode Island license number for the work to be performed by this firm as prime contractor is:

LICENSE NUMBER: _____

6. BID FIRM SIGNATURES

(Bidder's Name)

By: _____

Title: _____

Corporate Seal:

END OF SECTION

Bid Bond

CONTRACTOR:

(Name, legal status and address)

<< >><< >>
<< >>

SURETY:

(Name, legal status and principal place of business)

<< >><< >>
<< >>

OWNER:

(Name, legal status and address)

<< >><< >>
<< >>

BOND AMOUNT: \$ << >>

PROJECT:

(Name, location or address, and Project number, if any)

HVAC Upgrade
FMS 3 Warwick Armory
541 Airport Road, Warwick, RI 02886<< >>
<< >>

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

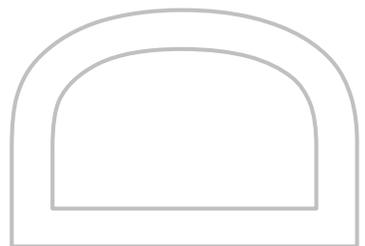


ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.



ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

Signed and sealed this « » day of « », « »

(Witness)

(Witness)

« »

(Contractor as Principal) (Seal)

« »

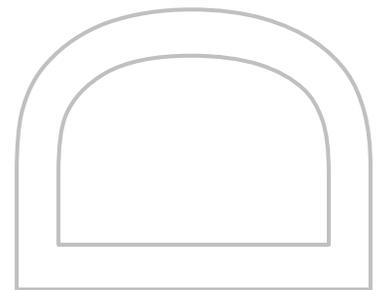
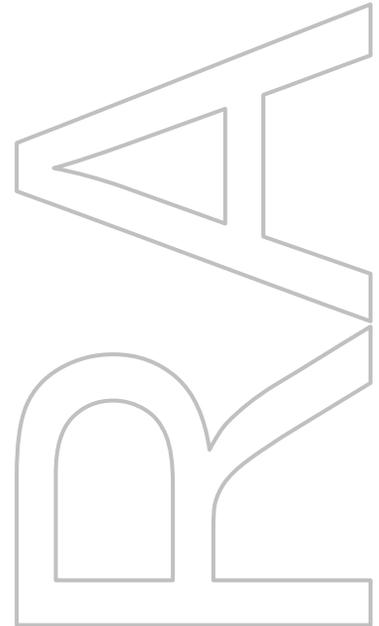
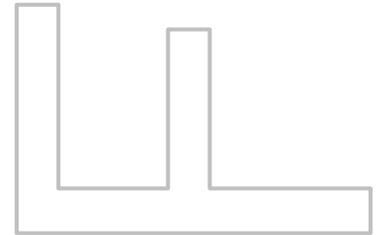
(Title)

« »

(Surety) (Seal)

« »

(Title)



SECTION 00450

BIDDER'S QUALIFICATION FORM

AIA Document A305 – Contractor's Qualifications Statement, 1986 Edition, is an integral part of the Bid Documents for use in evaluating the qualifications of Contractors.

The Document may be viewed in its entirety at the Rhode Island Building Commissioner's Office, located at One Capitol Hill, Providence, RI 02908

Failure of the announced low numerical bidder to respond with relevant information to the stated requirements of this Document 00450 may disqualify that bidder from further consideration as a bidder on this project

END OF SECTION

DRAFT AIA® Document A305™ - 1986

Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO: << >>

ADDRESS: << >>

SUBMITTED BY: << >>

NAME: << >>

ADDRESS: << >>

PRINCIPAL OFFICE: << >>

[<< >>] Corporation

[<< >>] Partnership

[<< >>] Individual

[<< >>] Joint Venture

[<< >>] Other << >>

NAME OF PROJECT: (if applicable) <<HVAC Upgrade, FMS 3 Warwick Army>>

TYPE OF WORK: (file separate form for each Classification of Work)

[<< >>] General Construction

[<< >>] HVAC

[<< >>] Electrical

[<< >>] Plumbing

[<< >>] Other: (Specify) << >>

§ 1 ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor? << >>

§ 1.2 How many years has your organization been in business under its present business name? << >>

§ 1.2.1 Under what other or former names has your organization operated?

<< >>

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation: << >>

§ 1.3.2 State of incorporation: << >>

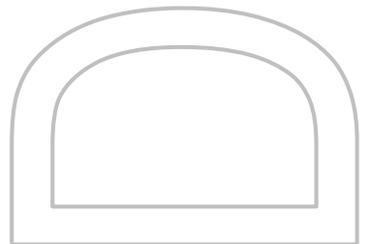
§ 1.3.3 President's name: << >>

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.



ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

§ 1.3.4 Vice-president's name(s)

<< >>

§ 1.3.5 Secretary's name: << >>

§ 1.3.6 Treasurer's name: << >>

§ 1.4 If your organization is a partnership, answer the following:

§ 1.4.1 Date of organization: << >>

§ 1.4.2 Type of partnership (if applicable): << >>

§ 1.4.3 Name(s) of general partner(s)

<< >>

§ 1.5 If your organization is individually owned, answer the following:

§ 1.5.1 Date of organization: << >>

§ 1.5.2 Name of owner:

<< >>

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

<< >>

§ 2 LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

<< >>

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

<< >>

§ 3 EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

<< >>

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

<< >>

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

<< >>

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

<< >>

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

<< >>

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

<< >>

§ 3.4.1 State total worth of work in progress and under contract:

<< >>

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

<< >>

§ 3.5.1 State average annual amount of construction work performed during the past five years:

<< >>

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

<< >>

§ 4 REFERENCES

§ 4.1 Trade References:

<< >>

§ 4.2 Bank References:

<< >>

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

<< >>

§ 4.3.2 Name and address of agent:

<< >>

§ 5 FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

« »

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

« »

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

« »

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

« »

§ 6 SIGNATURE

§ 6.1 Dated at this « » day of « » « »

Name of Organization: « »

By: « »

Title: « »

§ 6.2

« »

M « » being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this « » day of « » « »

Notary Public: « »

My Commission Expires: « »

SECTION 00500

AGREEMENT FORM

The Department of Administration Office of Purchase Agreement Between Owner and Contractor, and as amended, forms the basis of Contract between the Owner and Contractor, and is an integral part of the Bid Documents.

The Document may be viewed in its entirety at the Rhode Island Building Commissioner's Office, located at One Capitol Hill, Providence, RI 02908

END OF SECTION

DRAFT AIA® Document A101™ - 2007

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the « » day of « » in the year « »
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

« »
« »
« »
« »

and the Contractor:
(Name, legal status, address and other information)

« »
« »
« »
« »

for the following Project:
(Name, location and detailed description)

«HVAC Upgrade, FMS 3 Warwick Armory»
« 541 Airport Rd. Warwick, RI 02886 »
«

The Architect:
(Name, legal status, address and other information)

« »
« »
« »
« »

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201™-2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ELECTRONIC COPYING of any portion of this AIA® Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS**
- 2 THE WORK OF THIS CONTRACT**
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION**
- 4 CONTRACT SUM**
- 5 PAYMENTS**
- 6 DISPUTE RESOLUTION**
- 7 TERMINATION OR SUSPENSION**
- 8 MISCELLANEOUS PROVISIONS**
- 9 ENUMERATION OF CONTRACT DOCUMENTS**
- 10 INSURANCE AND BONDS**

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

« »

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

« »

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than « » (« ») days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

« »

Portion of Work

Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

<< >>

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be << >> (\$ << >>), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

<< >>

§ 4.3 Unit prices, if any:

(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item

Units and Limitations

Price Per Unit (\$0.00)

§ 4.4 Allowances included in the Contract Sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

Item

Price

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

<< >>

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the << >> day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the << >> day of the << >> month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than << >> (<< >>) days after the Architect receives the Application for Payment. (Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

- .1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of « » percent (« » %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction;
- .2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of « » percent (« » %);
- .3 Subtract the aggregate of previous payments made by the Owner; and
- .4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

- .1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)
- .2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:

(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

« »

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

« »

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 INITIAL DECISION MAKER

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker. *(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

<< >>
<< >>
<< >>
<< >>

§ 6.2 BINDING DISPUTE RESOLUTION

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows: *(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)*

- Arbitration pursuant to Section 15.4 of AIA Document A201–2007
- Litigation in a court of competent jurisdiction
- Other *(Specify)*
-

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

<< >> % << >>

§ 8.3 The Owner’s representative:
(Name, address and other information)

<< >>
<< >>
<< >>
<< >>
<< >>
<< >>

§ 8.4 The Contractor’s representative:
(Name, address and other information)

<< >>
<< >>
<< >>
<< >>
<< >>
<< >>

§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

<< >>

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101-2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201-2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:

(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

<< >>

Section	Title	Date	Pages

§ 9.1.5 The Drawings:

(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

<< >>

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

- .1 AIA Document E201™-2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

<< >>

- 2 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor’s bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

<< >>

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)

Type of insurance or bond	Limit of liability or bond amount (\$0.00)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

<< >><< >>

(Printed name and title)

CONTRACTOR *(Signature)*

<< >><< >>

(Printed name and title)

SECTION 00600

PAYMENT AND PERFORMANCE BONDS

1. PERFORMANCE BOND

AIA Document A312 – Performance Bond – December 2010 Edition is an integral part of the Bid Documents, and issues of this form or acceptable facsimile, signed and executed by the successful Bidder and Surety, will be bound into the executed Contract.

2. PAYMENT BOND

AIA Document A312 – Payment Bond – December 2010 Edition is an integral part of the Bid Documents, and issues of this form or acceptable facsimile, signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual.

The Document maybe viewed in its entirety at the Rhode Island Building Commissioner’s Office, located at One Capitol Hill, Providence, RI 02908.

END OF SECTION

DRAFT AIA[®] Document A312[™] - 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

« »
« »

SURETY:

(Name, legal status and principal place of business)

« »
« »

OWNER:

(Name, legal status and address)

« »
« »

CONSTRUCTION CONTRACT

Date: « »

Amount: \$ « »

Description:

(Name and location)

«HVAC Upgrade, FMS 3 Warwick Armory»
« 541 Airport Road, Warwick, RI 02886 »

BOND

Date:

(Not earlier than Construction Contract Date)

« »

Amount: \$ « »

Modifications to this Bond: « » None « » See Section 16

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

SURETY

Company: (Corporate Seal)

Signature:

Name and « »

Title:

(Any additional signatures appear on the last page of this Performance Bond.)

Signature:

Name and « »

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

« »
« »
« »

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

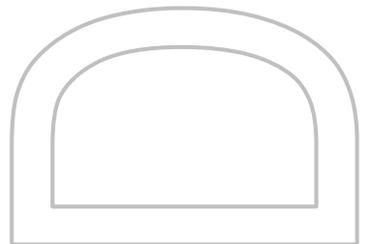
« »
« »
« »
« »
« »
« »

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.



ELECTRONIC COPYING of any portion of this AIA[®] Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 **Balance of the Contract Price.** The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 **Construction Contract.** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 **Contractor Default.** Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 **Owner Default.** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 **Contract Documents.** All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

<< >>

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

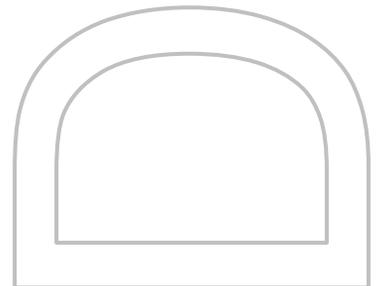
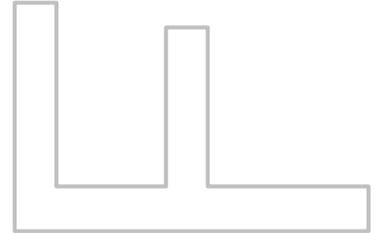
Company: _____ (Corporate Seal)

Signature: _____
Name and Title: << >><< >>
Address: << >>

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: << >><< >>
Address: << >>



DRAFT AIA[®] Document A312[™] - 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

« »
« »

SURETY:

(Name, legal status and principal place of business)

« »
« »

OWNER:

(Name, legal status and address)

« »
« »

CONSTRUCTION CONTRACT

Date: « »

Amount: \$ « »

Description:

(Name and location)

«HVAC Upgrade, FMS 3 Warwick Armory»
« 541 Airport Rd., Warwick, RI02886 »

BOND

Date:

(Not earlier than Construction Contract Date)

« »

Amount: \$ « »

Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

SURETY

Company: (Corporate Seal)

Signature:

Name and « »

Title:

(Any additional signatures appear on the last page of this Payment Bond.)

Signature:

Name and « »

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

« »
« »
« »

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

« »
« »
« »
« »
« »
« »

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

ELECTRONIC COPYING of any portion of this AIA[®] Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1** have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2** have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

<< >>

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: << >><< >>
Address: << >>

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: << >><< >>
Address: << >>

SECTION 00640

WAIVER OF LIEN FORM

Document Waiver of Lien Form is included, following this page, as an integral part of the Contract Documents. A copy with completed information must be submitted with the second, and each additional, Application for Payment.

END OF SECTION

WAIVER OF LIEN FORM

Material or Labor

Construction Project: _____

General Contractor: _____

Subcontractor/supplier: _____

Application and Certificate for Payment Number: _____
(prior to Application No. accompanying this Form)

Schedule of Values ITEM NO.: _____

DESCRIPTION OF WORK heading: _____

Total Payment Received, Including Current Payment: _____

Total Percentage Paid, Including Current Payment: _____

The undersigned Representative of the above Subcontractor/supplier has been contracted by the above General Contractor to furnish labor or materials, or both, as included in the approved Schedule of Values under the above line ITEM NO. and DESCRIPTION OF WORK heading, for the above Construction Project.

The undersigned acknowledges receipt of payment, under this line ITEM NO. and DESCRIPTION OF WORK heading, and hereby waives and releases any and all lien, or claim or right of lien, on the above Construction Project and premises under the statutes of the State of Rhode Island, relating to Mechanics Liens, on account of labor or materials, or both, furnished, or which may be furnished, by the undersigned to, or on account of, the above numbered Application and Certificate for Payment.

Signed on this _____ day of _____, 2_____ .

(Signature)

(Firm Name)

END OF SECTION

SECTION 00700

GENERAL CONDITIONS

AIA Document A201 – General Conditions of the Contract for Construction – 1997 Edition, and the Rhode Island Office of Purchases – Supplementary General Conditions, section 00800, are integral parts of the Bid Documents.

The Document may be viewed in its entirety at the Rhode Island Building Commissioner's Office, located at One Capitol Hill, Providence, RI, 02908.

END OF SECTION

DRAFT AIA[®] Document A201[™] - 2007

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

«HVAC Upgrade, FMS 3 Warwick Armory»
« 541 Airport Road, Warwick, RI 02886 »

THE OWNER:

(Name, legal status and address)

« »
« »

THE ARCHITECT:

(Name, legal status and address)

« »
« »

TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 OWNER
- 3 CONTRACTOR
- 4 ARCHITECT
- 5 SUBCONTRACTORS
- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
- 7 CHANGES IN THE WORK
- 8 TIME
- 9 PAYMENTS AND COMPLETION
- 10 PROTECTION OF PERSONS AND PROPERTY
- 11 INSURANCE AND BONDS
- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS
- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

ELECTRONIC COPYING of any portion of this AIA[®] Document to another electronic file is prohibited and constitutes a violation of copyright laws as set forth in the footer of this document.

INDEX

(Topics and numbers in bold are section headings.)

Acceptance of Nonconforming Work

9.6.6, 9.9.3, **12.3**

Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, **12.3**

Access to Work

3.16, 6.2.1, 12.1

Accident Prevention

10

Acts and Omissions

3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.4.2, 13.7, 14.1, 15.2

Addenda

1.1.1, 3.11.1

Additional Costs, Claims for

3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4

Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, **13.5**

Additional Insured

11.1.4

Additional Time, Claims for

3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.5**

Administration of the Contract

3.1.3, **4.2**, 9.4, 9.5

Advertisement or Invitation to Bid

1.1.1

Aesthetic Effect

4.2.13

Allowances

3.8, 7.3.8

All-risk Insurance

11.3.1, 11.3.1.1

Applications for Payment

4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.6.3, 9.7, 9.10,

11.1.3

Approvals

2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10,

4.2.7, 9.3.2, 13.5.1

Arbitration

8.3.1, 11.3.10, 13.1.1, 15.3.2, **15.4**

ARCHITECT

4

Architect, Definition of

4.1.1

Architect, Extent of Authority

2.4.1, 3.12.7, 4.1, 4.2, 5.2, 6.3, 7.1.2, 7.3.7, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1

Architect, Limitations of Authority and Responsibility

2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.3, 9.6.4, 15.1.3, 15.2

Architect's Additional Services and Expenses

2.4.1, 11.3.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4

Architect's Administration of the Contract

3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 9.5

Architect's Approvals

2.4.1, 3.1.3, 3.5, 3.10.2, 4.2.7

Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

Architect's Copyright

1.1.7, 1.5

Architect's Decisions

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.5.2, 15.2, 15.3

Architect's Inspections

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.5

Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2

Architect's Interpretations

4.2.11, 4.2.12

Architect's Project Representative

4.2.10

Architect's Relationship with Contractor

1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.4.2, 13.5, 15.2

Architect's Relationship with Subcontractors

1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3.7

Architect's Representations

9.4.2, 9.5.1, 9.10.1

Architect's Site Visits

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5

Asbestos

10.3.1

Attorneys' Fees

3.18.1, 9.10.2, 10.3.3

Award of Separate Contracts

6.1.1, 6.1.2

Award of Subcontracts and Other Contracts for Portions of the Work

5.2

Basic Definitions

1.1

Bidding Requirements

1.1.1, 5.2.1, 11.4.1

Binding Dispute Resolution

9.7, 11.3.9, 11.3.10, 13.1.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1

Boiler and Machinery Insurance

11.3.2

Bonds, Lien

7.3.7.4, 9.10.2, 9.10.3

Bonds, Performance, and Payment

7.3.7.4, 9.6.7, 9.10.3, 11.3.9, **11.4**

Building Permit

3.7.1

Capitalization

1.3

Certificate of Substantial Completion

9.8.3, 9.8.4, 9.8.5

Certificates for Payment

4.2.1, 4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7,

9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.3

Certificates of Inspection, Testing or Approval

13.5.4

Certificates of Insurance

9.10.2, 11.1.3

Change Orders

1.1.1, 2.4.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11.1, 3.12.8, 4.2.8,

5.2.3, 7.1.2, 7.1.3, **7.2**, 7.3.2, 7.3.6, 7.3.9, 7.3.10,

8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9,

12.1.2, 15.1.3

Change Orders, Definition of

7.2.1

CHANGES IN THE WORK

2.2.1, 3.11, 4.2.8, **7**, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1,

11.3.9

Claims, Definition of

15.1.1

CLAIMS AND DISPUTES

3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4

Claims and Timely Assertion of Claims

15.4.1

Claims for Additional Cost

3.2.4, 3.7.4, 6.1.1, 7.3.9, 10.3.2, **15.1.4**

Claims for Additional Time

3.2.4, 3.7.4.6.1.1, 8.3.2, 10.3.2, **15.1.5**

Concealed or Unknown Conditions, Claims for

3.7.4

Claims for Damages

3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1,

11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6

Claims Subject to Arbitration

15.3.1, 15.4.1

Cleaning Up

3.15, 6.3

Commencement of the Work, Conditions Relating to

2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3,

6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.3.1, 11.3.6, 11.4.1,

15.1.4

Commencement of the Work, Definition of

8.1.2

Communications Facilitating Contract

Administration

3.9.1, **4.2.4**

Completion, Conditions Relating to

3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1,

9.10, 12.2, 13.7, 14.1.2

COMPLETION, PAYMENTS AND

9

Completion, Substantial

4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3,

12.2, 13.7

Compliance with Laws

1.6.1, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4,

10.2.2, 11.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6,

14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions

3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract

1.1.1, 6.1.1, 6.1.4

Consent, Written

3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1,

9.10.2, 9.10.3, 11.3.1, 13.2, 13.4.2, 15.4.4.2

Consolidation or Joinder

15.4.4

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

1.1.4, **6**

Construction Change Directive, Definition of

7.3.1

Construction Change Directives

1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**,

9.3.1.1

Construction Schedules, Contractor's

3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2

Contingent Assignment of Subcontracts

5.4, 14.2.2.2

Continuing Contract Performance

15.1.3

Contract, Definition of

1.1.2

CONTRACT, TERMINATION OR SUSPENSION OF THE

5.4.1.1, 11.3.9, **14**

Contract Administration

3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating

to

3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1

Contract Documents, Copies Furnished and Use of

1.5.2, 2.2.5, 5.3

Contract Documents, Definition of

1.1.1

Contract Sum

3.7.4, 3.8, 5.2.3, 7.2, 7.3, 7.4, **9.1**, 9.4.2, 9.5.1.4,

9.6.7, 9.7, 10.3.2, 11.3.1, 14.2.4, 14.3.2, 15.1.4,

15.2.5

Contract Sum, Definition of

9.1

Contract Time

3.7.4, 3.7.5, 3.10.2, 5.2.3, 7.2.1.3, 7.3.1, 7.3.5, 7.4,

8.1.1, 8.2.1, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 14.3.2,

15.1.5.1, 15.2.5

Contract Time, Definition of

8.1.1

CONTRACTOR

3

Contractor, Definition of

3.1, 6.1.2

Contractor's Construction Schedules

3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2

Contractor's Employees

3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1

Contractor's Liability Insurance

11.1

Contractor's Relationship with Separate Contractors and Owner's Forces

3.12.5, 3.14.2, 4.2.4, 6, 11.3.7, 12.1.2, 12.2.4

Contractor's Relationship with Subcontractors

1.2.2, 3.3.2, 3.18.1, 3.18.2, 5, 9.6.2, 9.6.7, 9.10.2, 11.3.1.2, 11.3.7, 11.3.8

Contractor's Relationship with the Architect

1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.5, 15.1.2, 15.2.1

Contractor's Representations

3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2

Contractor's Responsibility for Those Performing the Work

3.3.2, 3.18, 5.3.1, 6.1.3, 6.2, 9.5.1, 10.2.8

Contractor's Review of Contract Documents

3.2

Contractor's Right to Stop the Work

9.7

Contractor's Right to Terminate the Contract

14.1, 15.1.6

Contractor's Submittals

3.10, 3.11, 3.12.4, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2

Contractor's Superintendent

3.9, 10.2.6

Contractor's Supervision and Construction

Procedures

1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3

Contractual Liability Insurance

11.1.1.8, 11.2

Coordination and Correlation

1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1

Copies Furnished of Drawings and Specifications

1.5, 2.2.5, 3.11

Copyrights

1.5, 3.17

Correction of Work

2.3, 2.4, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2

Correlation and Intent of the Contract Documents

1.2

Cost, Definition of

7.3.7

Costs

2.4.1, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.7, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.3, 12.1.2, 12.2.1, 12.2.4, 13.5, 14

Cutting and Patching

3.14, 6.2.5

Damage to Construction of Owner or Separate Contractors

3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3, 12.2.4

Damage to the Work

3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4.1, 11.3.1, 12.2.4

Damages, Claims for

3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6

Damages for Delay

6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2

Date of Commencement of the Work, Definition of

8.1.2

Date of Substantial Completion, Definition of

8.1.3

Day, Definition of

8.1.4

Decisions of the Architect

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 15.2, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.5.2, 14.2.2, 14.2.4, 15.1, 15.2

Decisions to Withhold Certification

9.4.1, 9.5, 9.7, 14.1.1.3

Defective or Nonconforming Work, Acceptance, Rejection and Correction of

2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.5, 9.5.1, 9.5.2, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1

Definitions

1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 15.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1

Delays and Extensions of Time

3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5

Disputes

6.3, 7.3.9, 15.1, 15.2

Documents and Samples at the Site

3.11

Drawings, Definition of

1.1.5

Drawings and Specifications, Use and Ownership of

3.11

Effective Date of Insurance

8.2.2, 11.1.2

Emergencies

10.4, 14.1.1.2, 15.1.4

Employees, Contractor's

3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1

Equipment, Labor, Materials or
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13.1, 3.15.1,
4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3,
9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5,
3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2,
9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2,
10.4.1, 14.3, 15.1.5, 15.2.5
Failure of Payment
9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2
Faulty Work
(See Defective or Nonconforming Work)
Final Completion and Final Payment
4.2.1, 4.2.9, 9.8.2, **9.10**, 11.1.2, 11.1.3, 11.3.1, 11.3.5,
12.3.1, 14.2.4, 14.4.3
Financial Arrangements, Owner's
2.2.1, 13.2.2, 14.1.1.4
Fire and Extended Coverage Insurance
11.3.1.1
GENERAL PROVISIONS
1
Governing Law
13.1
Guarantees (See Warranty)
Hazardous Materials
10.2.4, **10.3**
Identification of Subcontractors and Suppliers
5.2.1
Indemnification
3.17, **3.18**, 9.10.2, 10.3.3, 10.3.5, 10.3.6, 11.3.1.2,
11.3.7
Information and Services Required of the Owner
2.1.2, **2.2**, 3.2.2, 3.12.4, 3.12.10, 6.1.3, 6.1.4, 6.2.5,
9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.4, 13.5.1,
13.5.2, 14.1.1.4, 14.1.4, 15.1.3
Initial Decision
15.2
Initial Decision Maker, Definition of
1.1.8
Initial Decision Maker, Decisions
14.2.2, 14.2.4, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
Initial Decision Maker, Extent of Authority
14.2.2, 14.2.4, 15.1.3, 15.2.1, 15.2.2, 15.2.3, 15.2.4,
15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4.1
Inspections
3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
9.9.2, 9.10.1, 12.2.1, 13.5
Instructions to Bidders
1.1.1
Instructions to the Contractor
3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.5.2

Instruments of Service, Definition of
1.1.7
Insurance
3.18.1, 6.1.1, 7.3.7, 9.3.2, 9.8.4, 9.9.1, 9.10.2, **11**
Insurance, Boiler and Machinery
11.3.2
Insurance, Contractor's Liability
11.1
Insurance, Effective Date of
8.2.2, 11.1.2
Insurance, Loss of Use
11.3.3
Insurance, Owner's Liability
11.2
Insurance, Property
10.2.5, **11.3**
Insurance, Stored Materials
9.3.2
INSURANCE AND BONDS
11
Insurance Companies, Consent to Partial Occupancy
9.9.1
Intent of the Contract Documents
1.2.1, 4.2.7, 4.2.12, 4.2.13, 7.4
Interest
13.6
Interpretation
1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1
Interpretations, Written
4.2.11, 4.2.12, 15.1.4
Judgment on Final Award
15.4.2
Labor and Materials, Equipment
1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3,
9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Labor Disputes
8.3.1
Laws and Regulations
1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13.1, 4.1.1, 9.6.4, 9.9.1,
10.2.2, 11.1.1, 11.3, 13.1.1, 13.4, 13.5.1, 13.5.2,
13.6.1, 14, 15.2.8, 15.4
Liens
2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8
Limitations, Statutes of
12.2.5, 13.7, 15.4.1.1
Limitations of Liability
2.3.1, 3.2.2, 3.5, 3.12.10, 3.17, 3.18.1, 4.2.6, 4.2.7,
4.2.12, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 10.2.5, 10.3.3,
11.1.2, 11.2, 11.3.7, 12.2.5, 13.4.2
Limitations of Time
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,
5.2, 5.3.1, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 11.3.1.5,
11.3.6, 11.3.10, 12.2, 13.5, 13.7, 14, 15
Loss of Use Insurance
11.3.3

Material Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.6, 9.10.5

Materials, Hazardous
10.2.4, **10.3**

Materials, Labor, Equipment and
1.1.3, 1.1.6, 1.5.1, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12,
3.13.1, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2,
9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1,
14.2.1.2

Means, Methods, Techniques, Sequences and
Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2

Mechanic's Lien
2.1.2, 15.2.8

Mediation
8.3.1, 10.3.5, 10.3.6, 15.2.1, 15.2.5, 15.2.6, **15.3**,
15.4.1

Minor Changes in the Work
1.1.1, 3.12.8, 4.2.8, 7.1, **7.4**

MISCELLANEOUS PROVISIONS

13

Modifications, Definition of

1.1.1

Modifications to the Contract
1.1.1, 1.1.2, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7,
10.3.2, 11.3.1

Mutual Responsibility

6.2

Nonconforming Work, Acceptance of

9.6.6, 9.9.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3,
9.10.4, 12.2.1

Notice

2.2.1, 2.3.1, 2.4.1, 3.2.4, 3.3.1, 3.7.2, 3.12.9, 5.2.1,
9.7, 9.10, 10.2.2, 11.1.3, 12.2.2.1, 13.3, 13.5.1,
13.5.2, 14.1, 14.2, 15.2.8, 15.4.1

Notice, Written

2.3.1, 2.4.1, 3.3.1, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 9.7,
9.10, 10.2.2, 10.3, 11.1.3, 11.3.6, 12.2.2.1, **13.3**, 14,
15.2.8, 15.4.1

Notice of Claims

3.7.4, 10.2.8, **15.1.2**, 15.4

Notice of Testing and Inspections

13.5.1, 13.5.2

Observations, Contractor's

3.2, 3.7.4

Occupancy

2.2.2, 9.6.6, 9.8, 11.3.1.5

Orders, Written

1.1.1, 2.3, 3.9.2, 7, 8.2.2, 11.3.9, 12.1, 12.2.2.1,
13.5.2, 14.3.1

OWNER

2

Owner, Definition of

2.1.1

Owner, Information and Services Required of the

2.1.2, **2.2**, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2,
9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.3, 13.5.1,
13.5.2, 14.1.1.4, 14.1.4, 15.1.3

Owner's Authority

1.5, 2.1.1, 2.3.1, 2.4.1, 3.4.2, 3.8.1, 3.12.10, 3.14.2,
4.1.2, 4.1.3, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3,
7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.1, 9.3.2, 9.5.1, 9.6.4,
9.9.1, 9.10.2, 10.3.2, 11.1.3, 11.3.3, 11.3.10, 12.2.2,
12.3.1, 13.2.2, 14.3, 14.4, 15.2.7

Owner's Financial Capability

2.2.1, 13.2.2, 14.1.1.4

Owner's Liability Insurance

11.2

Owner's Relationship with Subcontractors

1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

Owner's Right to Carry Out the Work

2.4, 14.2.2

Owner's Right to Clean Up

6.3

**Owner's Right to Perform Construction and to
Award Separate Contracts**

6.1

Owner's Right to Stop the Work

2.3

Owner's Right to Suspend the Work

14.3

Owner's Right to Terminate the Contract

14.2

**Ownership and Use of Drawings, Specifications
and Other Instruments of Service**

1.1.1, 1.1.6, 1.1.7, **1.5**, 2.2.5, 3.2.2, 3.11.1, 3.17,
4.2.12, 5.3.1

Partial Occupancy or Use

9.6.6, **9.9**, 11.3.1.5

Patching, Cutting and

3.14, 6.2.5

Patents

3.17

Payment, Applications for

4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1,
14.2.3, 14.2.4, 14.4.3

Payment, Certificates for

4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1,
9.10.3, 13.7, 14.1.1.3, 14.2.4

Payment, Failure of

9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2

Payment, Final

4.2.1, 4.2.9, 9.8.2, 9.10, 11.1.2, 11.1.3, 11.4.1, 12.3.1,
13.7, 14.2.4, 14.4.3

Payment Bond, Performance Bond and

7.3.7.4, 9.6.7, 9.10.3, **11.4**

Payments, Progress

9.3, **9.6**, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3

PAYMENTS AND COMPLETION

9

Payments to Subcontractors
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
PCB
10.3.1
Performance Bond and Payment Bond
7.3.7.4, 9.6.7, 9.10.3, 11.4
Permits, Fees, Notices and Compliance with Laws
2.2.2, 3.7, 3.13, 7.3.7.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF
10
Polychlorinated Biphenyl
10.3.1
Product Data, Definition of
3.12.2
Product Data and Samples, Shop Drawings
3.11, 3.12, 4.2.7
Progress and Completion
4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.3
Progress Payments
9.3, 9.6, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3
Project, Definition of
1.1.4
Project Representatives
4.2.10
Property Insurance
10.2.5, 11.3
PROTECTION OF PERSONS AND PROPERTY
10
Regulations and Laws
1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1,
10.2.2, 11.1, 11.4, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14,
15.2.8, 15.4
Rejection of Work
3.5, 4.2.6, 12.2.1
Releases and Waivers of Liens
9.10.2
Representations
3.2.1, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.4.2, 9.5.1,
9.8.2, 9.10.1
Representatives
2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.1, 4.2.2, 4.2.10, 5.1.1,
5.1.2, 13.2.1
Responsibility for Those Performing the Work
3.3.2, 3.18, 4.2.3, 5.3.1, 6.1.3, 6.2, 6.3, 9.5.1, 10
Retainage
9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor
3.2, 3.12.7, 6.1.3
Review of Contractor's Submittals by Owner and Architect
3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
Review of Shop Drawings, Product Data and Samples by Contractor
3.12

Rights and Remedies
1.1.2, 2.3, 2.4, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1,
6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.2, 12.2.4,
13.4, 14, 15.4
Royalties, Patents and Copyrights
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.3.1, 4.2.2, 4.2.7, 5.3.1, **10.1, 10.2, 10.4**
Samples, Definition of
3.12.3
Samples, Shop Drawings, Product Data and
3.11, 3.12, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Shop Drawings, Definition of
3.12.1
Shop Drawings, Product Data and Samples
3.11, 3.12, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.4.2, 9.10.1, 13.5
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5
Special Inspections and Testing
4.2.6, 12.2.1, 13.5
Specifications, Definition of
1.1.6
Specifications
1.1.1, **1.1.6, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14**
Statute of Limitations
13.7, 15.4.1.1
Stopping the Work
2.3, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2,
9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1

Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3,
9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, **11.3.7**
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3,
12.2, 13.7
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
4.1.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8
Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4,
7.1.3, 7.3.7, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.3
Surety
5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7
Surety, Consent of
9.10.2, 9.10.3
Surveys
2.2.3
Suspension by the Owner for Convenience
14.3
Suspension of the Work
5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14
Taxes
3.6, 3.8.2.1, 7.3.7.4
Termination by the Contractor
14.1, 15.1.6
Termination by the Owner for Cause
5.4.1.1, **14.2**, 15.1.6
Termination by the Owner for Convenience
14.4
Termination of the Architect
4.1.3
Termination of the Contractor
14.2.2
TERMINATION OR SUSPENSION OF THE
CONTRACT
14

Tests and Inspections
3.1.3, 3.3.3, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2,
9.10.1, 10.3.2, 11.4.1.1, 12.2.1, **13.5**
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7,
10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Time Limits
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,
5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 12.2, 13.5,
13.7, 14, 15.1.2, 15.4
Time Limits on Claims
3.7.4, 10.2.8, **13.7**, 15.1.2
Title to Work
9.3.2, 9.3.3
Transmission of Data in Digital Form
1.6
UNCOVERING AND CORRECTION OF
WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 7.3.4
Use of Documents
1.1.1, 1.5, 2.2.5, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.4.2
Waiver of Claims by the Contractor
9.10.5, 13.4.2, 15.1.6
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.4.2, 14.2.4, 15.1.6
Waiver of Consequential Damages
14.2.4, 15.1.6
Waiver of Liens
9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, **11.3.7**
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2, 13.7
Weather Delays
15.1.5.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5,
9.9.1, 9.10.2, 9.10.3, 11.4.1, 13.2, 13.4.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12

Written Notice

2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 12.2.2, 12.2.4, **13.3**, 14, 15.4.1

Written Orders

1.1.1, 2.3, 3.9, 7, 8.2.2, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2



ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect’s consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect’s or Architect’s consultants’ reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect’s consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic’s lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner’s interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or

the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other

facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume

the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1** Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3** Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be

required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may

be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

- .1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;
- .2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
- .5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect,

stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the

Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction

of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or

otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the

Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an

additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.



SECTION 00800

SUPPLEMENTARY GENERAL CONDITIONS

The following supplements modify the “General Conditions of the Contract for construction,” AIA Document A201, 1997 Edition. Where a portion of the General Conditions is modified or deleted by these supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ARTICLE 1 – GENERAL PROVISIONS

Add the following sub-paragraphs to 1.1:

1.1.8 Miscellaneous Definitions

1.1.8.1 The term “product” includes materials, systems, and equipment.

1.1.8.2 Where “as directed,” “as permitted,” “as required,” “approved,” “accepted,” or words of similar import are used, it shall be understood that the direction, requirement, permission, approval, or acceptance of the Engineer is intended, unless stated otherwise. As used herein, “provide” shall be understood to mean “provide complete in place” that is, “furnish and install.”

1.2 Execution, Correlation and Intent

Add the following Clause 1.2.3.1 to 1.2.3:

1.2.3.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities:

1. The agreement
2. Addenda, with those of a later date having precedence over those of an earlier date.
3. The supplementary Conditions.
4. The General Conditions of the Contract for Construction
5. Specifications (in the case of an inconsistency in the specifications or within the Document not clarified by Addendum) the better quality or greater quantity of Work shall be provided in accordance with the Engineer’s interpretation.

Add the following subparagraph 1.2.4:

1.2.4 Sections of Division 1 – General Requirements – govern the execution of all Sections of the Specifications.

ARTICLE 2 – OWNER

2.2 Information and Services Required of the Owner

Delete subparagraph 2.2.1.

2.2.3 Delete subparagraph 2.2.3 and substitute the following:

2.2.3 The Contractor shall secure and pay for permits and fees, and necessary approvals, easements, assessments, and charges required for construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

Delete subparagraph 2.2.5 in its entirety; no substitution.

ARTICLE 3 – CONTRACTOR

3.2 Review of Contract Documents and Field Conditions by Contractor.

Add the following subparagraph to 3.2:

3.2.4 Lack of indications in the specifications of items obviously needed to properly perform the Work of the project such as attachments, bolts, hangers, and other fastening devices, shall not relieve the Contractor from furnishing and installing these items.

3.2.5 Should an inconsistency (or discrepancy) be found in the Contract documents not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Engineer's interpretation.

3.4 Labor and Materials

Add the following subparagraphs 2.4.3 and 3.4.4 to 3.4:

3.4.3 After the Contract has been executed, the Owner and the Engineer will consider a formal request for the substitution of products in the place of those specified only under conditions set forth in the General Requirements (Division 1 or the Specifications) and in Article 7 of this Document.

3.4.4 By making requests for substitutions based on subparagraph 3.4.3 above, the Contractor:

- .1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 Certifies that the cost data presented is complete and includes all related costs under this Contract but excludes costs under separate contracts, and excludes the Engineer's redesign costs related to the substitution which subsequently became apparent; and
- .4 Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

3.6 Taxes

Delete subparagraph 3.6.1 and substitute the following:

3.6.1 The Owner is exempt from payment of sales taxes for materials directly incorporated into the Work of this Project. Refer to requirements set forth in the General Requirements (Division 1 of the Specifications).

3.7 Permits, Fees, and Notices

Add to subparagraph 3.7.1:

- .1 Contact the Rhode Island State building Commissioner's Office to determine the amount of permits, costs, and associated fees or surcharges.

ARTICLE 7 – CHANGES IN THE WORK

7.3 Construction Change Directives

Delete subparagraph 7.3.6 and substitute the following:

- 7.3.6 If a cost is not previously agreed upon, then the Contractor, provided he receives a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such work shall then be determined by the Engineer on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including in the case of an increase in the Contract sum, and allowance for overhead and profit as hereinafter stipulated. In such case, the Contractor shall keep and present, in such form as the Engineer may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Pending final determination of cost to the Owner, payments on account shall be made on the architect's Certificate for Payment.

Add the following subparagraph to 7.3:

- 7.3.10 In subparagraph 7.3.3 and 7.3.6, the allowance for overhead and profit combined included in the total cost to the Owner shall be based on the following schedule:
- .1 For the Contractor, for Work performed by the Contractor's own forces, ten percent of the cost.
 - .2 For the Contractor, for Work performed by the Contractor's Subcontractor, six percent of the amount due the Subcontractor.
 - .3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's own forces, ten percent of the cost.
 - .4 For each subcontractor, for work performed by the Subcontractor's Sub-subcontractors, six percent of the amount due the Subcontractor.
 - .5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.11.
 - .6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspections, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change over \$50 be approved without such itemization.
- 7.3.11 Cost, as referred to throughout this Article (7), shall be limited to the following; cost of materials, including cost of delivery; cost of labor, including social Security, old age and unemployment insurance, and fringe benefits required by agreement or custom; worker's or workmen's compensation insurance; rental value of tools, equipment, and machinery.

- 7.3.12 Overhead, as referred to within this Article (7), shall include the following: bond premiums, insurance premiums, supervision, superintendence, wages of time-keepers, watchmen and clerks, small tools, incidentals, general office expense, and all other expenses not included in “Cost.”
- 7.3.13 The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract sum will be in the amount of the actual net cost as confirmed by the Engineer. When both additions and credits covering related Work of substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.
- 7.3.14 Subsequent to the approval of a Change Order, whether involving a change in Contract sum, Contract time, or both, no additional claim related to that matter will be considered by the Owner. A change incorporated into a Change Order is therefore all inclusive, and includes such factors as project impact, schedule, “ripple” effect, or other items which may pertain to such changes.

ARTICLE 8 – TIME

8.3 Delays and Extensions of Time

Add not subparagraph:

- 8.3.4 Landscape work and corresponding seasonally limited work may be scheduled for later completion, as mutually agreed upon, and completed under approved working conditions.

ARTICLE 9 – PAYMENTS AND COMPLETION

9.3 Application for Payment

Add the following sentences to subparagraph 9.3.1:

The form of application for Payment shall be a notarized AIA Document G702, application and Certification for Payment, supported by AIA Document G703, Continuation sheet.

Delete clause 9.3.1.1

9.4 Certificate for Payment

Add the following new subparagraphs:

- 9.4.3 First Certificate for Payment – The Engineer will process this Certificate only after he has received:

- 1) Certification that the Contractor is currently maintaining Record Drawings
- 2) Release of Liens
- 3) Certification of foundation and building layout survey data is specified in Section 01010

- 4) All the proposed material and color samples have been submitted for the Engineer's approval and the color selections. Certification as to maintenance of Record Drawings and Release of Liens will accompany all subsequent applications; otherwise the Engineer will not process the respective Certificate for Payment.

9.5 Decisions to Withhold Certification

Add the following clause .8 to 9.5.1:

- .8 Failure to maintain as current, "Record Drawings."

9.6 Progress Payments

Add the following subparagraph 9.6.1:

- 9.6.1 Based upon applications for Payment submitted to the Engineer by the Contractor and Certificates for Payment issued by the Engineer, the Owner shall make progress payments on account of the Contract sum to the Contractor as provided in the Contract Documents for the period ending the last day of the month as follows:

Payments shall be made not more than once per month. Ninety percent (90%) of the portion of the Contract sum properly allocable to labor, materials, and equipment incorporated in the Work and ninety percent (90%) of the portion of the Contract sum properly allocable to materials and equipment suitable stored at the site or at some other location agreed upon in writing, for the period covered by the application for Payment, less the aggregate of previous payments made by the Owner; and upon Substantial Completion of the entire work, a sum sufficient to increase the total payments to ninety-seven percent (97%) of the Contract sum, less such amounts as the Engineer shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents. If, in the opinion of the Engineer, the Work progresses satisfactorily after fifty percent (50%) of the Work is completed, the Engineer may recommend to the Owner that the retainage be decreased to five percent (5%). Such reduction shall occur upon the Owner's approval and after receipt of AIA Documents G707A (Consent of Surety to Reduction).

Add the following clause 9.6.1.1 to 9.6.1:

- 9.6.1.1 The Owner reserves the right to withhold payment to the Contractor, in whole or in part, for any or all of the reasons cited in clauses 9.5.1.1 through 9.5.1.8.

9.8 Substantial Completion

Add the following sentence to subparagraph 9.8.4:

The payment shall be sufficient to maintain, or increase, the total payments to ninety-seven percent (97%) of the Contract sum, less such amounts as the Engineer shall determine for incomplete Work and unsettled claims.

Add the following sentence to subparagraph 9.8.4:

Prior to the issuance of a Certificate of Substantial Completion, and in addition to the requirements herein, the Contractor and his subcontractors shall submit:

- 1) Their respective certificates of contract document compliance.
- 2) Warranties and guarantees.
- 3) Bonds.
- 4) Certificates and affidavits.
- 5) Operating manuals.
- 6) Project record documents including record drawings.
- 7) Extra materials and samples (as specified) required for the Owner.
- 8) Occupancy Permit (if requested).

9.10 Final Completion and Final Payment

9.10.2 Add the following sentence:

Prior to final inspection, and in addition to requirements herein, submit: Contractor's Affidavits (AIA Documents G706 and G706A); and Consent of Surety (AIA Document G707).

Add the following subparagraphs:

- 9.10.5 The Contractor shall submit Release of Lien from all subcontractors and material suppliers indicating payments received from the previous applications. Certificates for Payment will not be processed unless these releases are included therewith.
- 9.10.6 Immediately satisfy a lien or encumbrance which, because of any act or default of the Contractor, is filed against the premises and indemnify and save the Owner harmless against all resulting loss and expenses, including attorney's fees. In addition, moneys due under this Contract, as may be considered necessary by the Owner, may be retained by the Owner until all such suits, claims for damages, or expenses as aforesaid shall have been settled and paid.
- 9.10.7 The statement on the Standard AIA Form G702, Certificates of Payment, which certifies that "all bills are paid for which previous certificates for payment were issued" shall be notarized by a Notary Public currently licensed to practice in the State of Rhode Island.

ARTICLE 11 – INSURANCE AND BONDS

11.1 Contractor's Liability Insurance

11.1.1 In the first line following the work "maintain," insert the words "in a company or companies licensed to do business in the state of Rhode Island."

Add the following clauses 11.1.1.8 and 11.1.1.9 to 11.1.1:

11.1.1.8 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X-C/U as applicable).

Section 00800 - 6

2. Independent Contractor's Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual – including specified provisions for Contractor's obligation under Paragraph 3.18.
6. Owned, non-owned, and hired motor vehicles.
7. Broad Form Property Damage including completed operations including explosion, collapse, and underground.

11.1.1.9 If the General Liability coverages are provided by a General Liability Policy on a claims-made basis, the policy date or retroactive date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with subparagraph 9.10.2.

Add the following clause 11.1.2.1 to 11.1.2:

11.1.2.1 The insurance required by subparagraph 11.1.1 shall be written for not less than the following limits, or great if required by law:

1. Worker's Compensation:
 - a. State: Statutory
 - b. Employer's Liability: \$500,000

2. Comprehensive General Liability (including Premises Operations; Independent Contractor's Protective; Products and Completed Operations; Broad Form Property Damage):
 - a. Bodily Injury:

\$1,000,000	Each Person
\$1,000,000	Each Occurrence
\$1,000,000	Annual Aggregate
 - b. Property Damage:

\$ 500,000	Each Occurrence
\$1,000,000	Annual Aggregate

3. Contractual Liability:
 - a. Bodily Injury:

\$1,000,000	Each Occurrence
-------------	-----------------
 - b. Property Damage:

\$1,000,000	Each Occurrence
\$1,000,000	Annual Aggregate

4. Personal Injury, with Employment Exclusion deleted:

\$1,000,000	Annual Aggregate
-------------	------------------

5. Comprehensive Automobile Liability:
 - a. Bodily Injury

\$ 500,000	Each Person
\$1,000,000	Each Occurrence
 - b. Property Damage:

\$ 500,000	Each Occurrence
------------	-----------------

Add the following clause 11.1.3.1 to 11.1.3:

11.1.3.1 The Contractor shall furnish one copy of each of Certificate of Insurance herein required by subparagraphs 11.1.1, 11.1.2, and 11.1.3. If this insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G705, Certificate of Insurance. If this insurance is written on a Commercial General Liability policy form ACCORD, Form 25S will be acceptable. The Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending coverage or limits.

11.2 Owner's Liability Insurance

Delete the subparagraph 11.2.1 in its entirety and substitute the following subparagraph 11.2.1 to 11.2:

11.2.1 The Contractor shall furnish the Owner, through the Engineer, an insurance certificate providing Owner's Protective Liability extended to include the interests of the Engineer, and to protect the Owner and Engineer from any liability which might be incurred against them as a result of any operation of the Contractor or his subcontractors or their employees. Such insurance shall be written for the same limits as the Contractor's Liability Insurance and shall include the same coverage.

11.4 Property Insurance

Delete subparagraph 11.4.1 in its entirety and substitute the following:

1.4.1 The Contractor shall purchase and maintain property insurance upon the entire Work at the site to the full insurable value thereof. Such insurance shall be in a company or companies against which the Owner has no reasonable objection. This insurance shall include the interests of the Owner, the Contractor, Subcontractors, and sub-subcontractors in the Work and shall insure against the perils of fire and extended coverages and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism, and malicious mischief. If not covered under all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain similar property insurance on portions of the Work stored off the site or in transit when such portions of the work are to be included in an Application for Payment under subparagraph 9.3.2.

Add the following sentence to clause 11.4.1.1:

11.4.1.1 The form of policy for this coverage shall be Completed Value.

11.4.1.2 Delete clause 11.4.1.2.

11.4.1.3 Delete clause 11.4.1.3.

11.4.2 Delete subparagraph 11.4.2.

11.4.3 Delete subparagraph 11.4.3.

11.4.4 Delete subparagraph 11.4.4.

Delete subparagraph 11.4.6 in its entirety and substitute the following:

- 11.4.6 The Contractor shall file two certified copies of all policies with the Owner before exposure to loss can occur. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto. Each policy shall contain a provision that the policy will not be cancelled or allowed to expire until at least 30 days prior written notice has been given to the Contractor.
- 11.4.7 Modify subparagraph 11.4.7 substituting “Contractor” for “Owner” at the end of the first sentence.
- 11.4.8 Modify subparagraph 11.4.8 by substituting “Contractor” for “Owner” as fiduciary; except that at the first reference of “Owner” in the first sentence, the word “this” should be substituted for “Owner’s.”
- 11.4.9 Modify subparagraph 11.4.9 by substituting “Contractor” for “Owner” each time the latter word appears.
- 11.4.10 Modify subparagraph 11.4.10 by substituting “Contractor” for “Owner” each time the latter word appears.
- 11.5 Performance Bond and Payment Bond Performance and Payment Bond

Delete subparagraph 11.5.1 and substitute the following:

- 11.5.1 The Contractor shall deliver the required bonds to the Owner on or before the date the Agreement is entered into.
- 11.5.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 13 – MISCELLANEOUS PROVISIONS

Add the following Paragraph 13.8 to Article 13:

- 13.8 Equal Opportunity
- 13.8.1 The Contractor shall maintain policies or employment as follows:
 - 13.8.1.1 The Contractor and the Contractor’s Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, or national origin.

Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The

Contractor agrees to post in conspicuous places, available to employees and applicants for employment notices setting forth the policies of nondiscrimination.

13.8.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, or national origin.

13.8.1.3 The Contractor shall be a signatory to the requirements of the Rhode Island Equal Employment Office.

Add the following Paragraph 13.9 to Article 13:

13.9 Prevailing Wage Scale on Public Works Projects

13.9.1 In accordance with Chapter 3290 of the General Laws of Rhode Island, 1938, as amended, the Department of Labor determined the customary and prevailing rate of wages paid to crafts persons, teamsters, and laborers in the constructing of public works by the State, and by cities and town, and by persons contracting therewith for such construction. Violators are subject to fines of not more than One Hundred Dollars (\$100) for each offense.

13.9.2 The wage rates as ascertained by the Department of Labor are uniform for the State of Rhode Island and as of the date of advertisement of Contract applying to the life of the Contract. Information concerning wage rates prevailing in the construction industry in Rhode Island may be obtained from the Office of the State Department of Labor, 220 Elmwood Avenue, Providence, Rhode Island. Under no condition shall the wages paid be less than those designated in the general classification. This clause does not relieve the Contractor or his Subcontractors from respecting any other union regulations to which he ordinarily subscribes.

13.9.3 Bulletin No. 3, State Labor Laws, issued by the Rhode Island Department of Labor, pertaining to Public Works Projects (General Laws of Rhode Island, Revision of 1956, Chapter 37-12 as amended, and Chapter 77, Public Laws of 1965), are hereby made a part of this Project. These laws include, but are not limited to:

- .1 Weekly payment of employees;
- .2 Provisions applicable to public works contracts;
- .3 Payment of prevailing wage rates;
- .4 Posting of prevailing wage rates and;
- .5 Overtime compensation.

13.10 Arbitration

13.10.1 Delete all references to arbitration in "AIA General Conditions, A201, 1987." Arbitration shall be in accordance with the provisions of the State arbitration Laws (state of Rhode Island, General Laws, Title 37, Chapter 16), which shall take precedence and shall govern.

ARTICLE 15 – SPECIAL WORK CONDITIONS

Add the following special work conditions:

The project site is of extreme historical significance. It is, therefore, required that extreme care be taken during all stages of work; PLEASE NOTE THAT DEVICES WITH OPEN FLAMES OR HEAT BUNDS WILL NOT BE ALLOWED TO REMOVE OR STRIP EXISTING PAINT LAYERS.

END OF SECTION

SECTION 00850

LIST OF DRAWINGS

General:

The drawings for this project represent an integral part of the contract documents, and should not be considered as a separate entity. These drawings, along with the technical specifications, form a complete process of disseminating information required to perform the work of this project.

The following schedule indicates the drawings of this project, which are in their respective order for convenience only, and do not obligate the Contractor to perform the work in any specific sequence. Nor is the work indicated on each drawing to be construed as specific work for a specific trade, subcontractor, or supplier.

List of Drawings:

T-1 Title Sheet

Mechanical Drawings:

M-1 HVAC Plan

M-2 HVAC Schedule

M-3 HVAC Details

Electrical Drawings:

E-1 Electrical Legend and Notes

E-2 Electrical Plan

END OF SECTION

SECTION 00900

PREVAILING WAGE RATES

The State of Rhode Island Department of Labor, Division of Professional Regulation General decision Modification document, current as the “Bid Issuance” date for this Project, is an integral part of the Bid Documents for use in fulfilling prevailing wage rate requirements. A copy is available on the website of the State of Rhode Island Department of Administration, Division of Purchases.

The Division of Purchases Website Address: <http://www.purchasing.state.ri.us>

(Click on “Information,” then click on “Prevailing Wage Table.”)

END OF SECTION

SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A Contractor's duties.
- B. Contractor use of site and premises.
- C. Work sequence.
- D. Owner occupancy.

1.02 CONTRACTOR'S DUTIES

- A. Work of the Project generally includes Air conditioning system and related electrical work
- B. Except as specifically noted, provide and pay for:
 - 1. Labor, materials, and equipment.
 - 2. Tools, construction equipment, and machinery.
 - 3. Other facilities and services necessary for proper execution and completion of Work.
- C. Pay legally required consumer and use taxes.
- D. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at time of receipt of bids.
 - 1. Permits.
 - 2. Government fees.
 - 3. Licenses.
- E. Give required notices.
- F. Comply with applicable codes, ordinances, rules, regulations, orders, and legal requirements of public authorities having jurisdiction.
- G. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.
- H. Enforce strict discipline and good order among employees. DO not employ on work:
 - 1. Unfit persons.
 - 2. Personsl not skilled in assigned task.
- I. Notify all trades, subcontractors, and suppliers of all designated alternates and be responsible for their coordination.

1.03 CONTRACTOR USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow for:
 - 1. Owner occupancy.
 - 2. Use of site and premises by public.
- B. Construction operations: Limited to areas noted on Drawings.
- C. Coordinate use of Site and Premises under direction of Owner.

1.04 WORK SEQUENCE

- A. Construction Work to accommodate Owner's occupancy requirements during the construction period, coordinate construction schedule and operations with Engineer and Owner.

1.05 OWNER OCCUPANCY

- A. The Owner will occupy the premises during the entire progress of the work.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate this requirements.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01019

CONTRACT CONSIDERATIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Schedule of Values.
- B. Application for Payment.
- C. Change procedures.
- D. Allowances.

1.02 RELATED SECTIONS

- A. Sections:
 - 1. 01300 – Submittals: Submittal procedures.
 - 2. 01400 – Quality Control: Inspection and testing.
 - 3. 01600 – Materials and Equipment: Product substitutions.

1.03 SCHEDULE OF VALUES

- A. Submit typed or printed schedule on AIA Form G703 – application and Certificate for Payment Continuation sheet.
- B. Submit Schedule of Values in duplicate as soon as practicable after notification of selection for the award of a Contract.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each item with a number and title of the major Specification Section. Identify site mobilization, bonds, and insurance.
- D. Include in each line item the amount of Allowances, if any, specified in this section. For unit cost allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- E. Include in each line item a directly proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.04 APPLICATIONS FOR PAYMENT

- A. Submit one typed original and two copies of each application on AIA Form G702 – application and Certificate for Payment, and on AIA Form G703 Continuation Sheet. Applications typed on copies of AIA Documents are not acceptable.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

- C. Include, with each monthly application, one copy of the Certified Monthly Payroll Record for the previous month's pay period.
- D. Beginning with second application for payment, Contractor's right to payment must be substantiated by documenting that payment of monies due, less maximum retainage of 10 percent, have been paid in full to subcontractors and suppliers for work, materials, or rental of equipment billed for under specific line item numbers in the immediately preceding application.
- E. Accompany applications with substantiating data on subcontractor's "Waiver of Lien" form -- AIA Document 00640. Use as many reproductions of form as needed.
- F. Accompany applications for payment for asbestos abatement work with invoices for asbestos removal and abatement, along with copies of completed shipping documents which indicate final disposal location and acknowledge receipt of material, as substantiating data to ensure payment. Payment will not be made without inclusion of this data.
- G. Accompany final application with substantiating data on the above form, and on Contractor's "Affidavit of Release of Liens" -- AIA Document 0706A.

1.05 CHANGE PROCEDURES

- A. The Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by AIA A201, 1987 Edition, Article 7.4 by issuing supplemental instructions on AIA Form G710 -- Architect's Supplemental Instructions.
- B. The Engineer may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change, with stipulation of any overtime Work required, and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate as soon as practicable, but within a period no longer than fifteen days.
- C. The Contractor may propose changes to submitting request for change to the Engineer, describing the proposed change and its full effect on the Work. Include a statement describing the reason for change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with section 01600.
- D. Stipulated sum change Order: Based on Proposal Request and Contractor's fixed price quotation, or Contractor's request for a Change Order as approved by Engineer.
- E. Construction Change Directive: Engineer may issue a directive on AIA Form G714 -- Construction Change Directive, signed by Owner and Engineer, instructing Contractor, in absence of total agreement on terms of a Change Order, to proceed with a change in the Work for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract sum and contract Time. Promptly execute the change.
- F. Time and Material Change Order: submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will

determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents. Work cannot begin until Engineer has approved a cost-not-to exceed proposal.

- G. Maintain detailed records of Work performed on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs and time extensions for changes in the Work.
- H. Change Order Form: AIA G701.
- I. Execution of Change Orders: Engineer will issue change Orders for signatures of parties as provided in the Conditions of the Contract.

1.06 ALLOWANCE(S)

- A. Contingency- Include in the contract, a stipulated sum of 5,000 for use upon Owner's instruction.
- B. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance.
- C. Funds will be drawn from Contingency Allowance only by Change order
- D. At close out of Contract, funds remaining in Contingency Allowance will be created to Owner by Change Order.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF SECTION

SECTION 01039

COORDINATION AND MEETINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Coordination.
- B. Preconstruction conference.
- C. Site mobilization conference.
- D. Progress meetings.
- E. Preinstallation conference.
- F. Equipment electrical characteristics and components.
- G. Examination.
- H. Preparation.
- I. Cutting and patching.
- j. Alteration project procedures.

1.02 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in services such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of equipment and outlets with finish elements.
- E. Coordinate completion of cleanup of work of separate sections in preparation for Substantial Completion.

- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and work not in accordance with Contract documents to minimize disruption of Owner's activities.

1.03 PRECONSTRUCTION CONFERENCE

- A. Owner will schedule a conference after Notice of Award.
- B. Attendance Required: Owner representative, Engineer, and Contractor.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, list of projects, Schedule of Values, and Progress Schedule.
 - 5. Designation and confirmation of the roles, or personnel representing the parties in the Contract, and the Engineer.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract Close-out Procedures.
 - 7. Scheduling.

1.04 SITE MOBILIZATION CONFERENCE

- A. Engineer will schedule a conference at the Project site prior to Contractor occupancy.
- B. Attendance Required: Owner representative, Engineer, special Consultants, Contractor's superintendent, and major subcontractors.
- C. Agenda:
 - 1. Use of premises by Owner and Contractor.
 - 2. Owner's requirements.
 - 3. Construction facilities and controls provided by Contractor.
 - 4. Temporary utilities provided by Owner.
 - 5. Building layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.
 - 8. Procedures for testing.
 - 9. Procedures for maintaining record documents.
 - 10. Requirements for start-up of equipment.
 - 11. Inspection and acceptance of equipment put into service during construction period.

1.05 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work as may be required.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies within one week to Engineer, Owner, participants, and those affected by decisions.

- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Engineer, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems which impede planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.\
 - 13. Other business relating to Work.

1.06 PREINSTALLATION CONFERENCES

- A. When required in individual Specification Section, convene a preinstallation conference at work site prior to commencing Work of the Section.
- B. Require attendance of parties directly affecting, or affected by, Work of the specific Section.
- C. Notify Engineer four days in advance of meeting.
- D. Prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to participants with two copies to Engineer.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural attachment of new work being applied or attached.
- C. Verify that utility services are available, of the correct characteristics, and in the correct location.

- D. Examine and verify specific conditions described in individual Specification Sections.

3.02 CUTTING AND PATCHING

- A. Employ original or skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements which affect:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
 - 4. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work, and to:
 - 1. Fit the several parts together to integrate with other work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed work for testing.
 - 5. Provide openings in elements of work for penetrations of mechanical and electrical work.
- D. Execute Work by methods which will avoid damage to other work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore work with new projects in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during the Work to the Engineer for decision or remedy.

3.03 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in project sections; match existing products and Work for patching and extending Work.
- B. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.
- C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring products and finishes to original or specified condition.

END OF SECTION
Section 01039 - 4

COORDINATION AND MEETINGS
FMS 3 Warwick Armory- HVAC Upgrade

SECTION 01300

SUBMITTALS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures.
- B. Construction Progress Schedules.
- C. Proposed Products List.
- D. Shop Drawings.
- E. Product Data.
- F. Samples.
- G. Manufacturers' Instructions.
- H. Manufacturers' Certificates.

1.02 RELATED SECTIONS

- A. Section 01400 – Quality Control: Manufacturers' field services and reports.
- B. Section 01700 – Contract Closeout: Contract closeout submittals.

1.03 SUBMITTAL PROCEDURES

- A. Submittals Prepared Using Copyrighted AIA Forms:
 - 1. Use only original copyrighted forms for the first typed copy of each submission. Do not use unauthorized duplications of copyrighted forms for the first typed copy.
 - 2. Proceed to reproduce one or more copies of the first typed copy as may be required.
 - 3. Copyrighted forms are those printed forms purchased through an authorized outlet, or reproduced under license from the AIA Electronic Document Service.
- B. Transmit each submittal with a dated transmittal form.
- C. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- D. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and Specification Section number, as appropriate.
- E. Apply contractor's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

- F. Schedule submittals to expedite the Project, and deliver to Engineer at business address. Coordinate submission of related items.
- G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed work.
- H. Provide space for Contractor and Engineer review stamps.
- I. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- J. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- K. Allow 14 days, excluding delivery time to and from the Contractor, for each submittal for review.
- L. Submittals not requested will not be recognized or processed.

1.04 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit initial progress schedule in duplicate within 15 days after date of Owner-Contractor Agreement for Engineer and Owner review.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each application for Payment identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates including those furnished by Owner and under allowances.

1.05 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalogue designation, and reference standards.

1.06 SHOP DRAWINGS

- A. Submit in the form of one reproducible transparency and one opaque reproduction.
- B. Submit for review. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01700 – Contract Closeout.
- C. Indicate special characteristics or requirements.

1.07 PRODUCT DATA

- A. Submit the number of copies which the Contractor requires, plus one copy which will be retained by the Engineer. Submit minimum of six (6) copies.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. Indicate special characteristics and utility connection requirements.
- D. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01700 – Contract Closeout.

1.08 MANUFACTURERS' INSTRUCTIONS

- A. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.09 MANUFACTURERS' CERTIFICATES

- A. When specified in individual Specification Sections, submit manufacturers' certificate to Engineer for review in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Quality Assurance – Control on Installation.
- B. References.
- C. Field samples.
- D. Verifications of Licenses and Credentials.
- E. Manufacturers' Field Services and Reports.
- F. Tolerances.

1.02 RELATED SECTIONS

- A. Section 01019 – Contract Considerations.
- B. Section 01600 – Material and Equipment: Requirements for material and product quality.
- C. Individual Specifications Sections: Required tests.
- D. Section 01650 – Starting of systems: Testing, adjusting, and balancing of systems.
- E. Section 01700 – Contract Close-out: Project Record Documents.

1.03 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce Work of specified quality.
- B. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate more rigid standards or more precise workmanship.
- C. Perform work by persons qualified to produce workmanship of specified quality.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, racking, and physical distortion or disfigurement.
- E. Comply with manufacturers' instruction in full detail including each step in sequence. Should instructions conflict with Contract documents, request clarification from Engineer before proceeding.

1.04 VERIFICATION OF CREDENTIALS AND LICENSES

Section 01500 - 1

- A. Persons employed on the project site shall have appropriate and current credentials and licenses in their possession at the project site for the work they are performing.
- B. State residence inspectors will be reviewing Contractor's Certified Monthly Payroll Records for conformance with Rhode Island state Prevailing Wage Requirements.
- C. Those persons without the appropriate credentials and licenses will be subject to dismissal from the project site.

1.05 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standard, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date of Contract documents, except where a specific date is established by code.
- C. Obtain copies of standards when required by Contract Documents.
- D. Should specified reference standards conflict with Contract Documents, request clarification from Engineer before proceeding.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.06 FIELD SAMPLES

- A. Install field samples at the site as required by individual Specification Sections for review.
- B. Acceptable samples represent a quality level for the Work.
- C. Where field sample is specified in individual Sections to be removed, clear area after field sample has been accepted by Engineer.

1.07 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in respective Specification Sections, require supplier or manufacturer to provide qualified staff personnel to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to make appropriate recommendations and initiate instructions when necessary.
- B. Submit qualifications of observer to Engineer 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Submit written report within 30 days to Engineer listing observations and recommendations.

1.08 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract documents, request clarification from Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities: Electricity, lighting, and sanitary facilities.
- B. Temporary Controls: Barriers, enclosures, and protection of the Work.
- C. Construction Facilities: Parking and progress cleaning.

1.02 RELATED SECTIONS

- A. Section 01700 – Contract Closeout: Final cleaning.

1.03 TEMPORARY ELECTRICITY

- A. Connect to existing power service. Power consumption shall not disrupt Owner's need for continuous services.
- B. Owner will pay cost of energy used. Exercise measures to conserve energy.
- C. Permanent convenience receptacles may be utilized during construction.

1.04 TEMPORARY LIGHTING

- A. Permanent building lighting may be utilized during construction.

1.05 TEMPORARY SANITARY FACILITIES

- A. Designated existing facilities may be used during construction operations.

1.06 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

1.07 PROTECTION OF INSTALLED WORK

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.

1.08 SECURITY

- A. Coordinate with Owner's security program.

1.09 PARKING

- A. Designated existing on-site areas may be used for parking areas to accommodate construction personnel.

1.10 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

1.11 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Clean and repair damage caused by installation or use of temporary work.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Transportation and handling.
- C. Storage and protection.
- D. Product options.
- E. Substitutions.

1.02 RELATED SECTIONS

- A. Section 00100 – Instructions to Bidders: Product options and substitution procedures.
- B. Section 01400 – Quality Control: Product quality monitoring.

1.03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract documents.
- C. Provide interchangeable components of the same manufacturer for similar components.

1.04 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturers' instructions.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturers' instructions with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

- B. Provide off-site storage and protection when site does not permit on-site storage or protection.
- C. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- D. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

1.06 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, not options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.07 SUBSTITUTIONS

- A. Instructions to bidders specify time restrictions for submitting requests for substitutions during the bidding period to requirements specified in this Section.
- B. Substitutions may be considered when a product become unavailable through no fault of the Contractor.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. A request constitutes a representation that the bidder:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
 - 2. Will provide the same warranty for the substitution as for the specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extensions which may subsequently become apparent.
 - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities.
- E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit three (3) copies of request for substitution for consideration. Limit each request to one proposed substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence.
3. The Engineer will notify Contractor, in writing, of decision to accept or reject request.

END OF SECTION

SECTION 01650

STARTING OF SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Starting Systems.
- B. Demonstration and Instructions.

1.02 RELATED SECTIONS

- A. Section 01400 – Quality Control: Manufacturers' field reports.
- B. Section 01700 – Contract Closeout: system operation and maintenance data and extra materials.

1.03 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Engineer and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Execute start-up under supervision of responsible manufacturer's representative or Contractor's personnel in accordance with manufacturer's instructions.
- F. When specified in individual Specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment of system in operation.
- G. Submit a written report in accordance with Section 01400 that equipment of system has been properly installed and is functioning correctly.

1.04 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion final inspection.
- B. Demonstrate Project equipment and instruct Owner's personnel by a qualified manufacturer's representative who is knowledgeable about the Project.

- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled or agreed-upon times at equipment or designated locations.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Closeout Procedures.
- B. Final Cleaning.
- C. Adjusting.
- D. Project Record Documents.
- E. Operation and Maintenance Date.
- F. Warranties.
- G. Spare Parts and Maintenance Materials.

1.02 RELATED SECTIONS

- A. Section 01500 – Construction Facilities and Temporary Controls: Progress cleaning.
- B. Section 01650 – Starting of Systems: System start-up, testing, adjusting, and balancing.

1.03 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final application for Payment identifying total adjusted Contract sum, previous payments, and sum remaining due.
- D. Owner will occupy portions of the building as specified in Section 01010.
- E. Convey fully corrected and updated set of Project Record Documents to Engineer with Final Application for Payment.

1.04 PROJECT RECORD DOCUMENTS

- A. Maintain on-site one set of the following Record Documents; record actual revisions to the Work:
 - 1. Contract Drawings
 - 2. Specifications.

3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
- B. Ensure entries are complete and accurate, enabling reliable future reference by Owner.
 - C. Store Record Documents separate from documents used for construction.
 - D. Record information concurrent with construction progress.
 - E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by addenda and modifications.
 - F. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 2. Field changes of dimension and detail.
 3. Details not on original Contract Drawings.
 - G. Remove Engineer title block and seal from all documents.
 - H. Submit documents to Engineer with claim for final Application for Payment.
- 1.05 OPERATION AND MAINTENANCE MANUAL\
- A. Submit two sets prior to final inspection, bound in 8 ½" x 11" text pages, three D side ring binders with durable plastic covers.
 - B. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of project, and subject matter of binder when multiple binders are required.
 - C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
 - D. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, type on 24-pound white paper, in three parts as follows:
 - Part 1: Directory listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 1. Significant design criteria.
 2. List of equipment.
 3. Parts list for each component.

4. Operating instructions.
5. Maintenance instructions for equipment and systems.
6. Maintenance instructions for finishes, including recommended cleaning methods and materials and special precaution identifying detrimental agents.

Part 3: Project documents and certificates including the following:

1. Shop Drawings and product data.
 2. Certificates.
 3. Photocopies or warranties and bonds.
- E. Submit one copy of completed volumes in final form 15 days prior to final inspection. This copy will be returned after final inspection with Engineer comments. Revise content of documents as required prior to final submittal.
- F. Submit two sets of final volumes revised within ten days after final inspection.

1.06 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subconsultants, suppliers, and manufacturers.
- C. Provide Table of Contents and assembly in three D-side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.
- E. For items or Work delayed beyond date of substantial Completion, provide updated submittal within ten days after acceptance listing date of acceptance as start of warranty period.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual Specification Sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

1.08 DEMONSTRATION AND TRAINING

Provide administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment through factory Authorized service representative. Training in operation and maintenance of systems and equipment.

END OF SECTION

SECTION 15010

BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates, Addenda, Division 1 and 16 are a part of this Specification. Contractors and Subcontractors shall examine same as well as other Divisions of the Specifications which affect work under this Division.

1.2 DESCRIPTION OF WORK

- A. Mechanical Electrical and all other Drawings as well as the Specifications for all the Divisions are a part of the Contract Documents.
- B. Drawings and Specifications are to be considered as supplementing each other. Work specified but not shown, or shown but not specified, shall be performed or provided as though mentioned in both Specifications and Drawings.

1.3 WORK INCLUDES

- A. Mechanical Contractor shall include in his bid proposal the cost of all labor, material and equipment for HVAC, Temperature controls, Electrical as specified, identified or located on the drawings and specifications.

- C. All prime contractors shall include the cost to coordinate their work with their subcontractors.

D ALLOWANCES

- 1. Cash Allowance: Refer to Division 1 for allowance sum applicable to Work.

1.4 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 1.
- B. Division 16 - Electrical.

1.5 QUALITY ASSURANCE

A. Codes and Permits:

- 1. Comply with rules, regulations of State, County, and City authorities having jurisdiction

over the premises, including safety requirements of OSHA. Do not construe this as relieving Contractor from complying with Specifications which exceed Code requirements and not in conflict therewith.

2. Secure and pay for all permits and certificates of inspection required. Make payments to all Public Utilities for work performed by them in providing service connections.
3. Deliver official record of approval, by governing agencies, to Architect.

1.6 REFERENCES

- A. Comply with applicable provisions of latest editions of following National Standards:

National Plumbing and Sanitary Code
NFPA
Pressure Piping and Mechanical Refrigeration Systems
and Equipment
ASHRAE Recommended Construction for Ductwork
SMACNA Duct Construction Standards
ASTM
American Welding Society Code
National Pressure Vessel Code
National Electric Code
NFPA Life Safety Code and Standards

1.7 SUBMITTALS

- A. Shop Drawings and Product Data:

1. Prepare shop drawings and product data for mechanical equipment with adequate details and scales as necessary to clearly show construction. Indicate the operating characteristics for each required item and the design conditions for each. Clearly identify each item on the Drawings as to mark, location, and use.
2. Prior to submitting each shop drawing, the Contractor shall review said shop drawings for compliance with the contract documents. The Contractor's stamp and signature shall indicate his approval.
3. Shop drawings and product data includes:
 - a. Thermometers, gauges, hangers, supports and access doors.
 - b. Insulation.
 - c. Pipe, fittings and valves.
 - d. Expansion compensators and guides.
 - e. Insulation.
 - f. Domestic water heaters.
 - g. Pumps, including characteristic curves.

- h. Backflow preventers.
 - i. Heat transfer equipment.
 - j. Ductwork, flues, dampers, louvers, grilles, registers and diffusers.
 - k. Air distribution equipment.
 - l. Temperature control components and system drawings.
 - v. Wiring diagrams, starters and controls for electrically operated equipment furnished by the mechanical trades.
4. The submittals will be reviewed only for general compliance and not for dimensions, quantities, etc. The submittals that are returned shall be used for procurement. The responsibility of correct procurement remains solely with the Contractor. The submittals review shall not relieve the Contractor of responsibility for errors or omissions and deviations from the Contract requirements.
5. If the submittal shows variations from the requirements of the Contract Documents, for any reason, the Contractor shall make mention of such variation in his letter of transmittal. The Contractor shall note in red on the submittal any change in design or dimension on these items submitted including changes made by the manufacturer which may differ from catalog information.
6. Contractor agrees that shop drawing submittals processed by the Engineer are not change orders. The purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design. The Contractor demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.
7. Contractor further agrees that if deviations, discrepancies or conflicts between shop drawing submittals and the Contract Documents are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed.
8. Where listed alternatives alter the design or space requirements indicated on the drawings, include all items of cost for the revised design and construction including cost of all allied trades involved.
9. Shop drawings and product data shall be submitted as follows:
- a. Conform to submittal requirements outlined in Division 1.
 - b. Where contents of submittal literature includes data not pertinent to the submittal, clearly indicate which portion of content is being submitted for review.
 - c. Submit shop drawings and product data so that related systems, products, and accessories are grouped in a single submittal.
 - d. Mark dimensions and values in units to match those specified.

B. COORDINATION DRAWINGS

1. Prior to the start of construction, this Contractor shall prepare and submit to the Engineer a

complete set of reproducible coordination drawings indicating the routings sizes and invert elevations of all underground plumbing crossing through, under, above, and/or otherwise affecting subsurface footings and grade beams.

2. Drawings shall be prepared in the same scale as the Architectural structural plans and shall illustrate all relevant foundation and underground plumbing.

C. RECORD DRAWINGS

1. Each Contractor or Subcontractor for Mechanical work shall keep one complete set of the contract working drawings on the job site on which he shall record any deviations or changes from such Contract Drawings made during construction. Record drawings shall show changes in:
 - a. Size, type, capacity, etc. of any material, device or piece of equipment.
 - b. Location of any device or piece of equipment.
 - c. Location of any outlet or source in building service system.
 - d. Routing of any piping, conduit, ducts, sewers or other building services.
2. Record drawings shall also indicate the location of all concealed water, natural gas, main storm and sanitary drain piping. Plans also shall show invert elevation of sewers and top of water service lines.
3. Record drawings shall be kept clean and undamaged, and shall not be used for any purpose other than recording deviations from working drawings.
4. After the project is complete these sets of drawings shall be delivered to the Architect in good condition, as a permanent record of the installation as constructed.
5. Refer to Division 1 Specifications for additional requirements related to Record Drawings.

D. GUARANTEE AND WARRANTIES

1. Refer to Products Section for requirements, furnish two (2) executed copies.

E. OPERATING/MAINTENANCE MANUAL

1. Refer to Execution Section for submittal requirements.

1.8 COORDINATION AND SUPERVISION

- A. Examine work of other trades which comes in contact with or is covered by this work. Do not attach to, cover, or finish against any defective work, or install work of this Division in a manner which will prevent other trades from properly installing their work. Consult all drawings, specifications and details of other Divisions included as part of the Contract Documents.
- B. If any work is installed so that the architectural design cannot be adhered to, Contractor is liable

for cost of making such changes as Architect may require. Before installing work, report any interference's between work of this Division and work of other Divisions to Architect as soon as discovered. Architect will determine which work must be relocated, or make adjustments to maintain clearances, maximum headroom and to avoid conflict with other work.

- C. Provide adequate competent supervision at all times when work is being performed. Cooperate with all other trades to avoid interference's and delays.
- D. The General Contractor will provide chases and openings in walls, floors, ceilings and partitions of construction to receive pipe lines, risers, ducts and other equipment insofar as it is possible to predetermine the exact location, but the Contractor shall install his work sufficiently in advance of the building construction to permit his work to be built into place. The Contractor shall advise the General Contractor of the exact size and location of all chases and openings required for the installation of his work and shall check size and location of all such chases and openings provided by the General Contractor.

1.9 PROVISIONS FOR LATER INSTALLATION

- A. When mechanical work cannot be installed concurrent with building construction, arrange for building-in boxes, sleeves, inserts, etc., as necessary for installation thereof at a later date. Assume responsibility for location of chases and other openings through masonry and concrete construction.
- B. Become acquainted with nature of construction against which this work attaches. Review structural drawings for coordination of openings. Cut no structural members or slabs without Architect's written instructions.

1.10 LOCAL CONDITIONS

- A. Visit site, become familiar with conditions affecting this work. No additional payment will be made on claims that arise from lack of knowledge of existing conditions.
- B. Exercise extra care when working in areas where underground services may exist. Any costs for repair of damage to such services become the responsibility of Contractor causing damage.
- C. This project involves remodeling of existing areas in an operating facility. Plan work including alterations and connections to existing facility to permit carrying on of normal building functions. When necessary to temporarily interrupt a service, arrange with Owner in advance as to time which will be least disruptive. Consider all work as being performed during normal working hours and in conformity with approved work progress schedule.
- D. Insulation or materials shall be identified before attempting any demolition. Contractor shall comply with the requirements of EPA regulations, National Emissions Standards and the OSHA regulations, Section 1910.1001 as well as applicable Rhode Island State laws and City Codes and Ordinances. Asbestos insulation if found shall be removed under another contract.
- E. All materials used for patching shall be in conformance with the applicable sections of the

specifications. Where materials are not specifically described but require for proper completion of the work, they shall be as selected by the Contractor subject to approval of the Architect/Engineer.

- F. Provide temporary services of any nature required to keep building functioning. Remove temporary services when permanent facilities are completed.

1.11 PROTECTION

- A. At all times keep premises and building in neat and orderly condition, follow explicitly any instructions of Architect in regard to storing of materials, protective measures and disposing of debris.
- B. When setting up pipe shop with cutting and threading machines, protect area against staining and abrasion. Cost of correcting any such condition will be charged against the respective Contractor.
- C. Protect finished floors from chips and cutting oil by use of a chip receiving pan and oil proof cover.
- D. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
- E. Protect floors from paint droppings, insulation adhesive, etc. by use of drop cloths.

1.12 PRODUCT HANDLING

- A. Pay all costs for transportation of materials and equipment to job site.
- B. Provide all scaffolding, tackle, hoists and rigging necessary for placing mechanical materials and equipment in their proper place. Comply with applicable Federal, State, and Local regulations for all scaffolding and hoisting equipment. Remove temporary work when no longer required.
- C. Arrange for packaging of equipment, which must be hoisted, so that there will be no damage or distortion caused by hoisting operation. Protect all coils, bearings, fan shafts and housings from any damage during hoisting operation.
- D. Store fans, pumps, control assemblies, motors, starters, controls, air handling and conditioning equipment, plumbing fixtures, etc., in dry location until building is ready to receive them. Protect all openings, bearings, motor controls, etc., from dirt and moisture.

1.13 OPERATING INSTRUCTIONS

- A. This Contractor must schedule all equipment and system demonstrations, including personnel, at an agreeable time with the Owner.
- B. The Contractor shall furnish the services of qualified personnel, approved by the Architect and Engineer and thoroughly familiar with the completed installation to instruct the permanent

operating personnel in the proper operation of all systems included under this Contract and the proper care of all equipment and apparatus.

- C. When instructions are provided, the Contractor shall have in his possession three copies of an identifying letter which shall list the names of the Contractor's qualified instruction personnel including manufacturers' representatives and subcontractors that will be giving instructions. Likewise on the same letter, spaces shall be provided for the Owner's personnel who will receive the instructions. After instructions have been given and received for each piece of equipment and system, the Contractor's representative and subcontractors shall sign and date the letter and the Owner's personnel shall sign and date the letter acknowledging that they have received adequate instructions for operating and maintaining the systems and equipment. One signed copy shall be delivered to the Owner, one copy to the Architect/Engineer and one copy shall be retained by the Contractor.
- D. It is the intent that all systems with their complement of equipment and auxiliary equipment operate properly in accordance with the design concept and functional intent. It is also the intent that the Owner be given complete instructions for the proper operation and maintenance of all systems.

1.14 DAMAGE AND EMERGENCY REPAIRS

- A. Assume responsibility for any damage caused by leaks in the piping system being installed or reworked under this Contract. Repair all damage without extra cost to Owner.
- B. Owner reserves the right to make emergency repairs as required to keep equipment in operation, without voiding Contractor's guarantee or relieving him of responsibility during warranty period.
- C. Restore roads, grounds, tunnels, insulation, piping, building, etc., to their original condition whenever this work causes damage.

1.15 GUARANTEE AND WARRANTIES

- A. Warrant that equipment and all work is installed in accordance with good engineering practice and that all equipment will meet requirements specified. Any equipment failing to perform or function as specified shall be replaced with complying equipment, without cost to the Owner.
- B. Guarantee against defects in workmanship and materials; make good, repair or replace any defective work, material or equipment within one year from date of acceptance.
- C. Manufacturer shall guarantee air conditioning equipment refrigeration compressors for a minimum of five years.

PART 2 PRODUCTS

2.1 MATERIAL SUBSTITUTIONS

- A. Bids shall be based upon the specified product or listed alternative. Drawings and Specifications

are based on the products specified by type, model, and size and thus establish minimum qualities and capacities which substitutes must meet to qualify as acceptable.

- B. Should the Contractor propose to furnish materials and equipment other than those specified, Contractor shall submit a written request for substitutions to the Architect 10 days prior to bid opening. The request shall be an alternate to the original bid; be accompanied with complete descriptive (manufacturer, brand name, model number, etc.) and technical data for all items. Indicate any additions or deductions to contract price.
- C. Where the Contractor elects to substitute materials or equipment approved by the Architect/Engineer, the Contractor will be held responsible for all structural, mechanical and electrical changes required for the installation of the substituted materials at no additional cost to the Owner.
- D. Should the Contractor elect to propose a substitution after the project has been awarded, the Contractor will be billed for the time spent by the Architect and Engineer in evaluating the proposed substitution. This billing shall occur whether the proposed substitution is accepted or rejected and shall be at the rate of the direct cost to the Architect and Engineer times a 2.5 multiplier.
- E. Acceptance or rejection of the proposed substitutions shall be subject to approval of the Architect and Engineer. If requested, the Contractor shall submit inspection samples of both the specified and proposed items.
- F. Where only one make is named in the Specifications or on the Drawings, it shall be provided.
- G. Verbal requests or approvals shall not be binding on the Architect, Engineer or Owner.

2.2 EQUIPMENT AND MATERIALS

- A. All equipment and materials shall be new, full weight and of the best quality with the same brand or manufacture used for each class of material or equipment.
- B. Provide material and labor which is neither drawn nor specified but which is obviously a component part of and necessary to complete work and which is customarily a part of work of similar character.
- C. Provide incidental concrete, reinforcing steel, masonry, mortar, miscellaneous steel, painting and the like required to complete installations; perform in manner specified in applicable Division of the Specification.

PART 3 EXECUTION

3.1 INSTALLATION REQUIREMENTS

- A. Location of piping, equipment, ducts, etc., on the drawings are diagrammatic; indicated positions shall be followed as closely as possible, exact locations shall be subject to building construction

and interference's with other work. In general, conceal piping and ductwork located outside of equipment rooms. Difficulties preventing the installation of any part of work as indicated, shall be called to the attention of the Architect. Architect will determine locations and changes. Contractor shall install the work accordingly. Architect reserves right to make minor changes in location of any part of the work up to the time of roughing-in without additional cost.

- B. All materials and equipment shall be installed in a neat and workmanlike manner by a competent specialist for each subtrade. The installation of any material and equipment not meeting these standards may require removal and reinstallation at no additional cost to the Owner.
- C. Piping, ducts, etc., located in pipe spaces must be located to ensure maximum accessibility. Where necessary to cross pipe spaces, crossing must be made near the floor or 6 feet or more above the floor.
- D. Install, connect equipment, services, materials in accordance with best engineering practice and in conformity with manufacturer's printed instructions. Provide complete auxiliary piping, water seals, valves, electric connections, controls, etc. as recommended by manufacturer or required for proper operation.
- E. Take all measurements and determine all elevations at the building.
- F. Do all cutting and patching in existing construction as necessary for installation of this work. Do not cut any structural member without specific permission from the Architect. Have cutting done by skilled mechanics as carefully as possible, and with as little damage as possible. Have patching done by first-class mechanics as skilled in the several trades.
- G. At locations in project involving alterations or additions, assume responsibility for removal, rerouting, protection and replacement of existing facilities as necessary to install new work. Work to be executed by craft which customarily or by jurisdictional award performs such service.
 - 1. Remove, relocate or disconnect existing equipment and fixtures indicated including mechanical connections such as heating/chilled water supply and return, steam, water, waste, gas, ductwork, etc. Where existing equipment or fixtures are to be relocated, thoroughly clean and refurbish before reinstalling in the new location. Provide all pipe, fittings, valves, etc. necessary for complete installation.
 - 2. Where existing fixtures or equipment are to be removed or abandoned, cap/plug all sewers, vents, drains, water lines, gas piping, heating/chilled water supply and return, steam and condensate piping and ductwork no longer needed, behind finished floors, walls, or ceilings as directed and as required by Code.
 - 3. Unless fixtures and equipment are designated to be transferred to Owner's storage, removed items are surplus and become property of Contractor to be removed from site.
- H. The Contractor shall furnish the services of manufacturers' representatives for all equipment furnished under these Contract Documents. The amount of factory service provided by the Contractor shall be as normally recommended and furnished by the various equipment

manufacturers unless specified otherwise. Testing of such systems and equipment shall be made under the direct supervision of competent authorized service representatives. Any and all expenses incurred by the equipment manufacturers' representatives shall be borne by the Contractor.

3.2 PAINTING

- A. Finish painting is included under Division 9 - Finishes, except where specifically called for under this Division.
- B. Certain painting specified as part of the Mechanical Trades work is included herein.
- C. Materials and equipment installed under this Division shall be left free from dirt, grease and foreign matter, ready for painting.
- D. No equipment or piping shall be painted before being tested.
- E. Damaged surfaces of prefinished materials and equipment shall be refinished painted to match existing finish.
- F. All exterior exposed piping, supports and related structural steel shall be painted with three coats of an appropriate rust prohibitive material suitable for exposed conditions. Architect shall select finish coat color.

3.3 PIPE IDENTIFICATION

- A. Identify all pipe in Equipment Rooms, pipe tunnels, above accessible ceilings and in accessible shafts as follows:
 - 1. Color code ID bands or marker backgrounds to identify contents of pipe in conformance with color Scheme for Identification of Piping Systems, ANSI A13.1-1981.
 - 2. Provide identifying band of color at least 6" wider near each valve and fitting, on both sides of pipes passing through walls, on long runs at not over 20 foot intervals, and at access door locations.
 - 3. Indicate on pipe, by stenciling with 1" high letters, direction of flow and contents. Place in location so as to be easily read from the floor. Lacquer or varnish over stencils.
 - 4. Manufactured labels and color bands are acceptable, provided they are applied to clean, dust free surfaces so as not to loosen and per manufacturers written instructions.

3.4 EQUIPMENT IDENTIFICATION

- A. Identify each piece of equipment and ductwork as to nature of service and system number corresponding to designation on design drawings by stenciling with 1" high letters or attaching two color engraved plastic nameplates. Apply one coat of lacquer or varnish over the stencils.

<u>Item</u>	<u>Type Identification</u>
Pumps	Stencil
Motor Starters	Nameplate
Air Handling Units	Stencil
Switches, Pilot Lights (Remote)	Nameplate
Condensing Units, Condensers	Stencil
Boilers	Stencil

- B. Lettering shall include horsepower, voltage rating and service designation.
- C. Nameplates shall be laminated phenolic with a black surface and white core. Use 1/16" thick material for plates up to 2" x 4". For larger sizes use 1/8" thick material.
- D. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use 1/4" minimum height letters which occupy four letters per inch.

3.5 VALVE TAGS

- A. Provide a numbered two color engraved plastic tag approximately one (1) inch in diameter, attached to hand wheel of each valve with non-rusting "S" hook or nylon strap of adequate size. Local stop and shutoff valves to an equipment item need not be tagged.
 - 1. Engrave each tag with number and service designation of valve. Prefix numbers with "P" for Plumbing and "H" for Heating. In color lines, background plastic color shall correspond to service identification color.
 - 2. Accurately record numbers and locations on the "Record Drawings".
 - 3. Provide typed valve directories in framed, plexiglass covered enclosure, identifying each valve as to size, type, service and location. Mount where directed by Owner.
 - 4. Where valves occur above lay-in ceilings fasten 3/4" square plastic marker to panel below valve. Marker shall have white background with black engraved letters and numbers identifying valve concealed above.

3.6 OPERATING/MAINTENANCE MANUAL

- A. Furnish three complete bound sets of service manuals containing operating and maintenance instructions for all mechanical equipment and controls.
- B. Service manuals shall be assembled into one book with written instructions for each system listed in the Specifications.
- C. Bind the written operating instructions, approved shop drawings, equipment catalog cuts and manufacturer's instructions into a hard-backed binder where they can be accommodated into 8½"

x 11" size.

- D. Submit one copy to the Architect for approval. After approval, submit three (3) copies to the Architect for delivery to the Owner.
- E. Manuals shall include:
 - 1. Title of job, Owner, address, date of submittal, name of Contractor and name of Engineer.
 - 2. Index.
 - 3. Identification, name, mark, number as indicated on Drawings.
 - 4. Step by step procedures for startup and shut down on each system and piece of equipment.
 - 5. Normal equipment operating characteristics.
 - 6. Performance data, curves, ratings.
 - 7. Wiring diagrams.
 - 8. Manufacturer's descriptive literature.
 - 9. Automatic controls with diagrams and written description of operation.
 - 10. Manufacturer's maintenance and service manuals.
 - 11. Plumbing fixtures.
 - 12. Spare parts and replacement parts list for each piece of equipment.
 - 13. Name of service agency and installer.
 - 14. Final accepted shop drawings.
 - 15. Maintenance and lubrication instructions.
 - 16. Belt sizes, type and lengths.
 - 17. Copy of test and balance report.

3.7 CLEANING UP

- A. Upon completion of work, remove all tools, equipment, surplus materials and thoroughly clean all piping, fixtures and equipment removing all dirt, grease and oil.
- B. Replace all filters used during construction with proper system filters at completion of work.
- C. Provide chemical cleaning for piping systems with an approved detergent to remove pipe dope, slushing compounds, oils, welding slag, loose mill scale and other extraneous materials.
 - 1. Fill heating water, chilled water and condenser water systems with clean water and flush; refill with clean water to which proper amount of detergent has been added, circulate for at least 8 hours. Drain system and flush with clean cold water. Add water treatment at this time.
- D. After initial period of operation clean all strainers, traps and dirt legs.

3.8 LUBRICATION, PACKING AND SUPPLIES

- A. Properly lubricate all rotating, reciprocating equipment before it is started with correct grade, type

and quantity of lubricant.

- B. Check each shaft containing a packing gland for condition by backing packing gland off and examining for proper grade, amount and type of packing as recommended by the manufacturer.
- C. Maintain all lubrication, gaskets and packing during construction; assure that at the time of acceptance all are in first class condition.
- D. Provide initial charge of refrigerant and any other supplies required to place equipment in operation.

3.9 TESTS AND ADJUSTMENTS

- A. Obtain all inspections required by law, ordinances, rules, regulations of authorities having jurisdiction and furnish certificates of such inspections. Pay all fees and provide all equipment, power and labor necessary for inspections and tests.
- B. During testing period maintain on job a competent engineer thoroughly familiar with all phases for as long a period as required to thoroughly adjust all systems and demonstrate that they are functioning properly.
- C. Perform all tests, including but not limited to those hereinafter specified make necessary adjustments to obtain specified equipment and system characteristics.
- D. Do not consider work under this Specification complete until Contractor has obtained required inspections, performed tests, made necessary adjustments and has submitted satisfactory evidence of compliance. Architect reserves the right to make spot checks to determine accuracy and completeness of final adjustments.
- E. Pressure Tests:
 - 1. All piping systems shall be given the following pressure test without appreciable pressure drop. Equipment which would be damaged by the required test pressure shall be isolated from the system during test.

<u>SERVICE</u>	<u>MEDIUM</u>	<u>(PSI)</u>	<u>HRS.</u>
Heating hot water	Water	125	6
Gas	Air	50	6

- 2. Test medium for refrigerant piping shall be oil-free pumped dry nitrogen. Twenty-four hour standing time minimum. Test the low side of the system to 150 psi and the high side to 300 psi. Tests shall conform to "Pressure Piping Code" 4101:8-3 and ANSI Standard B31.5 "Refrigerant Piping".
- 3. Correct minor leaks in welded joints by chipping out weld and rewelding. Correct leaks in screwed joints by replacing thread or fitting or both. Caulking of threaded joints is not

permitted. Repair leaks in copper tubing by sweating out joints, thoroughly cleaning both tube and fitting, and resoldering.

4. Hydrostatic and/or air tests shall be made before piping is concealed or covered. Contractor shall be responsible for completely draining the systems after hydrostatic tests are performed. Any damage from freezing prior to acceptance of the completed installation shall be repaired at the sole expense of this Contractor.

F. HVAC Systems Adjustments & Balance:

1. Provide services of a certified Associated Air Balance Council (AABC) or National Environmental Balancing Bureau (NEBB) test agency to test and balance HVAC systems. Conduct all test in accordance with AABC OR NEBB, National Standards for Field Measurements and Instrumentation.
2. The testing and balancing agency and the temperature control contractor shall cooperate in a joint effort as necessary to achieve properly tested and balanced systems.
 - a. The responsibility of the temperature control contractor will be to establish the mode of operation required by the testing and balancing agency for proper testing and to perform programming and/or setpoint changes as required by the testing and balancing agency.
 - b. The responsibility of the testing and balancing agency is to perform all the actual testing and balancing of all HVAC equipment and to verify the operation of the HVAC temperature control system.
3. The HVAC Contractor shall make all changes in sheaves, belts, and dampers as required. Add dampers as requested by the Air Balance Agency for correct balance at no additional cost to the Owner.
4. Do not begin adjustments until systems have been completed and are in full working order. Put all heating, ventilating, air conditioning, exhaust systems and equipment into full operation and continue operation of same during each working day of testing and balancing. All testing and balancing shall be done under both summer and winter design conditions.
5. Perform tests and balance systems in accordance with following requirements:
 - a. Test and adjust all air handling systems for design flow of supply, return, relief, exhaust and outside air to within 10% of design requirements.
 - b. Identify each diffuser, grille and register as to location and area. In readings and tests of diffusers, grilles and registers, tabulate required velocity and CFM, test velocity and CFM after adjustment and list size, type and manufacturer of diffusers, grilles and registers. Adjust supply diffusers, grilles and registers for proper air distribution pattern to eliminate drafts.

- c. For each piece of air handling equipment, list fan data, motor and drive. Test and record fan motor horsepower, full load amperes, fan speed, system suction and discharge static pressure. Determine CFM by means of velocity traverse at a minimum of three fan diameters from fan outlet.
- d. Balance hot water heating radiation, coils and unit heaters to obtain required water temperature drop corrected for entering water conditions.
- e. Balance all water using equipment, such as heat exchangers, coils, condensers, chillers, reheat coils, etc., to obtain required water pressure drop and flow rate. List specified flow rate and water pressure drop for each piece of equipment. Tabulate an air/water balance showing entering and leaving water temperatures and entering and leaving air dry and wet bulb temperatures.
- f. List design data for each pump. Obtain by measurement and tabulate pump motor voltage, motor operating current, pump head with no flow and with full flow. Submit manufacturer's pump curves, indicating operating point of each pump.
- g. Set minimum outside air damper position by relationship to mixed air temperature.
- h. Calibrate all temperature control and other automatic devices and thoroughly test. Guarantee all instruments to function on a variation of $\pm 1\frac{1}{2}^{\circ}$ and make adjustments to achieve this result during first year without cost to Owner.
- i. Furnish 5 AABC or NEBB certified copies of balancing results.
- j. Perform a "spot" recheck of balancing conditions between 30 to 90 days after balancing operations jointly with a representative of the temperature control manufacturer, who is capable of making adjustments to the temperature control system. Include a check of space temperatures, calibration of controls, pump heads, fan performance, and any adjustments, thereto. Submit written report to Architect.
- k. After or during one complete heating/cooling season, make any minor adjustments that may be necessary to insure uniform temperatures throughout the space.

END OF SECTION

SECTION 15020

BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.1 WORK INCLUDES

- A. Thermometers
Pressure Gauges
Combination Pressure and Temperature Test Plugs
Sleeves
Inserts, Hangers and Supports
Fire Stopping
Electrical Connections
Motors
Drives and Guards
Vibration and Noise Control

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 15010 - Basic Mechanical Requirements.
- B. Section 15210 - Insulation.
- C. Section 15710 - Hydronic Piping.
- D. Section 15720 - Heat Transfer Equipment
- E. Section 15810 - Air Distribution.
- F. Section 15910 - Controls and Instrumentation.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01300.

1.4 DRAWINGS INTERPRETATION

- A. The drawings are essentially diagrammatic to the extent that offsets, ends, special fittings and exact locations are not indicated.
- B. Attention is called to the limited space available for the installation of mechanical services, it is essential for the coordination of all trades that this Contractor be responsible for confirming the location and elevations of his piping and equipment at the job site to avoid encroaching upon the space needed and allocated from another trade.

- C. Drawings are not intended to be scaled for roughing in measurement or to serve as shop drawings, installation drawings or sleeve drawings. "Working Plans" for these purposes shall be prepared by the Contractor.

PART 2 PRODUCTS

2.1 THERMOMETERS

- A. Acceptable manufacturers:

1. American Consolidated.
2. Taylor.
3. Trerice.
4. Weiss Instruments.

- B. Provide thermometers in piping at the following locations:

1. Heating supply and return mains.
2. Where additionally shown on drawings.

- C. Thermometers: Mercury in glass type with 9" Fahrenheit scale of proper range for service indicated, glass covered case with magnified mercury column, separable well, straight or angle mounted as required.

1. Bi-metal dial type thermometers may be supplied in lieu of mercury type.
2. Thermometers below 6'-0" level: Mercury type with 9" scale, forward or straight type as required by job conditions. Thermometers serving locations above 6'-0" level to be dial type with remote bulb. Mount 4" diameter dials 5'-6" above floor on bracket at appropriate location.

2.2 PRESSURE GAUGES

- A. Acceptable manufacturers:
 - 1. American Consolidated.
 - 2. Ashcroft.
 - 3. Marsh.
 - 4. Trerice.
- B. Provide a steam gauge ahead of and after each pressure reducing valve. Install gauges in the suction and discharge of the heating pumps, condenser water pumps, chilled water pumps, and all pumps on plumbing system. Provide gauges having proper ranges as required by conditions. Gauges to have 6" dial, cocks, snubbers, and siphons.

2.3 FOUNDATION PAD

- A. Except where otherwise noted, provide foundations for all floor mounted equipment installed under this Division.
- B. Construct foundations of 3,000 pound concrete complete with all necessary foundation bolts, sleeves anchor plates, washers and nuts. Smooth all exposed portions of foundations and bevel corners.
- C. Unless otherwise noted on Drawings, make all foundation a minimum of 4" thick.

2.7 SLEEVES

- A. Where pipes pass through masonry or concrete walls, set machine cut steel pipe sleeves 1" larger than outside diameter of pipe, with ends of sleeves flush with wall faces. Sleeves in partitions other than masonry or concrete shall be 22 ga. galvanized steel sheet.
- B. Where pipes pass through floors, set Schedule 40 galvanized steel pipe sleeves 1" larger than O.D. of pipe. Top of sleeve to be 4" above finished floor in machine rooms and wet floor locations.
- C. Where pipes are insulated, provide sleeves large enough to allow insulation to pass through sleeve. Center pipes in sleeves.
- D. Set sleeves true to line, grade position and plumb or level and so maintain throughout construction period.
- E. Where concrete or masonry floors and walls are core drilled for pipe passage steel sleeves are not required.

- F. Seal opening between pipe and sleeve or opening as required to maintain the integrity of the fire rating of all walls and floors. Use 3M fire barrier sealing system; Caulk CP25, Putty 303, Dow Corning Fire Stop System is acceptable.
- G. Where pipes pass through exterior walls below grade, set Schedule 40 steel pipe or manufactured castings or sleeves 1 ½” larger than O.D. of pipe. The pipe to wall penetration closure shall be made with “Link-Seal” as manufactured by the Thunderline Corporation.

2.8 INSERTS, HANGERS, AND SUPPORTS

- A. Acceptable manufacturers:
 - 1. Grinnell.
 - 2. Michigan.
- B. Provide all inserts, hangers, anchors, guides and supports to properly support and retain piping, ductwork, conduits and equipment; to control expansion, contraction, anchorage, drainage and prevent sway and vibration. Piping shall be so supported as not to place a strain on valves or equipment.
- C. Provide:
 - 1. Inserts for support of work in concrete construction.
 - 2. Forged steel beam clamps when attaching to steel construction.
 - 3. Supplementary angles, channels, plates, etc. Where supports are required between building structural members, span the space and attach to building structural members by welding, bolting or with concrete anchors.
 - 4. Rods, angles, rails, struts, brace plates, platforms, etc., required for suspension or support of piping, conduit and equipment.
 - 5. Hangers, rollers, threaded rods, turnbuckles, saddles, insulation protectors, anchors, etc., and all miscellaneous specialties for the attachment of hangers and supports to the structure.
- D. Support individual piping from hangers:
 - 1. Uninsulated piping ½ to 1 ½ inch – Carbon steel, adjustable swivel ring, Grinnel Figure #70.
 - 2. Uninsulated piping 2” and larger – Carbon steel, adjustable, clevis, Grinnel Figure #260.
 - 3. Copper tubing (uninsulated) - Carbon steel ring and malleable iron adjusting nut completely copper plated, Grinnell Figure CT-70.
 - 4. Insulated piping ½ to 1 ½ inch - 18 ga. galvanized steel shield over insulation in 180° segments, minimum 12" long with Grinnell Figure #260 clevis type pipe attachment.
 - 5. Insulated piping 2” and over (except cold piping) - Use pipe covering protection saddle. Support clevis type except where roller support required, Grinnell Figure #260.
 - 6. Rollers - Where thermo movement causes a hanger rod to deviate more than 5° from the vertical or where longitudinal expansion may cause a movement of more than ½" in the piping, use and install roller hangers or chairs, Grinnell Figure 181, 171, or 175.

E. Hanger Spacing:

1. Steel Pipe:

PIPE SIZE (INCHES)	MAXIMUM HANGER SPACING (FEET)	MINIMUM ROD DIAMETER (INCHES)
1/2	5	3/8
3/4	6	3/8
1 and 1 ¼	7	3/8
1-1/2	9	3/8
2	10	3/8
2-1/2	11	1/2

2. Copper Pipe:

PIPE SIZE (INCHES)	MAXIMUM HANGER SPACING (FEET)	MINIMUM ROD DIAMETER (INCHES)
1/2 and 3/4	5	3/8
1 and 1 ¼	6	3/8
1 ½ and 2	8	3/8

- F. Provide additional lock nut on each threaded support rod.
- G. Provide additional hanger support within two feet of each elbow and at valves, strainers and other equipment in pipe lines.
- H. Copper pipe shall be supported at intervals of not over 10 feet for 1½" and larger, and not over 5 feet for 1¼" and smaller. Additional supports shall be provided where necessary to maintain proper alignment.
- I. Sanitary drain and vent and storm drain piping hung from building construction shall be supported at intervals of not over 4 feet next to joint. Additional supports shall be provided where necessary to maintain proper alignment and grade.
- J. Support vertical pipe risers with friction clamps at least at alternate floors.
- K. Trapeze hangers may be used for multiple runs of piping and shall consist of a channel with adjustable hanger rods. Hanger spacing shall be determined by the smallest pipe supported. All piping shall be free for independent movement on the trapeze hanger. Insulation protection saddles shall be as specified for individual pipe support.
- L. Do not suspend a pipe from another pipe or ductwork. Do not support ceiling framing or lighting from piping or ductwork.
- N. Support ductwork with 16 ga. galvanized steel strap hangers, steel rods, or steel angle trapeze

hangers per SMACNA standards. Maximum spacing 8'-0".

2.11 FIRE STOPPING

- A. Seal openings of fire rated construction with a material or product that has been tested at an independent testing laboratory, such as UL, FM, etc. Fire stopping shall conform to ASTM E-814 and UL 1479, with fire ratings equal to or exceeding the fire rating of the construction involved. Fire stopping shall be UL classified, and shall be similar to the 3M brand Fire Barrier Penetration Sealing Systems, or approved equivalent. Fire stopping of this type shall also be utilized for openings through smoke rated construction. To conform with BOCA Basic Building Code Standards.
- B. If desired by the Contractor and approved by local codes, the "Pro-Set" piping penetration system also may be utilized. Penetration system shall be UL certified and shall be the "Pro-Set" System A. Firestop coupling (sleeve) shall be filled with ceramic fiber material to provide insulation and fire stopping. System shall be capable of maintaining a 3-hour fire rating. Penetration system shall be secure, waterproofed, fire rated and smoke proof and shall allow for pipe expansion and contraction.

2.12 ELECTRICAL CONNECTIONS

- A. Refer to those portions of the Electrical Drawings and Specifications which establish characteristics of electrical service and furnish equipment to operate on that service.
- B. The Electrical Contractor shall furnish all starters unless otherwise noted. Starters to be provided with proper NEMA enclosures, surface or flush application as required. Where equipment has magnetic starters furnished as an integral part of the equipment, the Electrical Contractor shall furnish necessary disconnect switches.
- C. Provide coordinated wiring diagrams for motor equipment of heating, ventilating, air conditioning, plumbing and temperature control conforming to system operation specified. Provide line diagrams, power diagrams, terminal connections. Submit all such drawings as shop drawings.

2.13 DRIVES AND GUARDS

- A. For each item of belt driven equipment, provide an adjustable drive sheave with adjustable limits $\pm 12\frac{1}{2}\%$, based on a service factor of 1.5 as applied to motor nameplate rating. Drives of one horsepower and over shall have at least two belts, with all multiple belt sets matched. Non-adjustable drive sheaves will be acceptable for motors of 30 HP and over.
- B. Provide substantial drive guard for each belt drive secured to the equipment. Provide openings in skirt guards for insertion of revolution counter at drive sheave and driven sheave centers. Provide conveniently removable coupling guard for direct driven equipment. All equipment guards shall conform with OSHA requirements.
- C. For each item of direct driven equipment which is not of extended shaft or close coupled design,

provide an approved type flexible coupling.

- D. Provide a typed list of belt drives, listing each item with pitch diameter, bore size, and key way dimensions of each sheave and manufacturer's replacement belt numbers. Bind lists in Operating and Maintenance Manuals.
- E. Provide all necessary changes in drive sheaves and/or belts as required to obtain specified air deliveries.

2.15 VIBRATION AND NOISE CONTROL

- A. All equipment shall operate without objectionable noise or vibrations within Noise Criteria Curves listed in Sound Control Fundamentals of the latest edition of the ASHRAE Handbook of Systems and Application. Sound and vibration measurements shall conform with the ASHRAE Handbook of Fundamentals. If such objectionable noise or vibration shall be produced and transmitted to occupied portions of the building by apparatus, piping, ducts or other parts of this work, any necessary changes, as approved, shall be made without cost to the Owner. Noise levels shall conform with the requirements of OSHA.
- B. Where pipes or duct or other component pass through non-fire rated walls or floors, but walls which extend from horizontal structure to structure, provide sound stopping between such mechanical work and the building structure intended to reduce the transmission of sound from one side of the wall to the other.
- C. Furnish and install vibration isolating mountings to isolate from the structure, by means of resilient vibration and noise isolators, mechanical equipment having rotating or reciprocating parts. Isolators shall be guaranteed by the manufacturer to provide isolation efficiencies in accordance with this Specification. Selection shall be based on equipment purchased, power dissipated, frequency, weight distribution and nature of the building structure. Mountings shall be designed to permit attachment to the equipment base or pad and to the structure and shall be selected for uniform deflection allowing for unequal weight distribution.
- D. Vibration or noise created in any part of the building by the operation of any equipment furnished and/or installed under this Contract will be prohibited and this Contractor shall take all precautions by isolating the various items of equipment from the building structure.
- E. Mechanical equipment shall be isolated as follows:
 - 1. Isolate each base mounted pump from the piping systems by use of appropriate size reinforced neoprene connectors type MFTNC twin sphere connector manufactured by Mason Industries, Keflex Mfg., or Flexonics.
 - 2. Centrifugal fans, air conditioning and/or heating and ventilating units shall be mounted on stable steel springs, in series with ribbed rubber isolators. If the drive motor is not supported directly on the fan, both units shall be mounted on an integral structural steel base supplied by the isolator manufacturer, of sufficient rigidity to maintain alignment between the fan and the drive motor. The base shall, in turn be mounted on steel spring

isolators sized to provide minimum of 90% effective isolation.

3. Centrifugal fans, air conditioning, and/or heating and ventilating units ceiling suspended shall be suspended by threaded rods from the overhead structure. Resilient hangers incorporating steel springs and precompressed molded fiberglass inserts shall be incorporated into each supporting rod. The isolators shall be sized to provide minimum of 90% effective isolation.

G. Piping and ductwork shall be supported independently of the mechanical equipment and shall be isolated as follows:

1. All suspended piping in Mechanical Equipment Rooms and the first three hangers outside equipment rooms shall be supported from the overhead structure by threaded rods incorporating resilient hangers. Hangers shall contain steel springs and precompressed molded fiberglass inserts designed for static deflections of between 1" and 1¾" under operation conditions.
2. Flexible connections shall be used between ductwork and air handling equipment, and the ductwork attached rigidly to the structure.

H. Isolation efficiency shall be based on the lowest operating speed of the supported equipment. The isolator manufacturer shall provide, as a part of his submittal data, deflections and isolating efficiencies for the isolators supporting each piece of equipment. Isolators shall be manufactured by Mason Industries, Consolidated Kinetics or Amber Booth.

2.16 ELECTROLYSIS CONTROL

- A. The installation of copper tubing shall be accomplished in such a way as not to touch or come in contact in any way with ferrous metal. Where copper tubing, piping or fittings are anchored, supported or may come in contact with metal construction, an insulating non-conductor spacer similar to lead, rubber, fiber or plastic shall be installed to assure prevention of electrolysis.
- B. Hangers supporting copper tubing shall be copper, copper plated or be large enough to accommodate the insulating pipe covering. Copper tubing lines shall not be (even temporarily) supported or secured to ferrous metal.
- C. Connections between ferrous and copper piping shall be with dielectric fittings.

PART 3 EXECUTION

3.1 WELDING

- A. Install all pressure piping systems to conform to requirements of State Piping and Welding Codes where applicable.
 1. Any pipe welding not covered by code shall also be performed by certified welders according to code procedures.

2. Construct, install, and inspect all pressure piping systems in accordance with the requirements ASME B31.1.0 1967 and local code requirements.

3.2 EXPANSION LOOPS AND FLEXIBLE CONNECTORS

- A. Install all piping throughout the project with adequate allowance for expansion to prevent damage to building, equipment and piping. Provide anchors, loops, or approved type expansion joints as required for complete control of movement. Make changes in directions with fittings.
 1. Make branch connections to mains for heating risers, radiators, and domestic hot water risers with at least two (2) 90° elbows.
 2. Bullhead connections in any piping service are prohibited.
 3. Supplement all loops, joints, compensators, etc. with adequate guides located as close to loops and joints as possible to preserve alignment and pitch.
 4. Provide securely supported pipe anchors as required to control expansion, contraction in piping. Anchors and guides shall be constructed of structural members, standard weight pipe and steel plates. Members shall be properly welded together with all corners mitered. Anchors and guides shall be bolted to structural members or joists and isolated as required with spring isolators. Anchors, guides and expansion loops shall be installed to provide for proper expansion of piping and as approved by the Engineer.
 5. Flexible pipe connectors shall be full size of pipe and shall have stainless steel bellow with stainless steel wire braiding and flanged ends. Connectors shall be floated free of any pipe or equipment weight and shall be so designed to minimize pipe vibrations and harmonic hums.

3.3 MISCELLANEOUS IRON WORK

- A. Furnish and install all miscellaneous iron work including, but not limited to, piping hangers, piping anchors and guides, ductwork supports, air handling unit supports, and all other equipment supports. All additional structural members shall be furnished and installed to support the heating, ventilating and air conditioning equipment without excessive stress or strain on the building construction. Structural beams and other structural members shall be furnished and installed under this Contract for anchors and guidelines where the building steel is not available or capable of supporting or anchoring pipe lines and equipment.
- B. All equipment and materials furnished and installed under this Contract which are not mounted on bases or floors shall be securely attached and supported from the main supporting structure of the building by metal hangers, clamps and/or brackets. Metal hangers, clamps and/or brackets shall be of suitable design and of sufficient strength to properly and safely support the materials and equipment involved. Lag screws and bolts shall be used where required at wood construction.
- C. Where piping ductwork or other equipment pass through fire or smoke barrier stops, walls, floors

or ceilings, this Contractor shall furnish and install sleeves and shall thoroughly seal openings around sleeves, pipes, etc., with fire and smoke resistant materials. Materials shall be provided by this Contractor as required to maintain the fire rating of the walls, partitions, ceiling and floors in accordance with the requirements of NFPA.

END OF SECTION

SECTION 15210

INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Piping insulation.
- B. Jackets and accessories.
- C. Covering.
- D. Ductwork insulation.
- E. Insulation jackets.

1.2 RELATED SECTIONS

- A. Section 07270 – Firestopping.
- B. Section 15710 – Hydronic Piping: Placement of hangers and hanger inserts.
- C. Section 15810 – Air Distribution.
- F. Division 7 – Thermal and Moisture Protection.

1.3 REFERENCES

- A. ASTM C553 – Standard specification for mineral fiber blanket thermal insulation for commercial and industrial applications.
- B. ASTM C612 – Standard specification for mineral fiber block and board thermal insulation.
- C. ASTM C1071 – Standard specification for thermal and acoustical insulation (glass fiber, duct lining material).
- D. NFPA 255 – Standard method of test of surface burning characteristics of building materials.
- E. SMACNA – HVAC Duct Construction Standards – Metal and flexible.
- F. UL 723 – Standard for test for surface burning characteristics of building materials.

1.4 SUBMITTALS

- A. Section 01300 – Submittals: Procedures for submittals.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service and locations.
- C. Manufacturer’s Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to maximum flame spread/smoke developed rating of 25/50 in accordance with ASTM E84, NFPA 255 and UL 723.

1.7 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 – Material and Equipment: Transport, handle, store and protect products.
- B. Accept materials on site in original factory packaging labeled with manufacturer’s identification, product density and thickness.
- C. Protect insulation from weather and construction traffic, dirt, water, chemical and mechanical damage, by storing in original wrapping.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesive, mastics, insulation cements, etc.
- B. Maintain temperature before, during and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.1 PIPE INSULATION

- A. Glass Fiber: Heavy density, one piece construction.
 - 1. Acceptable manufacturers:
 - a. Owens-Corning Model SSL II, all service jacket.
 - b. Knauf.
 - c. Schuller.
 - 2. Insulation: ASTM C547 and ASTM C795; rigid molded, non-combustible:
 - a. ‘K’ Value: ASTM C177, 0.24 at 75 degrees F.
 - b. Maximum service temperature: 850 degrees F.
 - c. Maximum moisture absorption: 0.2 percent by volume.
 - 3. Vapor Barrier Jacket:

- a. ASTM C921, white kraft paper with glass fiber yarn, bonded to aluminized film.
 - b. Moisture Vapor Transmission: ASTM E96; 0.02 perm-inches.
- 4. Tie Wire: 0.048 inch, stainless steel with twisted ends on maximum 12 inch centers.
 - 5. Adhesives/mastic shall be applied as per the manufacturer's recommendations.
 - 6. Service:

Thickness Type

Heating Water C

- 7. Minimum Insulation Thickness Schedule:

Thickness Type	PIPE SIZE				
	TO 1"	1 ¼" – 2'	2 ½" – 4"	5" – 6"	ABOVE 6"
C	1"	1"	1"	1"	1 ½"

B. Cellular Foam: 1/2" thick

- 1. Acceptable manufacturers:
 - a. Armstrong, Model AP Armaflex.
 - b. Insultube.
 - c. Rubatex.
- 2. Insulation: ASTM C534; flexible, cellular elastomeric, molded or sheet.
 - a. 'K' Value: ASTM C177; 0.27 at 75 degrees F.
 - b. Minimum Service Temperature: -40 degrees F.
 - c. Maximum Service Temperature: 220 degrees F.
 - d. Maximum Moisture Absorption: ASTM D1056; 5.0 percent (pipe) by volume, 6.0 percent (sheet) by volume.
 - e. Moisture Vapor Transmission: ASTM E96; 0.10 perm-inches.
 - f. Connection: Waterproof vapor barrier adhesive.
- 3. Elastomeric Foam Adhesive shall be applied as per manufacturer's recommendations
- 4. Service:

Service

Air conditioning condensate drain within air conditioning unit cabinets.
Refrigerant suction.

C. Jackets:

1. PVC Plastic
 - a. Acceptable manufacturers:
 - 1) Knauf.
 - 2) Owens-Corning.
 - 3) Schuller.
 - b. Jacket: ASTM D1784, one piece molded type fitting covers and sheet material, off-white color.
 - 1) Minimum Service Temperature: 0 degrees F.
 - 2) Maximum Service Temperature: 220 degrees F.
 - 3) Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
 - 4) Thickness: 30 mil.
 - 5) Connections: Brush on welding adhesive tacks or pressure sensitive color matching vinyl tape.
 - c. Covering adhesive mastic shall be applied as per the manufacturer's recommendations.

2.2 DUCT INSULATION

A. Glass Fiber, Flexible: 1 ½" and 2" thick

1. Acceptable manufacturers:
 - a. Owens Corning, Model Type 100.
 - b. Knauf.
 - c. Schuller.
2. Insulation: ASTM C553; flexible, noncombustible blanket.
 - a. 'K' Value: ASTM C518, 0.27 at 75 degrees F.
 - b. Maximum Service Temperature: 250 degrees F.
 - c. Maximum Moisture Absorption: 0.20 percent by volume.
3. Vapor Barrier Jacket:
 - a. Kraft paper with glass fiber yarn and bonded to aluminized film, 0.0032 inch vinyl.
 - b. Moisture Vapor Transmission: ASTM E96; 0.02 perm.
 - c. Secure with pressure sensitive tape.
4. Vapor barrier tape shall be applied as per the manufacturer's recommendations.
5. Outdoor vapor barrier mastic shall be applied as per the manufacturer's recommendations.

6. Tie Wire: Annealed steel, 16 gage.
7. Service (1 ½” thick):
 - Concealed supply air ductwork
 - Concealed outside air intake ductwork

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01039 – Coordination and Meetings: Verification of existing conditions before starting work.
- B. Verify that piping has been tested before applying insulation materials.
- C. Verify that surfaces are clean and dry, with foreign material removed.

3.2 GENERAL INSTALLATION

- A. Section 01400 – Quality Control: Manufacturer’s instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. All insulation shall be installed over clean, dry surfaces. Insulation must be dry and in good condition. Wet or damaged insulation will not be acceptable. No insulation shall be applied prior to pressure test completion of the respective piping system.
- D. Exposed Piping and Equipment: Locate insulation and cover seams in least visible locations.
- F. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor PVC jacket and fitting covers
- G. Repair existing pipe, duct and equipment insulation where removed; to make new connections, to add temperature controls, or where damaged by new construction. Insulation shall be the same as specified for new service.
- H. Where existing asbestos insulation is discovered or suspected, notify the building Owner immediately so it can be removed under a separate “Asbestos Removal Contract” direct with the Owner.

3.3 PIPE INSULATION INSTALLATION

- A. Insulated Pipes Conveying Fluids Below Ambient Temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies and expansion joints.
- C. For hot piping and equipment containing fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

D. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.

E. Glass fiber insulated pipes containing fluids above ambient temperature:

1. Provide standard jackets, with or without vapor barrier, factory applied or field applied. Secure with self sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
2. Insulate fittings, joints and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
3. Finish equipment insulation with glass cloth and adhesive.

F. Inserts and Shields:

1. Application: Piping 3 inch diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert Location: Between support shield and piping and under the finish jacket.
4. Insert Configuration: Minimum 12 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert Material: Hydrous calcium silicate insulation or Perlite.
6. Insulation inserts shall not be less than the following lengths:

1-½ to 2-½ pipe size	10" long
3" to 6" pipe size	12" long
8" to 10" pipe size	16" long
12" and over	22" long

G. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints and valves with insulation of like material and thickness as adjoining pipe and finish with glass mesh reinforced vapor barrier cement. Cover with caulked [aluminum] [stainless steel] jacket with seams located on bottom side of horizontal pipe, equipment and ductwork.

END OF SECTION

SECTION 15710
HYDRONIC PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe and pipe fittings for:
 - 1. Heating water piping system.
 - 2. Refrigerant piping,
- B. Valves:
 - 1. Ball valves.
 - 2. Balancing valves.
 - 3. Check valves.
- C. Hydronic specialties.

1.2 RELATED SECTIONS

- A. Section 15010 – Basic Mechanical Requirements.
- B. Section 15020 – Basic Materials and Methods.
- C. Section 15210 – Insulation.
- D. Section 15720 – Heat Transfer Equipment.
- E. Section 15810 – Air Distribution.

1.3 REFERENCES

- AF. ASME B31.9 – Building Services Piping.
- G. ASTM A53 – Pipe, Steel, Black and Hot-Dipped, Zinc Coated Welded and Seamless.
- H. ASTM A234 – Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.

1.4 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified, ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union and couplings for servicing are consistently provided.
- B. Use grooved mechanical couplings and fasteners in accessible locations.

- C. Use unions, flanges and couplings downstream of valves and at equipment or apparatus connections. Do not use direct welded or threaded connections to valves, equipment or other apparatus.
- D. Use non-conducting dielectric connections whenever jointing dissimilar metals in open systems.
- E. Provide pipe hangers and supports as specified unless indicated otherwise.
- F. Use ball or butterfly valves for shut-off and to isolate equipment, part of systems or vertical risers.
- G. Use balancing valve for throttling, bypass or manual flow control services.
- H. Use spring loaded check valves on discharge of pumps.
- I. Use only butterfly valves in chilled and condenser water systems for throttling and isolation equipment.
- J. Use lug and butterfly valves to isolate equipment.
- K. Use ¾ inch gate or ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers and at equipment. Pipe to nearest floor drain where applicable.
- L. All refrigeration piping and accessories shall be installed in accordance with manufacturers recommendations .

1.5 SUBMITTALS

- A. Submit under Provision of Section 01300.
- B. Product Data: Include data on pipe materials, pipe fittings, valves and accessories. Provide manufacturers catalog information.

1.6 REGULATORY REQUIREMENTS

- A. Conform to ASME B31.9 code for installation of piping system.
- B. Welding Materials and Procedures: Conform to ASME SEC 9 and applicable state labor regulations.
- C. Provide certificate of compliance from authority having jurisdiction indicating approval of welders.

PART 2 PRODUCTS

2.1 HEATING WATER PIPING, ABOVE GROUND

- A. Steel Pipe: ASME A53, Schedule 40, black.
 - 1. Fittings: ASTM B16.3, malleable iron or ASTM A234, forged steel welding type fittings.
 - 2. Joints: Threaded, or AWS D1.1, welded.
- B. Copper Tubing: ASTM B88, Type L, hard drawn.
 - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22, solder wrought copper.
 - 2. Tee Connections: Mechanically extracted collars with notched and dimpled branch type.
 - 3. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony or tin and silver with melting range 430 to 535 degrees F or braze, AWS A5.8 BcuP silver/phosphorus/copper alloy with melting range 1190-1480 degrees F.

2.2 REFRIGERANT PIPING

- A. Copper Tubing (1 Inch and Over): ASTM B280, Type ACR hard drawn.
 - 1. Fittings: ASME B16.22 wrought copper.
 - 2. Joints: Braze, AWS A5.8 BcuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.
- B. Copper Tubing Up To 7/8 Inch OD: ASTM B88, Type K, annealed.
 - 1. Fittings: ASME B16.26 cast copper.
 - 2. Joints: Flared.

2.3 BALL VALVES

- A. Up To and Including 2 Inches:
 - 1. Acceptable manufacturers:
 - a. Grinnell.
 - b. Milwaukee.
 - c. Nibco.
 - d. Victaulic.
 - 2. Bronze, two piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder, threaded or grooved ends with union.
- B. Over 2 Inches:

1. Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle, flanged.

2.4 BALANCING VALVE

A. Acceptable manufacturers:

1. Armstrong.
2. Tour and Anderson.

B. Balancing valve to be supplied with two ¼” NPT brass metering ports. Valves shall provide multi-turn, 360 degree adjustment with a micrometer type indicator located on valve handwheel. Valve handwheel shall have hidden memory feature which shall provide a means for locking the valve after the system is balanced.

C. Up to and including 2”:

1. Valve body shall be bronze, Y-pattern and rated at 300 psi. Valve shall have a minimum of four 360 degree handwheel turns.

D. 2-½” through 12”:

1. Valve body shall be ductile iron with industrial standard grooved or flanged ends. Valve stem and plug disc shall be bronze with ergonomically designed handwheel and multi-turn handwheel adjustments.

2.5 SWING CHECK VALVES

A. Up To and Including 2 Inches:

1. Acceptable manufacturers:

- a. Grinnell.
- b. Milwaukee.
- c. Nibco.

2. Bronze body, bronze trim, bronze rotating swing disc, with composition disc, solder or threaded ends.

B. Over 2 Inches:

1. Acceptable manufacturers:

- a. Grinnell.
- b. Milwaukee.
- c. Nibco.

2. Iron body, bronze trim, bronze or bronze faced rotating swing disc, renewable disc and seat, flanged ends.

2.23 DIAPHRAGM-TYPE EXPANSION TANKS

- A. Acceptable manufacturers:
 - 1. Armstrong.
 - 2. Bell & Gossett.
 - 3. Taco.
- B. Construction: Welded steel, tested and stamped in accordance with ASME SEC 8-D; supplied with National Board Form U-1, rated for working pressure of 125 PSIG with precharge flexible EPDM diaphragm sealed into tank.
- C. Accessories: Pressure gage and air-charging fitting, tank drain; lifting rings and ring base.
- D. Automatic Cold Water Fill Assembly.

2.24 AIR VENTS

- A. Manual Type: Short vertical sections of 2 inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.
- B. Automatic Air Vent (Float Type):
 - 1. Acceptable manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco.
 - 2. Brass or cast iron body, copper, polypropylene or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.

2.25 AIR SEPARATORS

- A. Dip Tube Fitting:
 - 1. Acceptable manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco.
 - 2. For 125 psig operating pressure; to prevent free air collected in boiler from rising into system.

B. In-Line Air Separators:

1. Acceptable manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco.
2. Cast iron for sizes 1-½ inch and smaller, or steel for sizes 2 inches and larger; tested and stamped in accordance with ASME SEC 8-D; for 125 psig operating pressure.

2.26 STRAINERS

A. Size 2 Inches and Under:

1. Acceptable manufacturers:
 - a. Clark-Reliance.
 - b. Mueller.
 - c. Sarco.
2. Screwed brass or iron body for 175 psig working pressure, Y pattern with 1/32 inch stainless steel perforated screen.

B. Size 2-½ Inches to 4 Inches:

1. Acceptable manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco.
2. Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.

C. Size 6 Inches and Larger:

1. Acceptable manufacturers:
 - a. Armstrong.
 - b. Bell & Gossett.
 - c. Taco.
2. Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.

2.27 PUMP SUCTION FITTINGS

A. Acceptable manufacturers:

1. Armstrong.
 2. Bell & Gossett.
 3. Taco.
- B. Fitting: Angle pattern, cast-iron body, threaded for 2 inches and smaller, flanged for 2 ½ inches and larger, rated for 175 psig working pressure, with inlet vanes, cylinder strainer with 3/16 inch diameter openings, disposable fine mesh strainer to fit over cylinder strainer, and permanent magnet located in flow stream and removable for cleaning.
- C. Accessories: Adjustable foot support, blowdown tapping in bottom, gage tapping in side.

2.28 COMBINATION PUMP DISCHARGE VALVES

- A. Acceptable manufacturers:
1. Armstrong.
 2. Bell & Gossett.
 3. Taco.
- B. Valves: Straight or angle pattern, flanged cast-iron valve body with bolt-on bonnet for 175 psig operating pressure, non-slam check valve with spring-loaded bronze disc and seat, stainless steel stem and calibrated adjustment permitting flow regulation.

2.30 THERMOSTATIC VALVES

- A. Acceptable manufacturers:
1. Danfoss.
 2. Spirax Sarco.
 3. Sterling.
 4. Taco.
- B. Operator shall have built in sensor and be installed in convactor cabinet, concealed with lockable access door.
- C. The thermostatic valve shall maintain room temperature within $\pm 1^\circ$ F. The operator shall be of the bellows design with either a liquid or vapor charge. The operator shall be capable of temperature adjustment between 45° and 86° F.
- D. Locking or limiting of the temperature shall be accomplished by the use of limiting pins or rings. The valve shall be of nickel plated brass construction with a fully replaceable packing gland. The gland shall be replaceable while the system is in full operation due to a valve back seat gasket.

- E. The valve disc shall be constructed of EDPM capable of withstanding 250° F temperatures.

2.31 RELIEF VALVES

- A. Acceptable manufacturers:
 - 1. Bell & Gossett.
 - 2. McDonnell Miller.
 - 3. Watts.
- B. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. After completion, fill, clean and treat systems.

3.2 GENERAL PIPING

- A. Provide shut-off valves at all branch connection to main, at all fixture groupings, each piece of apparatus and in mains to sectionalize the systems and elsewhere as indicated.
- B. Install all valves with stems at or above horizontal position.
- C. Install all valves and equipment with unions or flanges to facilitate removal.
- D. Provide hose end drain valves at all low points, trapped sections and on equipment side of all branch valves to permit draining of all part of liquid piping systems. Install valves at high points of equipment and piping to allow venting.
- E. Group piping whenever practical at common elevation.
- F. Sleeve pipe passing through partitions, walls and floors.

- G. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.
- H. Pipe equipment drip bases to nearest drain.
- I. Locate covered piping a sufficient distance from walls, other pipe, ductwork or other obstacles, to permit application of the full thickness of insulation specified; if necessary, use extra fittings and pipe.
- J. Use Dielectric Connectors where pipe materials change from ferrous to copper in piping systems.
- K. Make piping connections to equipment indicated.
- L. Plug open ends of pipe or equipment at all times during installation to keep dirt and foreign material out of system.
- M. Arrange and install all pipes, valves, cleanouts, access openings and equipment so as to be accessible for service. Locate equipment to maintain clearances for tube, coil pulling and periodic servicing.
- N. Unless otherwise specified, branch connections in welded steel piping less than 2/3 of main size shall be made with weldolets, butt or threaded type. Branch connections 2/3 of main size and larger shall be with weld tees, laterals or crosses. Shaped nipples are not acceptable.
- O. Make reductions in piping with reducing coupling or weld fitting reducer.
- P. Provide inserts for placement in concrete formwork and for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

3.3 HOT WATER PIPING SYSTEMS

- A. Run mains in general as shown on drawings. Where piping is reduced in size, eccentric reducing fittings to align top of all mains shall be used to prevent air pockets. Branch connections from mains to risers, radiators or equipment below mains shall be taken from the bottom of the main and provided with at least three elbow joints for expansion. Supply run outs shall pitch down away from main 1" to 5'-0".
- B. Branch connections from mains to risers, radiators or equipment above mains shall be taken from the top of main. Supply runouts shall pitch up away from main 1" in 5'-0". Return runouts shall pitch down to main 1" in 5'-0". Mains to be provided with necessary loops or swing pieces where necessary to allow for expansion. Furnish and install hose end drain valves at all low points of the system.
- C. Install air vents at the high points in all pipe lines and in all equipment coils, unit heaters, convectors, finned tube radiators for complete air elimination from the system. Air vents are to be provided on supply mains or risers where indicated or otherwise needed due to rise in elevation of mains. All air vents shall be accessible for maintenance.

- D. Provide a shut-off valve in the supply to each heating coil, cooling coil, convector, finned tube radiator or unit heater and a balancing valve in the return line. Balancing device shall also serve as a shut-off valve.
- E. Provide a strainer in the suction line to each heating and cooling system water pump. Install a 3/4" blowoff valve on each strainer.
- F. Install heating and chilled water equipment and specialties in accordance with manufacturer's instructions.
- G. Provide air separator on suction side of system circulation pump and connect to expansion tank.
- H. Provide pump suction fitting on suction side of base mounted centrifugal pumps where indicated. Remove temporary strainers after cleaning systems.
- I. Provide combination pump discharge valve on discharge side of base mounted centrifugal pumps where indicated.
- J. Support pump fitting with floor mounted pipe and flange supports.
- K. Provide radiator valves on water inlet to terminal heating units such as radiation, unit heaters and fan coil units.
- L. Provide radiator balancing valves on water outlet from terminal heating units such as radiation, unit heaters and fan coil units.
- M. Provide relief valves on pressure tanks, low pressure side of reducing valves, heat exchangers and expansion tanks.
- N. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.
- O. Pipe relief valve outlet to nearest floor drain.
- P. Where on line vents several relief valves, make cross sectional area equal to sum of individual vent areas.

3.5 REFRIGERANT PIPING

- A. Refrigerant piping equipment installation shall conform to the applicable requirements of the Safety Code for Mechanical Refrigeration (ANSI B9.1) and the Ohio Basic Building Code.
- B. Piping and specialties shall be sized to prevent excessive pressure drop and allow compressors and evaporators to operate together with balance points at or above the specified capacities.

- C. Piping and specialties shall be arranged to return oil at all loads and prevent liquid from “slugging” the compressor or siphoning to the evaporator. Provide double suction risers and traps as required.
- D. Pitch horizontal refrigerant piping 1/2” per 10 feet in direction of flow.
- E. Provide separate refrigerant circuits for multiple compressor applications.
- F. Install refrigeration specialties in accordance with manufacturer’s instructions.
- G. Route piping in orderly manner, with plumbing parallel to building structure and maintain gradient.
- H. Install piping to conserve building space and not interfere with use of space. Group piping whenever practical at common elevations and locations.
- I. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.
- J. Provide clearances for installation of insulation and access to valves and fittings.
- K. Provide access to concealed valves and fittings.
- L. Flood piping system with nitrogen when brazing.
- M. Where pipe support members are welded to structural building frame, brush clean and apply one coat for zinc rich primer to welding.
- N. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.
- O. Provide replaceable cartridge filter-driers, with isolation valves and valved by-pass where indicated.
- P. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.
- Q. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator.
- S. Fully charge completed system with refrigerant after testing.
- T. Provide electrical connection to solenoid valves.

END OF SECTION

SECTION 15720

HEAT TRANSFER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pumps.
- B. Boilers
- C. Water Treatment
- D. Makeup Air Units
- E. Duct Furnaces
- F. Condensing Units
- G. Cabinet Unit Heaters
- H. Fintube Radiation

1.2 RELATED SECTIONS

- C. Section 15020 – Basic Materials and Methods
- D. Section 15710 - Hydronic Piping.
- H. Section 15810 – Air Distribution
- I. Section 16180 - Equipment Wiring Systems: Electrical characteristics and wiring connections.

1.3 REFERENCES

- E. AMCA 99 – Standards Handbook.
- F. AMCA 500 – Test Methods for Louvers, Dampers and Shutters.
- I. ANSI/ASME – Boilers and Pressure Vessels Code.
- J. ARI 210/240 – Unitary Air Conditioning and Air-Source Heat Pump Equipment.
- K. ARI 365 – Commercial and Industrial Unitary Air-Conditioning Condensing Units.
- R. ASHRAE 15 – Safety Code for Mechanical Refrigeration.
- S. ASME SEC 4 - Boiler and Pressure Vessel Codes - Rules for Construction of Heating Boilers.
- V. ASME SEC 8 - Boilers and Pressure Vessel Codes - Rules for Construction of Pressure Vessels.
- AA. NFPA 70 - National Electrical Code.

- BB. NFPA 90A – Installation of Air Conditioning and Ventilating Systems.
- CC. NFPA 90B – Installation of Warm Air Heating and Air Conditioning Systems.
- DD. SMACNA-HVAC Duct Construction Standards-Metal and Flexible.
- FF. UL – Underwriters Laboratory.

1.4 PERFORMANCE REQUIREMENTS

- A. Ensure equipment operates at specified capacities and within manufacturer’s limits without stress and strain on the associated equipment or systems.

1.5 SUBMITTALS

- A. Section 01300 Submittals: Procedures For Submittals.
- B. Product Data
 1. Provide certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.
 2. Provide chemical treatment materials, chemicals, and equipment including electrical characteristics and connection requirements.
 3. Provide equipment data indicating rated capacities, weights, accessories, general assembly connection requirements, valves, strainers, duct connections, miscellaneous components, controls, safety controls, etc. and wiring diagrams with electrical characteristics.
 4. Submit manufacturer’s installation instructions. Indicate assembly, support details, connection requirements, and start-up instructions.
- C. Shop Drawings: Indicate related clearances, system schematic, equipment locations, control schematics, refrigerant piping diagrams and connection requirements.
- D. Millwright’s Certificate: Certify that base mounted pumps have been aligned.
- E. Water Treatment Manufacturer’s Field Reports: Indicate start-up of water treatment systems when completed and operating properly. Indicate analysis of system water after cleaning and after treatment.
- F. Submit certificate of compliance from authority having jurisdiction indicating approval of chemicals and their proposed disposal.

- G. Boiler Manufacturer's Field Reports: Indicate specified performance and efficiency has been met or exceeded. Provide combustion test which shall include boiler firing rate, over fire draft, gas flow rate, heat input, burner manifold gas pressure, percent carbon monoxide (CO), percent oxygen (O), percent excess air, flue gas temperature at outlet, ambient temperature, net stack temperature, percent stack loss, percent combustion efficiency, and heat output.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01700.
- B. Equipment Operation and Maintenance Data: Include Manufacturer's descriptive literature, operating and installation instructions, assembly views, lubrication instructions, parts list, maintenance and replacement parts list.
- C. Include copies of all approved shop drawings, permits, field reports, miscellaneous approvals, etc.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacture, assembly, and field performance of specified equipment with minimum three documented years experience.
- B. Water treatment company shall have local representatives with water analysis laboratories and full time service personnel.

1.9 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by UL and/or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.
- B. Conform to applicable code for addition of non-potable chemicals to building mechanical systems and or to public sewage systems.
- C. Conform to applicable code and NFPA 70 for internal wiring of factory wired equipment.
- D. Conform to ASME SEC 4 and SEC 8D and AGA Z21.13 for boiler construction.
- E. Units AGA certified UL labeled.
- F. Conform to Section 8D of the ANSI/ASME Boilers and Pressure Vessels Code for manufacture of tubular heat exchangers and heat exchanger shells.

1.10 WATER TREATMENT MAINTENANCE SERVICE

- A. Furnish service and maintenance of treatment systems for one year from Date of Substantial Completion.
- B. Provide monthly technical service visits to perform field inspections and make water analysis on site. Detail findings in writing on proper practices, chemical treating requirements, and corrective actions needed. Submit two copies of field service report after each visit.
- C. Provide laboratory and technical assistance services during this maintenance period.
- D. Include two hour training course for operating personnel, instruction them on installation, care, maintenance, testing, and operation of water treatment systems. Arrange course at start up of systems.
- E. Provide on site inspections of equipment during scheduled or emergency shutdown to properly evaluate success of water treatment program, and make recommendations in writing based upon these inspections.
- F. Provide sufficient chemicals for treatment and testing during warranty period.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of Section 01700.
- B. Provide one set of mechanical seals for each pump.
- C. Provide one full set of belts for each belt driven piece of equipment.
- D. Provide one set of wrenches for plate type heat exchangers.
- E. Provide one full set of extra filters for each piece of equipment that utilizes throw away type filters.

1.12 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 – Material and Equipment: Transport, handle, store and protect products.
- B. Protect units before, during, and after installation from damage to equipment by leaving factory shipping packaging in place until immediately prior to final acceptance.
- C. Comply with manufacturers installation instructions for rigging, unloading and transporting units.
- D. Protect internals of coils, heat exchangers, etc. Front entry of foreign material by temporary caps on flanged openings.

1.13 WARRANTY

- A. Section 01700 – Contract Closeout. 01740 – Warranties and Bonds.
- B. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owners name and registered with manufacturer. Provide five year warranty for all compressors.

1.14 ENVIRONMENTAL REQUIREMENTS

- A. Do not operate air moving equipment until ductwork is clean, filters are in place, bearings lubricated and fan has been test run under observation.

PART 2 PRODUCTS

2.1 PUMPS

A. IN-LINE CIRCULATORS

- 1. Acceptable Manufacturers:
 - a. Armstrong
 - b. Bell and Gossett
 - c. Paco
 - d. Taco
- 2. Provide an in-line circulator having the capacities as scheduled on the drawings.
- 3. Type: Horizontal shaft, single stage, direct connected, with resiliently mounted motor for in-line mounting, oil lubricated, for 125 psig maximum working pressure.
- 4. Casing: Cast iron, with flanged pump connections.
- 5. Impeller: Stamped brass or cast bronze keyed to shaft.
- 6. Bearings: Two, oil lubricated bronze sleeves.
- 7. Shaft: Alloy or stainless steel with copper or bronze sleeve, integral thrust collar.
- 8. Seal: Carbon rotating against a stationary ceramic seat, 225 degrees F maximum continuous operating temperature.
- 9. Drive: Flexible coupling.

2.2 BOILERS

- A Boiler acceptable manufacturers: Peterson Kelly , Cleaver Brooks, Budurus, or approved equal
- B. Boilers shall be suitable for firing with natural gas utilizing a forced draft combustion system. Boilers shall be ASME rated for 160 psi working pressure.
- C The boiler shall have a full three pass fire tube design to allow complete combustion of the fuel in the main combustion chamber. All flue side surfaces, including the main combustion chamber, second and third flue passages shall be constructed of 316 stainless steel designed to maximize the condensate formation. All flue passages shall be fully water-backed to minimize thermal stresses on the boiler vessel.
- D Boiler shall be suitable to operate under any return water temperature, any boiler water flow rate and without any restrictions on temperature rise through the boiler vessel. Boiler shall be able to operate at efficiencies up to 98% at suitably low return water temperatures.
- E The condensing secondary and tertiary fire tube flue passages shall be fabricated from 316 stainless steel with a reduced cross section in the direction of flue products flow to maintain a near constant velocity of combustion products and to enhance micro turbulences for maximum heat transfer.
- F Boiler shall have an internal water baffle plate separating return water between second and third flue passages for maximum efficiency.
- G Boiler shall be fully serviceable from the front by means of a reversible swing burner door and removable access cover.
- H The boiler vessel shall be wrapped with a full 4” thermal insulation blanket for minimal stand-by loss.
- I The boilers shall include a natural gas modulating burner (shipped loose) to include the gas train (field assembled) with the appropriate components to meet the State Plumbing Code and insurance regulations.
- 1. Provide the following standard trim:
 - a) Aluminum Condensate Receiver Pan
 - b) Low Air Pressure Switch
 - c) Blocked Flue Detection Switch
 - d) Modulation Control
 - e) Temperature/Pressure Gauge
 - f) Manual Reset High Limit
 - g) Low Gas Pressure Safety Switch
 - h) Low Water Cutoff with Manual Reset (CSD-1)
 - i) Gas Pressure Regulator to provide 4” Incoming Pressure to Main Gas Valve – Shipped Loose for Field Installation.
 - j) Air inlet filter
 - k) Supply Outlet Temperature Display
 - l) Full Digital Text Display for all Boiler Series of Operation and Failures
 - m) Air Inlet Filter

- n) Condensate Drain
- o) High Gas Pressure Switch and Valve Proving Switch for IRI Compliant GasTrain

2. Boiler Controller

- a. Controls: The boiler control package shall be equipped with integrated boiler management system. The control system must be integral to each boiler.
 - a. The Boiler controller shall be capable of operating in the following ways:
 - As a stand-alone boiler control system using boiler controller protocol, with one "Master" and multiple "Member" units.
 - b. As a boiler network, enabled by a Building Management System (BMS), using the boiler controller open protocol for Bacnet.

2.7 AIR HANDLING UNITS

A. Acceptable manufacturers

- 1. Reznor
- 2. Carrier
- 3. York

B. Provide an air handling unit having the capacities as scheduled on the drawings.

C. Configuration::

- 1. Draw thru with fan section.
- 2. Combination filter/mixing box section.

D. Performance Base: Sea level conditions.

E. Fabrication: Conform to AMCA 99 and ARI 430.

F. Casing

- 1. Construction: Fabricate on channel base of welded steel. Assemble sections with gaskets and bolts.
 - a. Galvanized Steel: 16 gauge minimum.
- 2. Insulation: Neoprene coated, glass fiber, applied to internal surfaces with adhesive and weld pins with exposed edges of insulation coated with adhesive.
 - a. K value at 75 degrees F Maximum 0.26 Btuh/inch/sq. ft./degrees F.

- b. Density: One inch thick, 1-1/2 lbs/cu ft.
 - 3. Finish: Baked enamel.
 - 4. Inspection Doors: Full size of galvanized steel for flush mounting, with gasket, latch, and handle assembly.
- G. Fans
- 1. Type: Forward curved, type fan.
 - 2. Performance Ratings: Conform to AMCA 21 0 and label with AMCA Certified Rating Seal.
 - 3. Sound Ratings: AMCA 301; tested to AMCA 300 and label with AMCA Certified Sound Rating Seal.
 - 4. Bearings: Self-aligning, grease lubricated, ball or roller bearings with lubrication fittings extended to exterior of casing with copper tube and grease fitting rigidly attached to casing.
 - 5. Mounting: Locate fan and motor internally on welded steel base coated with corrosion resistant paint. Factory mount motor on slide rails. Provide access to motor, drive, and bearings through removable casing panels or hinged access doors.
 - 6. Mounting: Locate motor, drive, and belt guard on integral casing framework on exterior of casing.
- H. Bearings and Drives
- 1. Bearings: Heavy duty pillow block type, self-aligning, grease-lubricated ball bearings, with ABMA 9 L-50 life at 200,000 hours.
 - 2. Shafts: Solid, hot rolled steel, ground and polished, with key-way, and protectively coated with lubricating oil.
 - 3. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, bored to fit shafts, and keyed. Variable and adjustable pitch sheaves for motors 15 hp and under selected so required rpm is obtained with sheaves set at mid-position; fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.
 - 4. Belt Guard: Fabricate to SMACNA Standard; 0.106 inch thick, ¾ inch diamond mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.
 - 5. Fan motor shall be factory mounted on slide rails having adjustable screws. Motor shall be energy efficient, open drip-proof type.

K. Filters

1. Combination Filter/Mixing Box: Section with filter guides, access doors from both sides, for side loading with gaskets and blank-off plates.
2. Filter Media: UL 900 listed, Class I or Class II. Refer to Section 15810.

L. Dampers

1. [Combination Filter/Mixing Box] [Mixing Box]: Section with factory mounted outside and return air dampers of galvanized steel with vinyl bulb edging and edge seals in galvanized frame, with galvanized steel axles in self-lubricating nylon bearings, in opposed blade arrangement.

2.9 DUCTLESS SPLIT AIR CONDITIONING SYSTEM

A. Provide complete heat pump air conditioning system of types, sizes and capacities shown on schedules. System shall consist of number of zones as shown on the schedule and each shall consists of slim silhouette, wall mounted indoor fan coil sections with digital wireless remote controller and slim horizontal discharge outdoor unit which shall be of an inverter driven heat pump design. Provide complete piping, piping, controls, wiring and other accessories and appurtenances necessary to provide fully automatically functioning system.

B. Acceptable Manufacturers shall be:

1. Mr. Slim Mitsubishi Electric
2. Sanyo
3. Daiken Or equal

C. Indoor Unit

1. The indoor unit shall be fully factory assembled, wired and run tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor.

2. Unit Cabinet:

The casing shall have a white finish. Multi directional drain and refrigerant piping, offering three (3) direction pipe alignment for all refrigerant piping and two (2) direction pipe alignment for condensate draining shall be standard. There shall be a separate back plate that secures the indoor unit firmly to the wall.

3. Fan:

- a) The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.
- b) A integral, motorized, multi-position, vertical air sweep flow louver shall provide for uniform air distribution. Louver position shall be selectable from the remote controller. The indoor fan motor shall be capable of three (3) speed operation: High, Medium and Low.

4. Filter:

- a) Return air shall be filtered by means of an easily removed, washable, Catechin, Antioxidant Pre-filter and a separate Anti-allergy enzyme filter – blue bellows type.
5. Coil:
- a) The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
 - b) The refrigerant tubing shall have inner grooves for high efficiency heat exchange.
 - c) All tube joints shall be brazed with phoscopper or silver alloy.
 - d) A condensate pan and drain shall be provided under the coil.
6. Electrical:
- a) The indoor unit electrical power shall be 208 / 230 volts, 1-phase, 60 hertz.
 - b) The system shall be equipped with A-Control – a system allowing each indoor unit to be powered and controlled directly from the outdoor unit using a 14 gauge (AWG) 3-wire connection plus ground providing both primary power and integrated , by-directional, digital control signal without additional connections.
7. Control:
- a) The indoor unit shall have field installed hard-wired digital remote controller.
 - b) The remote controller shall provide a Power On/Off switch, Mode Selector – Cool-Dry-Heat, Temperature Setting, 24 Hour Clock / Timer Control, Fan Speed Select and Auto Vane selector.
 - c) The unit shall be compatible with interfacing with connection to LonWorks networks or interfacing with connection to BMS system
- D. Outdoor Units:
- General:
- The outdoor units shall be specifically designed to work with the family of indoor units. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory prior to shipment.
1. Unit Cabinet:
- a) All casing and cabinet components shall be fabricated of galvanized steel, bonderized finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for durable, corrosion resistant surface protection.
2. Fan:
- a) The unit shall be furnished with a direct drive, high performance propeller type fan.
 - b) Fan speed shall be switch automatically according to the number of operating indoor units and the compressor operating frequency.
 - c) The fan motor shall be mounted with vibration isolation for quiet operation.

- d) The fan shall be provided with a raised guard to prevent contact with moving parts.
 - e) The outdoor unit shall have horizontal discharge airflow.
3. Coil:
- a) The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
 - b) The coil shall be protected with an integral guard.
 - c) Refrigerant flow from the outdoor unit shall be independently controlled by means of individual electronic linear expansion valves for each indoor unit.
- Compressor:
- a) The compressor shall be a high performance, hermetic, inverter driven, variable speed, rotary type.
 - b) The outdoor unit shall be equipped with a suction side refrigerant accumulator.
 - c) The compressor will be equipped with an internal thermal overload.
 - d) The compressor shall be mounted to avoid the transmission of vibration.
- E. Piping Requirements:
The outdoor unit must have the ability to operate within the following refrigerant piping and height limitations without the need for line size changes, traps or additional oil.
- F. Electrical:
- 1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
 - 2. The outdoor unit shall be controlled by the microprocessors located in the indoor unit and in the outdoor unit communicating system status, operation, and instructions digitally over Control wiring.

2.13 GAS FIRED DUCT FURNACES (POWERED VENTED)

- A. Acceptable Manufacturers:
- 1. Hastings
 - 2. Modine
 - 3. Reznor
- B. Provide a gas fired duct furnace having the capacities as scheduled on the drawings.
- C. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, heat exchanger, burner, controls, and accessories.
- D. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors, glass fiber insulation and reflective liner.
- E. Heat Exchanger: [Aluminized steel] [Type E-3 stainless steel] [Type 321 stainless steel] welded construction.
- F. Gas Burner:

1. Atmospheric type with adjustable combustion air supply,
2. Gas valve[, two stage] [, modulating] provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
3. Electronic pilot ignition, with [electric spark] [hot surface] igniter.
4. [Combustion air damper] [Automatic vent damper] with synchronous spring return damper motor.
5. Non-corrosive combustion air blower with permanently lubricated motor.

G. Gas Burner Safety Controls:

1. Thermocouple sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
2. Flame rollout switch: Installed on burner box and prevents operation.
3. Vent safety shutoff sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.

2.16 UNIT HEATERS

A. HOT WATER

1. Acceptable manufacturers
 - a. Airtherm
 - b. Modine
 - c. Sterling
 - d. Vulcan
2. Provide a hot water unit heater having the capacities as scheduled on the drawings.
3. Coils: Seamless copper tubing, silver brazed to steel headers, and with evenly spaced aluminum fins mechanically bonded to tubing.
4. Casing: 18 gauge steel with threaded pipe connections for hanger rods.
5. Finish: Factory applied baked enamel.
6. Fan: Direct drive propeller type, statically and dynamically balanced, with fan guard.
7. Air Outlet: Two way louvers on horizontal throw models.
8. Motor: Permanently lubricated sleeve bearings.

2.17 CABINET UNIT HEATERS

A. Acceptable manufacturers

1. Airtherm
2. Rittling

3. Sterling
 4. Vulcan
- B. Provide a cabinet unit heater having the capacities as scheduled on the drawings.
 - C. Coils: Evenly spaced aluminum fins mechanically bonded to copper tubes, designed for 100 psi and 220 degrees F.
 - D. Cabinet: 16 gauge steel with exposed corner and edges rounded, easily removed panels, glass fiber insulation [and integral air outlet] [and integral air outlet and inlet grilles].
 - E. Finish: Factory applied baked enamel, color as selected by architect.
 - F. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.
 - G. Motor: Tap wound multiple speed permanent split capacitor with sleeve bearings, resiliently mounted.
 - H. Control: Multiple speed switch, factory wired, located in cabinet.
 - I. Filter: Easily removed 1 inch permanent washable type, located to filter air before coil.

2.18 FINTUBE RADIATION

- A. HOT WATER
 1. Acceptable manufacturers
 - a. Rittling
 - b. Sterling
 - c. Vulcan
 2. Provide fintube radiation having the capacities as scheduled on the drawings.
 3. Heating Elements: 3/4 inch seamless copper tubing, mechanically expanded into evenly spaced aluminum fins sized 4 x 4 inches suitable for soldered fittings.
 4. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
 5. Enclosures: 16 gage steel with easily jointed components for wall to wall installation. Support rigidly, on wall or floor mounted brackets, 3 feet on center maximum.
 6. Finish: Factory applied baked enamel color as selected by architect.

7. Damper: Where not thermostatically controlled, provide knob-operated internal damper at enclosure air outlet.
8. Access Doors: For otherwise inaccessible valves, provide factory-made permanently hinged access doors, 6 x 7 inch minimum size, integral with cabinet.

PART 3 EXECUTION

3.1 GENERAL EQUIPMENT PREPARATION AND INSTALLATION

- A. Verify that electric power is available and of the correct characteristics.
- B. Install equipment and accessories in accordance with manufacturer's instructions.
- E. Provide operating controls as required. Refer to Section 15910.

3.2 PUMP INSTALLATION

- A. Provide access space around pumps for service. Provide no less than minimum as recommended by manufacturer.
- B. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. For close coupled or base mounted pumps, provide supports under elbows on pump suction and discharge line sizes 4 inches and over. Refer to Section 15060.
- C. Provide air cock and drain connection on horizontal pump casings.
- D. Provide drains for bases and seals, piped to and discharging into floor drains with 2" air gap.
- E. Check, align, and certify alignment of base mounted pumps prior to start-up.
- F. Install base mounted pumps on concrete housekeeping base, with anchor bolts, set and level, and grout in place. Refer to Section 03300.
- G. Lubricate pumps before start-up where applicable.

3.3 BOILER INSTALLATION

- A. Install in accordance with NFPA 54 and NFPA 58.
- B. Install boiler on concrete housekeeping base, sized minimum 4 inches larger than boiler base. Refer to Section 03300.
- C. Provide connection of natural gas service in accordance with NFPA 54 and NFPA 58.
- D. Provide piping connections and accessories as indicated; refer to Section 15710.

SECTION 15720-HEAT TRANSFER-14
FMS 3 Warwick Armory- HVAC Upgrade

- E. Pipe relief valves to nearest floor drain.
- F. The boiler manufacturer shall boil-out each boiler in accordance with ABMA standards and in accordance with the boiler manufacturer's recommendations. The boiler manufacturer shall furnish all labor, material, and chemicals to perform this boil-out. If the waterside condition is not acceptable to the engineer, then the boil-out procedure must be repeated until acceptable.

3.8 WATER TREATMENT INSTALLATION

- A. Systems shall be operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.
- B. Place terminal control valves in open position during cleaning.
- C. Closed System (Heating and Chilled Water)
 - 1. Provide one bypass feeder on each system. Install isolating and drain valves and necessary piping. Install around balancing valve downstream of circulating pumps unless indicated otherwise.
 - 2. Introduce closed system treatment through bypass feeder when required or indicated by test.
 - 3. Provide 3/4 inch water coupon rack around circulating pumps with space for 4 test specimens.

G. CLEANING SEQUENCE

- 1. Concentration:
 - a. As recommended by manufacturer.
 - b. One pound per 100 gallons of water contained in the system.
 - c. One pound per 100 gallons of water for hot systems and one pound per 50 gallons of water for cold systems.
 - d. Fill steam boilers only with cleaner and water.
- 2. Hot Water Heating Systems:
 - a. Apply heat while circulating, slowly raising temperature to 160 degrees F and maintain for 12 hours minimum.
 - b. Remove heat and circulate to 100 degrees F or less; drain systems as quickly as possible and refill with clean water.
 - c. Circulate for 6 hours at design temperatures, then drain.

- d. Refill with clean water and repeat until system cleaner is removed.

3.9 AIR HANDLING UNIT INSTALLATION

- A. Install in accordance with ARI 435.
- B. Bolt section together with gaskets. Isolate fan section with flexible duct connections.
- C. Install flexible connections between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- D. Install assembled unit on vibration isolators. Install isolated fans with resilient mountings and flexible electrical leads. Install restraining snubbers as required. Refer to Section 15060. Adjust snubbers to prevent tension in flexible connectors when fan is operating.
- E. Provide sheaves required for final air balance.

3.12 AIR COOLED CONDENSING UNIT AND CONDENSER UNIT INSTALLATION

- A. Install units on roof curb as indicated. .
- B. Provide connection to refrigeration piping system and evaporators. Refer to Section 15710. Comply with ASHRAE 15.
- C. Furnish charge of refrigerant and oil.
- D. Supply initial charge of refrigerant and oil for each refrigeration system. Replace losses of oil or refrigerant prior to end of correction period.
- E. Charge system with refrigerant and test entire system for leaks after completion of installation. Repair leaks, put system into operation, and test equipment performance.
- F. Shut-down system if initial start-up and testing takes place in winter and machines are to remain inoperative. Repeat start-up and testing operation at beginning of first cooling season.

END OF SECTION

1.6 SUBMITTALS

- A. Section 01300 – Submittals: Procedures for submittals.
- B. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of flues indicating plan view and elevations. Submit layout drawings indicating plan view and elevations for sheet metal work at 1/4"= 1'-0" scale indicating duct sizes, elevations, fittings, dampers, access doors, etc. Submit assemblies for dampers, access doors, fans and accessories.
- C. Product Data: Provide data indicating dimensional details of components, flues, flue caps, electrical characteristics, connection requirements, fan curves, horsepower, CFM, RPM, filter frames and sizes, grille and diffuser data, schedule of grilles and diffusers indicating inlet/outlet type, size, location, variable air volume box schedule indicating air flow, static pressure, CFM, etc.
- D. Submit manufacturer's installation instructions: Indicate assembly, support details, connection and maintenance requirements.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- C. Perform sheet metal work in accordance with SMACNA – HVAC duct construction standards – metal and flexible.
- D. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.
- E. Test and rate louver performance in accordance with AMCA 500.

1.8 REGULATORY REQUIREMENTS

- A. Conform to applicable code, NFPA 54 (ANSI Z223.1) code for installation of natural gas burning appliances and equipment.
- B. Products Requiring Electrical Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.9 DELIVERY, STORAGE AND PROTECTION

- A. Section 01600 – Material and Equipment: Transport, handle, store and protect products.
- B. Protect motors, shafts and bearing from weather and construction dust.
- C. Protect dampers from damage to operating linkages and blades.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Section 01600 – Material and Equipment: Environmental conditions affecting products on site.

- B. Do not operate fans for any purpose until ductwork is clean, filters in place, bearings lubricated and fan has been test run under observation.
- C. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- D. Maintain temperatures during and after installation of duct sealants.

1.11 EXTRA MATERIALS

- A. Section 01700 – Contract Closeout, 01730 – Operation and Maintenance Data.
- B. Supply one additional set of belts for each fan.
- C. Provide one additional set of disposable panel filters.
- D. Provide two additional of each size and type of fusible links.

PART 2-PRODUCTS

2.1 METAL CHIMNEYS AND FLUES

- A. Boilers:
- B. Furnish and install Category IV Flue vent, as shown on the drawings, Flue shall be single-wall AL 29-4C stainless steel flue system. Provide drain with trap, piped to floor drain for each boiler, water heater and flue system.
- C. The flue shall be installed in accordance with the manufacturer’s installation and maintenance instructions and with all applicable local, regional, and national codes.
- D. Joints shall be gas tight, preventing leakage of products of combustion into a building.
- E. The venting system shall be sized in accordance with the appliance manufacturers’ specifications, the most current edition of NFPA 54, and ASHRAE recommendations.
- F. System shall be complete with elbows, tees, laterals, tapered increasers/reducers, barometric damper, bottom drain tee, thimbles, support plates, expansion sections, flange adapters, boiler kits, and all necessary hangers, guying and supports. Final system design/layout shall be by breeching manufacturer. Submit shop drawings for each system.
- G. Manufacturer shall be Heat-Fab, Selkirk Metalbestos, or approved equal.

2.2 FANS

A. INLINE FANS

1. Acceptable Manufacturers:
 - a. Greenheck
 - b. Loren Cook
 - c. Penn Ventilator
2. Provide an inline fan having the capacities as scheduled on the drawings.
3. Performance Ratings: Conform to AMCA 210 and bear the AMCA Certified Rating Seal.
4. Sound Ratings: AMCA 301, tested to AMCA 300 ,and bear AMCA Certified Sound Rating Seal.

5. Fabrication: Conform to AMCA 99.
6. Performance Base: Sea level conditions.
7. Temperature Limit: Maximum 300 degrees F.
8. Static and Dynamic Balance: Eliminate vibration or noise transmission to occupied areas.
9. Backward Inclined: Steel or aluminum construction with smooth curved inlet flange, heavy back plate, backwardly curved blades welded or riveted to flange and back plate; cast iron or cast steel hub riveted to back plate and keyed to shaft with set screws.
10. Heavy gage steel housing, spot welded for AMCA 99 Class I and II fans, and continuously welded for Class III, adequately braced, designed to minimize turbulence with spun inlet bell and shaped cut-off.
11. Provide bolted construction with horizontal flanged split housing .
12. Bearings: Heavy duty pillow block type, self-aligning, grease-lubricated ball bearings, with ABMA 9 L-50 life at 200,000 hours.
13. Shafts: Hot rolled steel, ground and polished, with keyway, protectively coated with lubricating oil, and shaft guard.
14. V-Belt Drive: Cast iron or steel sheaves, dynamically balanced, keyed. Variable and adjustable pitch sheaves for motors 15 hp and under, selected so required rpm is obtained with sheaves set at mid-position. Fixed sheave for 20 hp and over, matched belts, and drive rated as recommended by manufacturer or minimum 1.5 times nameplate rating of the motor.
15. Belt Guard: Fabricate to SMACNA Standard; Galvanized Steel welded to steel angle frame or equivalent. Secure to fan or fan supports without short circuiting vibration isolation, with provision for adjustment of belt tension, lubrication, and use of tachometer with guard in place.
16. Wheel Cone: Constructed to match inlet cone.
18. Access Panels: Two removable panels located perpendicular to the motor mounting panel.

2.4 DUCTWORK (Supply, Return, Outside and Combustion air)

- A. Galvanized Steel Ducts: ASTM A525 and ASTM A527 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.

2.5 AIR TURNING DEVICES/EXTRACTORS

- A. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

2.6 DAMPERS.

A. BACKDRAFT DAMPERS

1. Acceptable Manufacturers:
 - a. Ruskin Model BD2A1
 - b. Nailor
 - c. Safe-Air
2. Multi-Blade, Parallel Action Gravity Balanced Backdraft Dampers: 16 gage thick galvanized steel, or extruded aluminum, with center pivoted blades of

maximum 6 inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

B. MANUAL BALANCING DAMPERS.

1. Acceptable Manufacturers:

- a. Ruskin Model MD35 (square or rectangular)
- b. Ruskin Model MDRS25 (round)
- c. Nailor Industries
- d. Safe-Air

2. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

C. CONTROL DAMPERS.

1. Acceptable Manufacturers:

- a. Ruskin Model CD50
- b. Nailor Industries
- c. Safe-Air

2. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

3. Multiple Blade Dampers:

- a. Material: Same gage as duct to 24 inches size in either direction and two gages heavier for sizes over 24 inches.
- b. Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
- c. Operator: Minimum 1/2 inch diameter rod in self aligning, universal joint action, flanged bushing with set screw.
- d. Fabricate of opposed blade pattern with maximum blade sizes 8 x 72 inch. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
- e. End Bearings: Provide oil-impregnated nylon or sintered bronze bearings.

4. Coordinate with Specification Section 15900.

2.7 DUCT TEST HOLES

A. Temporary Test Holes: cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent Test Holes: Factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.8 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
- B. Connector: Fabric crimped into metal edging strip.
 - 1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd.
 - 2. Net Fabric Width: Approximately 6 inches wide.
 - 3. Metal: 3 inch wide, 24 gage thick galvanized steel.
- C. Leaded Vinyl Sheet: Minimum 0.55 inch thick, 0.87 lbs per sq ft, 10 dB attenuation in 10 to 10,000 Hz range.

2.15 DIFFUSERS, REGISTERS AND GRILLES

- A. Acceptable Manufacturers:
 - a. Anemostat
 - b. Krueger
 - c. Titus
 - d. Tuttle and Bailey
- B. Provide diffusers, registers and grilles of the style and type as scheduled on the drawings.
- C. Provide diffusers, registers and grilles complete with all accessories as indicated on the drawings.
- D. Equipment shall be manufactured of steel or aluminum with a factory finish.
- E. Provide all related mounting frames and miscellaneous hardware as required.

PART 3 EXECUTION

3.1 FLUE INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 54 (ANSI Z223.1)
- C. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.
- E. Install concrete inserts for support of breechings, chimneys, and stacks in coordination with formwork.
- F. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.
- G. Coordinate installation of dampers, and induced draft fans. Refer to Division 16.
- H. Assemble and install stack sections in accordance with industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement to ASTM C105. Connect base section to foundation using anchor lugs.
- K. Level and plumb chimney and stacks.
- L. Clean breechings, chimneys, and stacks during installation, removing dust and debris.
- M. At appliances, provide slip joints permitting removal of appliances without removal or dismantling of breechings, breeching insulation, chimneys, or stacks.

- N. Provide maximum 2 feet of breeching to connect appliance to chimney. Provide Type B chimney continuously from appliances.

3.2 FAN INSTALLATION

- A. Section 01400-Quality Control: Manufacturer's instructions.
- B. Install fans with resilient mountings and flexible electrical leads. Refer to Section 15060.
- C. Install flexible connections between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- D. Install fan restraining snubbers. Adjust snubbers to prevent tension in flexible connectors when fan is operating.
- E. Provide sheaves required for final air balance.
- F. Do not operate fans in normal operation until ductwork is clean, filters are in place, bearings are lubricated, and fan has been test run under observation.
- G. Secure roof exhausters with aluminum lag screws to roof curb.
- H. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.
- I. Hung Cabinet Fans:
 - 1. Install fans with resilient mountings and flexible electrical leads.
 - 2. Install flexible connections between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- J. Install backdraft dampers on inlet to roof exhausters.

3.3 DUCTWORK AND ACCESSORY INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible. Provide duct material, gages, reinforcing and sealing for operating pressures indicated.
- D. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide air foil turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- F. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Joints shall be minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.
- G. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.
- X. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.

END OF SECTION

SECTION 15910

CONTROLS AND INSTRUMENTS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

- A. Provide electronic control systems consisting of thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems, and to perform functions specified.
- B. Base system on distributed system of fully intelligent, stand-alone controllers, with central and remote hardware, software, and interconnecting wire and conduit.
- C. Include installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.
- D. Offsite remote monitoring and control of boiler and ductless A/C unit

1.2 Manufacturers:

1. KMC Controls

Automatic Temperature Control (ATC) is only known contractor capable of providing the desired design and control functions and desired by the owner at Rhode Island National Army guard facilities.

1.3 RELATED SECTIONS

- A. Section 15010 – Basic Mechanical Requirements.
- B. Section 15020 – Basic Materials and Methods.
- G. Division 16

1.4 REFERENCES

- A. ASME MC85.1 - Terminology for Automatic Control.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- C. NEMA EMC1 - Energy Management Systems Definitions.
- D. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.
- E. NFPA 70 - National Electrical Code.
- F. ASHRAE Standard 135-1995-BACnet.

1.5 SUBMITTALS

- A. Refer to Section 15010.
- B. Submit complete temperature control shop drawings, sequence of control and specification data for approval prior to installation or fabrication of any equipment. Submittal data shall include a schedule of all devices to be installed, selected for

optimum system operation; including location, schedules, properly sized control valves and dampers.

- C. Deviations in details from the specified sequence of control shall be clearly noted on the sequence of control portion of the submittal.

1.6 SUBMITTALS AT PROJECT CLOSEOUT

- A. Refer to Section 01700 - Contract Closeout.
- B. Project Record Documents: Record actual locations of control components, including panels, thermostats, and sensors. Revise shop drawings to reflect actual installation and operating sequences.
- C. Operation and Maintenance Data: Include systems descriptions, set points, and controls settings and adjustments. Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience.

1.8 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.
- B. Wire conduit and miscellaneous wiring devices shall be provided and installed as specified in Section 16010 "Electrical General Provisions" and Section 16050 "Basic Materials and Methods" of this specification.

1.9 COORDINATION

- A. Work furnished and wired by temperature control contractor, but installed by the HVAC Contractor.
 - 1. Control Dampers
 - 2. Control Valves
 - 3. Duct Sensors: This contractor shall ensure that mechanical contractor furnishes and installs a hinged insulated access door for each duct mounted control.
 - 5. All wells and openings for sensors in ducts and pipes.
 - 6. Refer to Section 15010 for coordination between temperature and balancing contractors.

1.10 WARRANTY

- A. After completion control manufacturer shall adjust all new thermostats, control valves, motors and other equipment provided under this Contract with trained personnel in his direct employ. Place controls in operating condition subject to the approval of the Engineer. Instruct operating personnel in the operation and maintenance of the control system.
- B. The control system specified herein shall be guaranteed free from defects in workmanship and material under normal use and service for a period of one year after acceptance.
- C. Any equipment herein described proven to be defective in workmanship or material during the guarantee period shall be adjusted, repaired or replaced at no charge to the Owner.
- D. Provide five year manufacturer's warranty for field programmable micro-processor based units.

PART 2 PRODUCTS

2.1 CONTROL WIRING

- A. All wiring incidental to this temperature control system shall be provided by the Control Contractor.
- B. The term "Wiring" shall be construed to include furnishing of wire, conduit, miscellaneous materials and labor as required for mounting and connecting electrical control devices, and providing electrical interlocks between equipment.
- C. Wire, conduit and miscellaneous wiring devices shall be provided and installed as specified in Section 16010 "Electrical General Provisions" and Section 16050 "Basic Materials and Methods" of this specification.
- D. All wiring shall be properly supported and run in a neat and workmanlike manner. All wiring exposed and in equipment rooms shall run parallel to or at right angles to the building structure. All wiring within enclosures shall be neatly bundled and anchored to prevent obstruction to devices and terminals. All wiring shall be in accordance with all local and national codes. All line voltage wiring, all wiring exposed, and all wiring in equipment rooms shall be installed in conduit in accordance to the electrical specifications. All electronic wiring shall be #18 gauge twisted, #22 or #24 gauge is acceptable if used as a part of an engineered structured cabling system. The control manufacturer must submit technical and application documentation demonstrating that this cabling system has been tested and approved for use by the manufacturer of both the control system and the engineered structured cabling system. All wiring in the central control room shall be concealed in an approved manner.

2.3 DAMPERS, VALVES, AND ACTUATORS

A. Control Valves

1. Globe Pattern:

- a. Up to 2 inches: Bronze body, bronze trim, rising stem, renewable composition disc, screwed ends with backseating capacity repackable under pressure.
 - b. Hydronic Systems:
 - 1. Rate for service pressure of 125 psig at 250 degrees F.
 - 2. Replaceable plugs and seats of brass.
 - 3. Two way valves shall have equal percentage characteristics, three way valves linear characteristics. Size two way valve operators to close valves against pump shut off head.
 - 4. Electronic Operators:
 - a. Valves shall spring return to normal position as indicated on freeze, fire or temperature protection.
 - b. Select operator for full shut off at maximum pump differential pressure.
 - 5. Radiation Valves:
 - a. Bronze body, bronze trim, 2 or 3 port as indicated, replaceable plugs and seats, union and threaded ends.
 - b. Rate for service pressure of 125 psig at 250 degrees F.
 - c. Size for 3 psig maximum pressure drop at design flow rate.
 - d. Two way valves shall have equal percentage characteristics, three way valves linear characteristics. Size two way valve operators to close valves against pump shut off head.
 - e. Operators (2 Position): Synchronous motor with enclosed gear train, dual return springs, valve position indicator; 24 v DC, 0.4 amp. Valves shall spring return to normal position for temperature protection.
- B. CONTROL DAMPER**
- 1. Damper
 - a. Performance: Test in accordance with AMCA 500.
 - b. Frames: Galvanized steel, welded or riveted with corner reinforcement, minimum 12 gage.
 - c. Blades: Galvanized steel, maximum blade size 8 inches [6 inches] wide, 48 inches long, minimum 22 gage, attached to minimum 1/2 inch shafts with set screws.
 - d. Blade Seals: Synthetic elastomeric or Neoprene mechanically attached, field replaceable.
 - e. Jamb Seals: Spring stainless steel.
 - f. Shaft Bearings: Lubricant free, stainless steel, single row, ground, flanged, radial, antifriction type with extended inner race.

- g. Linkage Bearings: Oil impregnated sintered bronze or Graphite impregnated nylon.
- h. Leakage: Less than ½ percent based on approach velocity of 2000 ft/min and 4 inches wg.
- i. Maximum Pressure differential: 6 inches W.C.
- j. Temperature Limits: -40 to 200 degrees F.

2. Damper Operators

- a. General: Provide smooth proportional control with sufficient power for air velocities 20 percent greater than maximum design velocity and to provide tight seal against maximum system pressures. Provide spring return for two position control and for fail safe operation.
- b. Electric Operators: Spring return, adjustable stroke motor having oil immersed gear train, with auxiliary switch.
- c. Provide sufficient number of actuators to achieve unrestricted movement throughout damper range.

2.5 INPUT/OUTPUT SENSORS

A. Temperature

- 1. Resistance temperature detectors with resistance tolerance of plus or minus 0.1 percent at 70 degrees F, interchangeability less than plus or minus 0.2 percent, time constant of 13 seconds maximum for fluids and 200 seconds maximum for air.
- 2. Measuring current maximum 5 mA with maximum self-heat of 0.031 degrees F/mW in air.
- 3. Provide 3 lead wires and shield for input bridge circuit.
- 4. Use insertion elements in ducts not affected by temperature stratification or smaller than one square meter. Use averaging elements where larger or prone to stratification sensor length 8 feet or 16 feet as required.
- 5. Insertion elements for liquids shall be with brass socket with minimum insertion length of 2-1/2 inches.
- 6. Room sensors: Locking cover.
- 7. Outside air sensors: Watertight inlet fitting, shielded from direct rays of sun.
- 8. Room security sensors: Stainless steel cover plate with insulated back and security screws.

2.6 THERMOSTATS

- A. Electronic Room Thermostats: Low voltage with electronic controller, wall mounted with integral sensor with setback/setup temperature control for cooling and heating.
- B. Room Thermostat Accessories:

1. Thermostat Covers: Metal
 2. Insulating Bases: For thermostats located on exterior walls.
 3. Thermostat Guards (Secure Areas): [Metal security type, Shaw Perkins Series 16 or approved equal.] [Locking transparent plastic].
 4. Adjusting Key: As required for device.
- C. Outdoor Reset Thermostat: Remote bulb or bi-metal rod and tube type, for proportioning action with adjustable throttling range; scale range of 10 to 70° F with adjustable setpoint.
- D. Low Temperature Protection Thermostats
1. Two-position, line voltage, averaging bulb type, of ample length to fully protect the area of surface being served.
 2. Capable of shutting down the circuit if any 1' section of the built is subject to a temperature below the setting as specified an/or indicated.
 3. Where specified and/or indicated it shall have 2 circuits, one to shut down the supply system, and the other to energize the alarm circuit.
 4. Low limit thermostat shall be manual reset type.

2.8 AIR QUALITY SENSOR

- A. Carbon Monoxide (CO) Space Sensor with Control Panel
1. Manufacturers
 - a. Toxalert, Inc. Model GVU-2/ANA
 - b. Other acceptable manufacturers
 1. National Draeger
 2. Sierra Monitor Corp.
 2. Provide remote CO sensor as located on the drawings. The remote CO sensor shall utilize a solid state sensing element, be micro processor based and be both temperature and humidity compensated for long life and stability. Pilot lights or LEDs shall indicate:
 - a. Unit normal operation/NOT in alarm
 - b. High CO/unit in alarm
 - c. Shall indicate unit malfunction
 3. In the unit malfunction conditions, the CO sensors output shall be fail-safe and indicate steady high CO condition.
 4. The CO sensor range shall be 0 to 400 ppm and shall be calibrated with a CO test gas and be calibrated to initiate exhaust fan operation at 100 ppm of CO concentration.

5. The system controller shall continuously monitor its remote sensors. When an alarm condition is detected the controller shall activate ventilation system as described in sequence of operation of this section.
6. The controller shall be designed such that in the event of a power failure the control unit shall set itself to an alarm condition and upon restoration shall automatically activate the fan output to clean any possible accumulated toxic gases.
7. The controller shall include separate red LEDs for each remote sensor to indicate which sensor is indicating a high CO condition. A separate LED shall prove, when lighted, that the remote CO sensors have power.
 - a. Power “ON” light emitting diode (LED) on face of controller to indicate power to system.
 - b. LED on face of panel to indicate high CO alarm condition. One for each sensor.
 - c. Fan ON (LED) indication.
 - d. Local alarm horn and/or light. Horn has silence switch.
 - e. Sensor power indication on face of panel
 - f. Calibration kit for CO
 - g. Keyed panel lock

END OF SECTION

SECTION 16000

ELECTRICAL WORK

TABLE OF CONTENTS

PART 1 - GENERAL

1.01	GENERAL PROVISIONS.....	3
1.02	DESCRIPTION OF WORK	3
1.03	SUBMITTALS.....	4
1.04	REFERENCES	4
1.05	REGULATORY REQUIREMENTS	4
1.06	SURVEYS AND MEASUREMENTS	5
1.07	COORDINATION	5
1.08	MECHANICAL AND ELECTRICAL COORDINATION	5
1.09	INSTALLATION REQUIREMENTS	6
1.10	TYPICAL DETAILS	6
1.11	SLEEVES, INSERTS	6
1.12	CORING, DRILLING.....	6
1.13	ACCESSIBILITY	6
1.14	SUPPLEMENTARY SUPPORTING STEEL	7
1.15	TOOLS AND EQUIPMENT	7
1.16	PORTABLE AND DETACHABLE PARTS	7
1.17	RECORD DRAWINGS, PROJECT CLOSEOUT	7
1.18	GUARANTEE/WARRANTY	7
1.19	OPERATING, INSTRUCTION AND MAINTENANCE MANUALS	8
1.20	SERVICE CHARACTERISTICS.....	9
1.21	QUALITY ASSURANCE	9
1.22	DELIVERY, STORAGE AND HANDLING.....	10
1.23	PHASING, DEMOLITION AND MAINTAINING EXISTING SERVICES	10

PART 2 - PRODUCTS

2.01	MANUFACTURERS	11
2.02	RACEWAYS AND FITTINGS	11
2.03	WIRING MATERIALS - 600V OR LESS SYSTEMS	12
2.04	OUTLET, JUNCTION, PULL BOXES, AND WIRING TROUGHS FOR ALL SYSTEMS	13
2.05	GROUNDING REQUIREMENTS.....	14
2.06	PHASING AND COLOR CODING.....	14
2.07	ENCLOSURES FOR INDIVIDUALLY MOUNTED OVERCURRENT AND SWITCHING DEVICES	15
2.08	MOLDED CASE CIRCUIT BREAKERS	15
2.09	CARTRIDGE FUSES	16
2.10	MOTOR CONTROLS	16
2.11	EQUIPMENT GROUNDING REQUIREMENTS	17

PART 3 - EXECUTION

3.01	BASIC REQUIREMENTS	18
3.02	TESTING REQUIREMENTS & INSTRUCTIONS.....	19

3.03	BRANCH CIRCUITRY.....	23
3.04	REQUIREMENTS GOVERNING ELECTRICAL WORK IN DAMP OR WET LOCATION ...	23
3.05	IDENTIFICATION AND TAGGING	24
3.06	LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATION	25
3.07	SUPPORTS AND FASTENINGS	25
3.08	SPLICING AND TERMINATING WIRES AND CABLES	26
3.09	PULLING WIRES INTO CONDUITS AND RACEWAYS	27
3.10	REQUIREMENTS FOR THE INSTALLATION OF JUNCTION BOXES, OUTLET BOXES AND PULL BOXES	28
3.11	LOCATING AND ROUTING OF CIRCUITRY	29
3.12	INSTALLING CIRCUITRY.....	30

END OF TABLE OF CONTENTS

SECTION 16000

ELECTRICAL WORK

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.
- B. Reference Drawings: E1 & E2

1.02 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. Providing power to feed new HVAC equipment, including new circuit breakers in existing electrical panels, safety disconnect switches, raceways, cables, wiring, junction and pull boxes, wireways, and all other components required for complete electrical distribution system.
 - 2. Removing existing wiring, raceways, cables junction and pull boxes, and all other components of existing HVAC equipment being removed.
 - 3. Grounding and bonding of all electrical systems and equipment.
 - 4. Wiring devices (receptacles) complete with associated wallplates.
 - 5. Testing of all electrical systems.
 - 6. Coordination between electrical and other trades.
 - 7. Core drilling for the Work of this Section.
 - 8. Coordination drawings and record drawings and similar requirements.
 - 9. Staging, Planking and Scaffolding: The Electrical Work subcontractor shall furnish, install and maintain in safe and adequate condition, all staging, planking and scaffolding up to eight feet in height that is necessary for the proper execution of the Work in this Section. The General Contractor shall furnish, install and maintain in safe and adequate condition all staging, planking and scaffolding above eight feet in height.
- B. Items To Be Installed Only: Install the following items as furnished by the designated Sections:
 - 1. Section 230001 - HEATING, VENTILATING AND AIR CONDITIONING:
 - a. Power connections for DDC control panels, heat pumps and fans coil unit.
- C. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 230001 – HEATING, VENTILATING AND AIR CONDITIONING for coordination with HVAC piping and ductwork, motors.
- D. The Electrical Sub-Contractor shall be responsible for filing all documents, payment of all fees, and securing of all inspections and approvals necessary for the electrical work.

1.03 SUBMITTALS

- A. Comply with requirements specified in Section 013300 – SUBMITTAL PROCEDURES.
- B. Material and equipment requiring Shop Drawing Submittals shall include but not be limited to:
 - 1. Overcurrent and switching devices.
 - 2. Motor control equipment.
 - 3. Wiring devices and wall plates.
 - 4. Wiring and cables.
 - 5. Conduits.
 - 6. Boxes and fittings.
 - 7. Safety switches.

1.04 REFERENCES

- A. 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.
- B. 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.

1.05 REGULATORY REQUIREMENTS

- A. Comply with all applicable federal and state laws, and all local codes, by-laws and ordinances.
- B. Where provisions of the Contract Documents conflict with any codes, rules or regulations, the latter shall govern. Where the contract requirements are in excess of applicable codes, rules or regulations, the contract provisions shall govern unless the Designer rules otherwise.
- C. Request inspections from authorities having jurisdiction, obtain all permits and pay for all fees and inspection certificates as applicable and/or required. All permits and certificates shall be turned over to the Owner's Project Manager s at the completion of the work. Copies of permits shall be given to the resident engineer prior to the start of work.
- D. Unless otherwise specified or indicated, materials and workmanship and equipment performance shall conform with the latest edition of the following standards, codes, specifications, requirements and regulations:
 - 1. State Building Code
 - 2. State Electrical Code
 - 3. National Fire Protection Association (NFPA)
 - 4. Local Town Regulations and By-laws
 - 5. Underwriter's Laboratories, Inc. (UL)
 - 6. National Electrical Manufacturer's Association (NEMA)
 - 7. American National Standards Institute (ANSI)

- E. All electrical work shall meet or exceed any other state and local codes and/or authorities having jurisdiction including all other standards indicated herein.

1.06 SURVEYS AND MEASUREMENTS

- A. Base all required measurements, both horizontal and vertical, on reference points established by the General Contractor and be responsible for the correct laying out of the electrical work. In the event of a discrepancy between actual measurements and those indicated, notify the General Contractor in writing, and do not proceed with the work required until written instructions have been issued by the General Contractor.

1.07 COORDINATION

- A. HVAC and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structure and other trades and to meet Architectural requirements.
- B. Work shall be performed in cooperation with other trades on the project and so scheduled as to allow speedy and efficient completion of the work.
- C. Furnish to other trades advance information on locations and sizes of all frames, boxes, sleeves and openings needed for their work, and also furnish information and shop drawings necessary to permit trades affected by the work to install same properly and without delay.
- D. In all spaces, prior to installation of visible material and equipment, review Mechanical Drawings for exact locations and where not definitely indicated, request information from Designer. Where the electrical work shall interfere with the work of other trades, assist in working out the space conditions to make satisfactory adjustments before installation. Without extra cost to the Owner, make reasonable modifications to the work as required by normal structural interferences. Maintain maximum headroom at all locations. All piping, duct, conduit, and associated components to be as tight to underside of structure as possible.
- E. If any electrical work has been installed before coordination with other trades so as to cause interference with the work of such trades, all necessary adjustments and corrections shall be made by the electrical trades involved without extra cost to the Owner.
- F. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Designer for review and approval.
- G. Protect all materials and work of other trades from damage, which may be caused by the electrical work, and repair all damages without extra cost to the Owner.

1.08 MECHANICAL AND ELECTRICAL COORDINATION

- A. Heating and Ventilating Subcontractor shall furnish and install various electrical items relating to the heating and ventilating equipment and control apparatus. The Electrical Subcontractor shall be required to connect power wiring to this equipment unless noted otherwise.

- B. All power wiring and local disconnect switches will be provided by the Electrical Subcontractor for the line voltage power. All control and interlocking wiring shall be the responsibility of the Mechanical Subcontractor.
- C. 120V and above power wiring sources extended and connected to mechanical control panels, transformers and switches shall be the responsibility of the Electrical Subcontractor. All low voltage thermostats, zone valve and any switch wiring shall be the responsibility of the Heating and Ventilating Subcontractor.

1.09 INSTALLATION REQUIREMENTS

- A. The arrangement of all electrical work shown on the drawings is diagrammatic only and indicates the minimum requirements of the work. Conditions at the building including actual measurements shall determine the details of the installation. All work shall be laid out and installed so as to require the least amount of cutting and patching.
- B. Check the Architectural plans and specifications before ordering any material and equipment. Any discrepancies shall be brought to the attention of the Designer for his determination prior to proceeding with the work.

1.10 TYPICAL DETAILS

- A. Typical details where shown on the drawings shall apply to each and every item of the project where such items are applicable. They are not repeated in full on the drawings, which in many cases are diagrammatic only, but with the intention that such details shall be incorporated in full. Any alternate method proposed for use by the Contractor shall have the prior approval of the Designer.

1.11 SLEEVES, INSERTS

- A. Furnish and install all sleeves, inserts, anchor bolts and similar items to be set into masonry or concrete, as required for mechanical and electrical work. Internal diameter of sleeve shall be 2" larger than the outside diameter of the pipe or insulation covered line passing through it.

1.12 CORING, DRILLING

- A. Core, cut and/or drill all small holes 4.5" diameter or less in walls and floors required for the installation of sleeves and supports for the electrical work.

1.13 ACCESSIBILITY

- A. Install all work such that parts requiring periodic inspection, operation, maintenance and repair are readily accessible.
- B. Furnish all access panels appropriate to particular conditions, to be installed by trades having responsibility for the construction of actual walls, floors or ceilings at required locations.

1.14 SUPPLEMENTARY SUPPORTING STEEL

- A. Provide all supplementary steelwork required for mounting or supporting equipment and materials.
- B. Steelwork shall be firmly connected to building construction as required.
- C. Steelwork shall be of sufficient strength to allow only minimum deflection in conformity with manufacturer's published requirements.
- D. All supplementary steelwork shall be installed in a neat and workmanlike manner parallel to floor, wall and ceiling construction; all turns shall be made at forty-five and ninety degrees, and/or as dictated by construction and installation conditions.
- E. All manufactured steel parts and fittings shall be galvanized.

1.15 TOOLS AND EQUIPMENT

- A. Provide all tools and equipment required for the fabrication and installation of the mechanical and electrical equipment at the site.

1.16 PORTABLE AND DETACHABLE PARTS

- A. Contractors shall retain in their possession all portable and/or detachable parts and portions of materials, devices, equipment etc. necessary for the proper operation and maintenance of the mechanical and electrical systems until final completion of the work, at which time they shall be handed over to the Owner's Project Manager.

1.17 RECORD DRAWINGS, PROJECT CLOSEOUT

- A. Comply with requirements specified in Section 017700 – CONTRACT CLOSEOUT.
- B. This trade shall submit the record set for approval by the fire and building departments in a form acceptable to the departments, when required by the jurisdiction.
- C. Drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

1.18 GUARANTEE/WARRANTY

- A. Guarantee Work of this Section in writing for one year following the date of beneficial occupancy by the User Agency. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Designer's satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.
- B. In addition to guarantee requirements of Division 01 and of Subparagraph A above, obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in User Agency's name.

1. Upon receipt of notice from the Owner's Project Manager of failure of any part of the systems or equipment during the warranty period, the affected part or parts shall be replaced by this Contractor without any reimbursement.
2. At nine months into the one-year guarantee period, the contractor shall perform a 100% test of all installed equipment. Any device and/or part found to be defective shall be repaired and/or replaced at no additional cost.
3. Replace material and equipment that require excessive service during guarantee period as defined and as directed by Designer.
4. Provide 24 hour service beginning on the date the project is accepted by the Owner, whether or not fully occupied, and lasting until the termination of the guarantee period. Service can be provided by this contractor or a separate service organization. Choice of service organization shall be subject to Owner's Project Manager's approval. Submit name and a phone number that will be answered on a 24-hour basis each day of the week, for the duration of the service.
5. Submit copies of equipment and material warranties to Designer before final payment.
6. At end of guarantee period, transfer manufacturers' equipment and material warranties still in force to User Agency.
7. Provide manufacturer's engineering and technical staff at site to analyze and rectify problems that develop during guarantee period immediately. If problems cannot be rectified immediately to Owner's Project Manager's satisfaction, advise Designer in writing, describe efforts to rectify situation, and provide analysis of cause of problem. Designer will direct course of action.

1.19 OPERATING, INSTRUCTION AND MAINTENANCE MANUALS

- A. Refer to SECTION 017700 - CONTRACT CLOSEOUT for submittal procedures pertaining to operating and maintenance manuals.
- B. Each copy of the approved operating and maintenance manual shall contain copies of approved shop drawings, equipment literature, cuts, bulletins, details, equipment and engineering data sheets and typewritten instructions relative to the care and maintenance for the operation of the equipment, all properly indexed. Each manual shall have the following minimum contents:
 1. Table of Contents
 2. Introduction
 - a. Explanation of manual and its purpose and use.
 - b. Description of the electrical systems.
 - c. Safety precautions necessary for equipment.
 - d. Illustrations, schematics and diagrams.
 - e. Installation drawing.
 3. Maintenance
 - a. Maintenance and lubricating instructions.
 - b. Replacement charts.
 - c. Trouble shooting charts for equipment components.
 - d. Testing instructions for each typical component.
 - e. Two typed sets of instructions for ordering spare parts. Each set shall include name, price, telephone number and address of where they may be obtained.
 4. Manufacturer's Literature

- a. The equipment for which shop drawings have been submitted and approved.

1.20 SERVICE CHARACTERISTICS

- A. Primary Utility Voltage: N/A.
- B. Secondary Building Voltage - Low Level: 120/208V.
- C. All equipment and wiring shall be suitable for the applied voltage.

1.21 QUALITY ASSURANCE

- A. The requirements of the State Building Code and local regulations establish the minimum acceptable quality of workmanship and materials, and all work shall conform thereto unless more stringent requirements are indicated or specified herein.
- B. All work shall comply with the latest editions of the codes as referenced herein.
- C. Follow manufacturer's directions for articles furnished, in addition to directions shown on drawings or specified herein.
- D. Protect all work, materials, and equipment from damage during process of work. Replace all damaged or defective work, materials and equipment without additional cost to the Owner.
- E. All equipment and materials for permanent installation shall be the products of recognized manufacturers and shall be new.
- F. Equipment and materials shall:
 - 1. Where normally subject to Underwriters Laboratory Inc. listing or labeling services, be so listed or labeled.
 - 2. Be without blemish or defect.
 - 3. Not be used for temporary light and power purposes.
 - 4. Be in accordance with the latest applicable NEMA standards.
 - 5. Be products which will meet with the acceptance of all authorities having jurisdiction over the work. Where such acceptance is contingent upon having the products examined, tested and certified by Underwriters or other recognized testing laboratory, the product shall be so examined, tested and certified.
- G. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material of one generic type shall be the product of one manufacturer throughout.
- H. For items which are to be installed but not purchased as part of the electrical work, the electrical work shall include:
 - 1. The coordination of their delivery.
 - 2. Their unloading from delivery trucks driven into any point on the property line at grade level.
 - 3. Their safe handling and field storage up to the time of permanent placement in the project.

4. The correction of any damage, defacement or corrosion to which they may have been subjected. Replacement if necessary shall be coordinated with Contractor who originally purchased the item.
 5. Their field make-up and internal wiring as may be necessary for their proper operation.
 6. Their mounting in place including the purchase and installation of all dunnage, supporting members, and fastenings necessary to adapt them to architectural and structural conditions.
 7. Their connection to building wiring including the purchase and installation of all termination junction boxes necessary to adapt and connect them to this wiring. Included also shall be the purchase and installation of any substitute lugs or other wiring terminations as may be necessary to adapt their terminals to the building wiring as called for and to the connection methods set forth in these specifications.
- I. Items, which are to be installed but not purchased as part of the electric work, shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the electric work will be considered only if presented in writing within one week of the date of delivery to the project of the items in question. The electric work includes all procedures, regardless of how extensive, necessary to put into satisfactory operation, all items for which no claims have been submitted as outlined above.

1.22 DELIVERY, STORAGE AND HANDLING

- A. All materials for the work of this section shall be delivered, stored and handled so as to preclude damage of any nature. Manufactured materials shall be delivered and stored in their original containers, plainly marked with the products' and manufacturer's name. Materials in broken containers or in packages showing watermarks or other evidence of damage, shall not be used and shall be removed from the site.

1.23 PHASING, DEMOLITION AND MAINTAINING EXISTING SERVICES

- A. During the execution of the work, required relocation, etc., of existing equipment and systems in the existing building areas where new work is to be installed or new connections are scheduled to be made, shall be performed by the Electrical Subcontractor, as required by job conditions and as determined by the Designer in the field, to facilitate the installation of the new system, while demolition, relocation work or new tie ins will be performed. Outages required for construction purposes shall be scheduled for the shortest practical periods of time, in coordination with the User Agency's designated representative, for specified, mutually agreeable periods of time, after each of which the interruption shall cease and the service shall be restored. This procedure shall be repeated to suit the User Agency's working schedule, as many times as required until all work is completed. Any outages of service shall be approved the Owner's Project Manager, prior to commencing the work. No outages or shutdowns of service shall occur without the written authorization of the Owner's Project Manager prior to commencing the work. Give notice of any scheduled shutdowns, a minimum of weeks in advance. User Agency shall make their best efforts to meet this request without adversely affecting the electric service to the existing building.
- B. Prior to any deactivation and relocation or demolition work, consult the drawings and arrange a conference with the Designer and the Owner's Project Manager in the field to inspect each of the items to be deactivated, removed or relocated. Care shall be taken to

protect all equipment designated to be relocated and reused or to remain in operation and be integrated with the new systems.

- C. All deactivation, relocation and temporary tie ins of electrical systems and equipment shall be provided by the Electrical Subcontractor. All demolition and removal of electrical systems and equipment designed to be demolished shall be provided by the Electrical Subcontractor. Place all demolished electrical materials except hazardous materials. As determined by the Authority having jurisdiction in general contractors provided dumpster. All hazardous electrical materials shall be legally disposed by the electrical subcontractor.
- D. Owner's Project Manger reserves the right to inspect the material scheduled for removal and salvage any items he deems usable as spare parts.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Product specifications are written in such a manner so as to specify what materials may be used in a particular location or application and therefore do not indicate what is not acceptable or suitable for a particular location or application. As an example: non-metallic sheathed cable is not specified; therefore, it is not acceptable.
- B. For purpose of establishing a standard of quality and not for purpose of limiting completion, the basis of this Specification is upon specified models and types of equipment and materials, as manufactured by specified manufacturers.
- C. In all cases, standard cataloged materials and systems have been selected. Materials specially manufactured for this particular project and not part of a manufacturers standard product line will not be acceptable. In the case of systems, the system components shall be from a single source regularly engaged in supplying such systems. A proposed system made up of a collection of various manufacturers products will be unacceptable.
- D. Where Specifications list manufacturer's names and/or "as approved" or "Equal approved by Designer, other manufacturers equipment will be considered if equipment meets Specification requirements and has all features of the specified items as are considered essential by Designer.
- E. All materials shall be new and shall be UL listed.

2.02 RACEWAYS AND FITTINGS

- A. Raceways - General:
 - 1. No raceway shall be used smaller than 3/4" diameter. No conduit shall have more than three (3) 90° bends in any one run, and where necessary, pull boxes shall be provided. Intermediate metal conduit is not allowed.
 - 2. Rigid metal conduit conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be heavy wall zinc coated steel conforming to American Standard Specifications C80-1 and may be used for service work, exterior work, slab work, and below grade level slab, wet locations, and in mechanical rooms and where raceway may be subject to mechanical damage, i.e., loading docks, work shops, etc.

3. Thin wall conduit (EMT), conforming to, and installed in accordance with, Article 346 of NFPA 70 shall be zinc coated steel, conforming to industry standards, may be used in masonry block walls, stud partitions, above furred ceilings where exposed but not subject to mechanical damage, and shall be used for fire alarm work.
4. Flexible metal conduit shall be used for connections to motors. Liquid tight flexible metal conduit shall be used for the above connections which are located in moist locations. All flexible connections shall include a grounding conductor.
5. Acceptable manufacturers:
 - a. Pittsburgh Standard Conduit Company
 - b. Republic Steel and Tube
 - c. Youngstown Sheet Tube Company
 - d. Carlon
 - e. Perma-Cote Supreme
6. Fittings:
 - a. Provide insulated bushings on all raceways 1 inch diameter or larger.
 - b. Manufacturer's standard fittings shall be used for raceway supports.
 - c. Expansion Fittings: Expansion fittings shall be used where structural and concrete expansion joints occur and shall include a ground strap.
 - d. Couplings for rigid metal conduit shall be threaded type.
 - e. Threadless fittings for EMT shall be watertight compression type. Set-screw type fittings are not acceptable. All fittings shall be concrete tight. No diecast fittings allowed except for raceways larger than 1 inch diameter.
 - f. Cable supports in vertical raceways shall be of the split wedge type. Armored cable supports for vertical runs to be of wire mesh basket design.
 - g. Wall entrance seals shall be equal to O.Z. Gedney type "WSK".
 - h. Couplings, elbows and other fittings used with rigid nonmetallic raceways shall be of the solvent cemented type to secure a waterproof installation.
 - i. Acceptable manufacturers:
 - 1) O.Z.
 - 2) Crouse Hinds
 - 3) Appleton
 - 4) EFCOR
 - 5) Steel City

2.03 WIRING MATERIALS - 600V OR LESS SYSTEMS

- A. Conductors shall be copper with 600V insulation, THWN for branch circuitry and XHHW for feeders.
- B. Conductors shall be of soft drawn 98% minimum conductivity properly refined copper, solid construction where No. 10 AWG and smaller, stranded construction where No. 8 AWG and larger.
- C. Exterior of wires shall bear repetitive markings along their entire length indicating conductor size, insulation type and voltage rating.
- D. Exterior of wires shall be color coded, so as to indicate a clear differentiation between each phase and between each phase and neutral. In all cases, grounded neutral wires and cables shall be identified by the colors white or gray. In sizes and insulation types where factory applied colors are not available, wires and cables shall be color coded by the application of

approved colored plastic tapes in overlapping turns at all terminal points, and in all boxes in which splices are made. Colored tape shall be applied for a distance of 6 inches along the wires and cables, or along their entire extensions beyond raceway ends, whichever is less.

- E. Minimum conductor size shall be No. 12 AWG installed in conduit. Motor control circuit wiring shall be minimum No. 14 AWG installed in conduit.
- F. Other wires and cables required for the various systems described elsewhere in this section of the Specifications shall be as specified herein, as shown on the Contract Drawings, or as recommended by the manufacturer of the specific equipment for which they are used, all installed in conduit.
- G. Wiring materials shall be manufactured by Triangle, Republic, Anaconda, General Cable, or equal.

2.04 OUTLET, JUNCTION, PULL BOXES, AND WIRING TROUGHS FOR ALL SYSTEMS

- A. Outlets:
 - 1. Each outlet in wiring or raceway systems shall be provided with an outlet box to suit conditions encountered. Boxes installed in normally wet locations shall be of cast-metal type having hubs. Concealed boxes shall be cadmium plated or zinc coated sheet metal type. Old work boxes with Madison clamps not allowed in new construction.
 - 2. Each box shall have sufficient volume to accommodate number of conductors in accordance with requirements of NFPA 70. Boxes shall not be less than 1-1/2" deep unless shallower boxes are required by structural conditions and are specifically approved by Designer. Ceiling and bracket outlet boxes shall not be less than 4" octagonal except that smaller boxes may be used where required by particular fixture to be installed. Receptacle boxes shall be 4" square or of comparable volume.
 - 3. Acceptable manufacturers:
 - a. Appleton
 - b. Crouse Hinds
 - c. Steel City
 - d. RACO
- B. Pull and Junction Boxes: Where necessary to terminate, tap off, or redirect multiple raceway runs or to facilitate conductor installation, furnish, and install appropriately designed boxes. Boxes shall be fabricated from code gauge steel assembled with corrosion resistant machine screws. Box size shall be as required by Code. Where intermediate cable supports are necessary because of box dimensions, provide insulated removable core brackets to support conductors. Junction boxes are to be equipped with barriers to separate circuits. Where splices are to be made, boxes shall be large enough to provide ample work space. All conductors in boxes are to be clearly tagged to indicate characteristics. Boxes shall be supported independently of raceways. Junction boxes in moist or wet areas shall be galvanized type. Boxes larger than 4 inches square shall have hinged covers. Boxes larger than 12 inches in one dimension will be allowed to have screw fastened covers, if a hinged cover would not be capable of being opened a full 90 degrees due to installation location.

2.05 GROUNDING REQUIREMENTS

- A. Ground all systems and equipment in accordance with best industry practice, the requirements of NFPA 70 and the following:
- B. Provide grounding bonds between all metallic conduits of the 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.
- C. 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.
- D. Provide grounding bonds for all metallic conduits of the 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.
- E. 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.
- F. 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.
- G. 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.

2.06 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.

<u>120/208 V Circuits</u>	<u>277/480V</u>	<u>Phase Circuits</u>
1. Black	Brown	A
2. Red	Orange	B
3. Blue	Yellow	C
4. White	Grey	Neutral
5. Green	Green w/yellow tracer	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, 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.

2.07 ENCLOSURES FOR INDIVIDUALLY MOUNTED OVERCURRENT AND SWITCHING DEVICES.

- A. Construction shall be NEMA Class I, where installed indoors.
- B. Construction shall be NEMA Class IV, where installed outdoors, in mechanical rooms, in locations defined as damp or wet by NFPA 70 or where indicated as weatherproof.
- C. Operating handles shall be front or side type to accommodate hand access space and flush or surface mounting requirements.
- D. Each shall be equipped with padlock for locking operating handle in the open position

2.08 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 individually mounted circuit breakers shall have short circuit ratings exceeding the available short circuit 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
 - b. 480V Class Panels/Breakers shall be 65 kAIC.
 - 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 trip sizes 20 amps or less, they shall be rated for switching duty.
 - 8. They shall be equipped with 5 milliamp sensitivity ground fault interrupting features where so indicated.

- B. They shall be manufactured by Siemens to match existing in existing panels.

2.09 CARTRIDGE FUSES

- A. Cartridge fuses shall be as follows:
 - 1. Provide a complete set of fuses for each item of fusible type equipment. Fusible equipment furnished by other contractors will be complete with fuses.
 - 2. Secondary system fuses, rated at 600 volts or less, shall be UL listed and constructed in conformance with the applicable standards set forth by NEMA and ANSI. All fuses of a particular class shall be of same manufacturer.
 - 3. Regardless of actual fault current, they shall, at full recovery voltage, be capable of safely interrupting fault currents of 200,000 amperes RMS symmetrical or 340,000 amperes RMS asymmetrical, deliverable at the line side of the fuse.
 - 4. Circuits 0-600 amperes shall be protected by the equal of Bussman "Low Peak" current limiting fuses, LPN-RK (250 volts), LPS-RK (600 volts), UL class RK-1.
 - 5. Fuses shall be suitable for application to fuse gaps which reject other types of fusing.
 - 6. Supply 10 per cent spare fuses of each size and type 60 amps and less. Supply three spare fuses for each size and type over 60 amps.
- B. Cartridge fuses shall be manufactured by Bussman, Gould or EFCO.

2.10 MOTOR CONTROLS.

- A. Motor controls - Manual and Magnetic:
 - 1. Individually mounted magnetic starters shall be across-the-line type with thermal overload on each phase, single-speed, two-speed, or reduced voltage start as indicated. Check exact type of two-speed or part-winding motors to be furnished by other contractors, and provide proper starter.
 - 2. Starters shall be of the replaceable contact double break type, of size and type required for particular motor horsepower and voltage. Minimum size starter to be size 1.
 - a. Starters shall have OL reset button, green pilot light to indicate "ON", and "HAND-OFF-AUTO" switch in cover. Pilot lights shall be push-to-test type.
 - b. Provide proper rating of thermal overloads. Replace any overloads found to be of an incorrect rating. Provide a spare set of three thermal overloads for each starter.
 - c. Provide four (4) sets of auxiliary contacts of convertible type N.O. to N.C. for each starter.
 - d. Motor starters installed in dry locations shall have NEMA I enclosures. Those in wet locations shall have NEMA IV enclosures.
 - e. Acceptable Manufacturers:
 - 1) Allan Bradley
 - 2) General Electric
 - 3) Cutler Hammer
 - 4) Square D
 - 3. Manual motor starters shall have pilot lights and shall be furnished with thermal overloads on each phase.

- B. Motors: Each motor shall have disconnect switch and starter provided under this section. Starters which are a part of "factory assembled" control panel will be provided under section supplying equipment to be controlled but connected under this section.
 - 1. Provide motor terminal boxes for each motor not furnished with same.

- C. Disconnect Switches:
 - 1. Disconnect (safety) switches shall conform to industrial standards of NEMA, be UL listed and shall be heavy duty type, quick-make, quick-break type with interlocking cover mechanism and provisions for padlocking switch handle in "OFF" position. Three pole toggle switches are not acceptable as substitute for disconnect switches.
 - 2. Disconnect switches shall be of fused or unfused type as indicated with number of disconnecting poles indicated. The grounded conductor shall not be switched. Switches shall be for use with current limiting fuses with rejection type fuse clips and those shall be horsepower rated.
 - 3. Enclosures shall be of proper NEMA type for the intended location and shall be phosphate coated or equivalent code gauge galvanized sheet steel with gray baked enamel finish.
 - 4. Acceptable Manufacturers:
 - a. General Electric
 - b. Cutler Hammer
 - c. Square D

- D. Combination Starter
 - 1. Provide combination starters where indicated on the plans.

- E. Motor Control Circuitry
 - 1. Except as noted below, select materials exactly as specified for feeders. Utilize No. 12 A.W.G. THWN conductors throughout minimum.
 - 2. Motor control circuit wires may be run in the same conduit as the wires of motor power circuits; however, exclude motor control wires from enclosures (other than motor starter enclosures) which contain power circuit overcurrent protection and switching devices; also from pull boxes and junction boxes containing the wires of main and submain feeders. Utilize auxiliary pull boxes to separate motor control wires from motor power circuit wires before the power circuit wires enter the items from which motor control wires are excluded.
 - 3. Prior to installing any motor control circuitry for a particular motor, notify the Designer of any deviations between the control circuitry requirements of the trade supplying the motor and the indicated electric work.

2.11 EQUIPMENT GROUNDING REQUIREMENTS

- A. Equipment ground all systems and equipment in accordance with best industry practice.

- B. Bond metallic conduits containing grounding electrode conductors and main bonding conductors to the ground bus service enclosure at both ends of each run utilizing grounding bushings and jumpers.

- C. Provide grounding bonds for all metallic conduits of the 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.

- D. 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.
- E. 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.
- F. Bonding conductors on the load size 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.
- G. Each branch circuit and feeder shall have a dedicated equipment grounding conductor, minimum # 12 AWG. Shared or tapped equipment grounding conductor shall not be acceptable.

PART 3 - EXECUTION

3.01 BASIC REQUIREMENTS

- A. Adhere to best industry practice and the following.
- B. All work shall be concealed.
- C. Route circuitry runs embedded in concrete to coordinate with structural requirements.
- D. Equip each raceway intended for the future installation of wire or cable with a nylon pulling cord 3/16 inch in diameter and clearly identify both ends of the raceway.
- E. Provide all outlet boxes, junction boxes, and pull boxes for proper wire pulling and device installation. Include those omitted from the drawings due to symbolic methods of notation.
- F. Beyond the termination of raceways, fireproof the following:
 - 1. Fireproofing of wires and cables shall be by means of a half-lapped layer of arcproof or by means of sleeving of a type specifically manufactured for the purpose. Ends of tape or sleeving shall be served with twine. Fireproofing shall be extended up into raceways. After conductors have been finally shaped into their permanent configuration, fireproofing tape or sleeving shall be coated with silicate of soda (water glass). Fireproofing shall be applied in an overall manner to raceway groupings of conductors.
- G. Provide all sleeves through fireproof and waterproof slabs, walls, etc. required for electric work.
 - 1. Provide waterproof sealing for the sleeves through waterproof slabs, walls, etc.
 - 2. Provide fireproof sealing for the sleeves through fireproof walls, slabs, etc.
 - 3. Provide fireproof sealing for the openings in fireproof walls, slabs, etc., resulting from removal of existing electrical sleeves, conduits, poke-thru's, etc.

- H. Bundle wiring passing through pull boxes and panel boards in a neat and orderly manner with plastic cable ties. Cable ties shall be Ty-Raps as manufactured by Thomas & Betts, Holub Industries Inc., Quick Wrap, Bundy Unirap or equal.
- I. Turn branch circuits and auxiliary system wiring out of wiring gutters at 90 degrees to circuit breakers and terminal lugs.

3.02 TESTING REQUIREMENTS AND INSTRUCTIONS

- A. The Electrical Subcontractor shall provide supervision, labor, materials, tools, test instruments and all other equipment or services and expenses required to test, adjust, set, calibrate, and operationally check work and components of the electrical systems and circuitry throughout the work.

The Electrical Subcontractor shall pay for all tests specified in this Section, including expenses incident to retests occasioned by defects and failures of equipment to meet specifications, at no additional cost to the Owner. Any defects or deficiencies discovered in any of the electrical work shall be corrected.

The Electrical Subcontractor shall:

1. Replace wiring and equipment found defective (defined as failing to meet specified requirements) at no additional cost to the Owner.
 2. Submit three copies of test results to the engineer.
- B. Do not void equipment warranties or guarantees by testing and checkout work. Checks and tests shall be supplemental to and compatible with the manufacturer's installation instructions. Where deviations are apparent, obtain the manufacturer's approved review of procedure prior to testing. Where any repairs, modifications, adjustments, tests or checks are to be made, the Contractor shall contact the engineer to determine if the work should be performed by or with the manufacturer's representative.

All checks and tests specified for proper operating and safety of equipment and personnel are to be performed concurrent with progression of the work, prior to Final Acceptance by the Owner.

- C. Test are to:
 1. Provide initial equipment/system acceptance.
 2. Provide recorded data for future routine maintenance and trouble shooting.
 3. Provide assurance that each system component is installed satisfactorily and can be expected to perform, and continue to perform, its specified function with reasonable reliability throughout the life of the facility.
- D. At any stage of construction and when observed, any electrical equipment or system determined to be damaged, or faulty, is to be reported to the engineer. Corrective action by the Contractor requires prior engineer approval, retesting, and inspection.
- E. Prior to testing and start-up, equipment and wiring shall be properly and permanently identified with nameplates, and other identification as specified in this Section. Check and tighten terminals and connection points, remove shipping blocks and thoroughly clean equipment, repair damaged or scratched finishes, inspect for broken and missing parts and

review and collect manufacturer's drawings and instructions for delivery to the engineer. Make routine checks and tests as the job progresses to ensure that wiring and equipment is properly installed.

- F. Testing and checkout work is to be performed with fully qualified personnel skilled in the particular tests being conducted. Personnel are to have at least five years of experience with tests of same type and size as specified:
- G. Inspections and tests shall be in accordance with the following applicable codes and standards as amended to date, unless otherwise specified.
 - 1. National Electrical Manufacturer's Association - NEMA.
 - 2. American Society for Testing and Materials - ASTM.
 - 3. Institute of Electrical and Electronic Engineers -IEEE.
 - 4. National Electrical Testing Association - NETA.
 - 5. American National Standards Institute - ANSI.
 - a. C2: National Electrical Safety Code.
 - b. Z244-1: American National Standard for Personnel Protection.
 - 6. Insulated Cable Engineers Association - ICEA.
 - 7. Occupational Safety and health Administration.
 - a. OSHA Part 1910; Subpart S, 1910.308.
 - b. OSHA Part 1926; Subpart V, 1926.950 through 1926.960.
 - 8. National Fire Protection Association - NFPA.
 - a. 70B: Electrical Equipment Maintenance.
 - b. 70E: Electrical Safety Requirements for Employer Workplaces.
 - c. 70: National Electrical Code.
 - 9. Inspections and tests shall utilize the following references:
 - a. Contract Drawings and Specifications.
 - b. Contractor's Short Circuit and Coordination Study.
 - c. Manufacturer's printed test procedures for respective equipment.
- H. Test Equipment:
 - 1. Test equipment used by the Contractor is to be inspected and calibrated.
 - 2. Perform calibration and setting checks with calibrated test instruments of at least twice that of that of the accuracy of the equipment, device, relay or meter under test. Dated calibration labels shall be visible on test equipment. Calibrations over 6 months old are not acceptable on field test instruments. Inspect test instruments for proper operation prior to proceeding with the tests. Record serial and model numbers of the instruments used on the test forms.
- I. Test Procedures:
 - 1. The Electrical Subcontractor is responsible for the preparation of the procedures and schedules for the work specified herein. This work is to be coordinated and compatible with both the work and schedule of the other crafts. Sequence the tests and checks so that the equipment can be energized immediately after the completion of the application tests.
 - 2. Submit proposed testing and check out forms. The procedures shall provide specific instructions for the checking and testing of each electrical component of each system. Schedule tests and inspections as the job progresses. Test procedures submitted shall include job safety rules.
- J. After each electrical system installation is complete, perform the tests to determine that the entire system is in proper working order and in accordance with applicable codes,

manufacturer's instructions, drawings, and specifications. Tests are in addition to shop tests of individual items at the manufacturer's plant. Perform insulation and ground resistance tests before operating tests.

- K. Perform insulation tests on electrical equipment, apparatus, cables, motors, circuit breakers and switches, and similar electrical equipment, at the following times and conditions:
 - 1. Prior to energization and/or placing into service.
 - 2. When damage to the insulation is suspected or known to exist.
 - 3. After repairs or modifications to the equipment affecting the insulation.
 - 4. Where lightning or other surge conditions are known to have existed on the circuit.

- L. Make openings in circuits for test instruments and place and connect instruments, equipment, and devices, required for the tests. Upon completion of tests, remove instruments and instrument connections and restore circuits to permanent condition.

- M. List each circuit and measured resistance as test data. Maintain record of insulation resistance values. Identify conductor, or equipment, date that value was taken and resistance value. Arrange information in tabular form and submit to Engineer.

- N. Report inspections, tests, and calibrations in writing on engineer-approved reports/forms. The recorded data form shall have the signatures of the persons conducting the tests, authorized witnesses, and the engineer. The forms shall serve as the test and inspection checklist.

- O. When the electrical tests and inspections specified or required within this Section are completed and results reported, reviewed, and approved by the engineer, the Contractor may consider that portion of the electrical equipment system or installation electrically complete. The Contractor will then affix appropriate, approved, and dated completion or calibration labels to the tested equipment and notify the engineer of electrical completion. If the engineer finds completed work unacceptable, he will notify the Contractor in writing of the unfinished or deficient work, with the reason for his rejection, to be corrected by the Contractor. The Contractor will notify the engineer in writing when exceptions have been corrected. The Contractor will prepare a "Notification of Substantial Electrical Completion" for approval by the engineer following engineer's acceptance of electrical completion. If later in-service operation or further testing identifies problems attributable to the Contractor, these will be corrected by the Contractor, at no additional cost to the Authority.

- P. Specific Tests:
 - 1. Perform the following specific tests. De-energize and isolate equipment and cable prior to performing the tests.
 - 2. Grounding Systems:
 - a. Test major equipment grounds to remote earth, directly referenced to an extremely low resistance (approximately 1 ohm) reference ground bench mark. Perform a visual inspection of the systems, raceway and equipment grounds to determine the adequacy and integrity of the grounding. Ground testing results shall be recorded, witnessed, and submitted to the engineer.
 - b. Perform ground tests using a low resistance, Null balance type, ground testing ohmmeter, with test lead resistance compensated for. Use the type of test instrument which compensates for potential and current rod resistances.

- c. Test major equipment grounding system for continuity of connections and for resistance. Ground resistance of conduits, equipment cases, and supporting frames, shall not vary from that of system as a whole and shall not exceed 5 ohms to ground. Submit all readings to the engineer.
 - d. Where ground test results identify the need for additional grounding conductors or rods that are not indicated or specified, design changes will be initiated to obtain the acceptable values. The Contractor is responsible for the proper installation of the grounding indicated and specified.
3. Wire and Cable: (All conductors originating from main switchboard and distribution panels).
- a. Before energizing any cable or wire, megger the insulation resistance of every external circuit wire to each other and to ground. Tests shall be conducted at voltages of 500 volts or lower. Continuity test each wire and cable to verify the field applied tag per conductor. Minimum insulation resistance values shall not be less than two megohms.
 - b. Take insulation resistance measurements for motor feeders. With motors disconnected, measure insulation resistance from load side of contactors or circuit breakers.
 - c. Check cables and wires for the proper identification numbering and/or color coding.
 - d. Inspect cables for physical damage and proper connection in accordance with single line diagram.
4. Power Distribution System:
- a. Circuit Breakers - Molded Case
 - 1) Circuit breaker shall be checked for proper mounting, conductor size and feeder designation.
 - 2) Operate circuit breaker to ensure smooth operation.
 - 3) Inspect case for cracks or other defects.
 - 4) Check tightness of connections with calibrated torque wrench. Refer to manufacturer's instruction for proper torque levels.
 - 5) Perform a contact resistance test or measure millivolt drop at rated current.
 - 6) Perform an insulation resistance test at 1000 volts dc for one (1) minute from pole-to-pole and from each pole-to-ground with breaker closed and across open contacts of each phase - 500V D.C. if circuit breaker is solid state.
 - 7) Adjustable trip breakers shall have minimum pickup current determined by primary current injection where applicable.
 - 8) Perform long time delay time-current characteristic tests by passing three hundred percent (300%) rated current through each pole separately. Determine trip time.
 - 9) Determine short time pickup and delay by primary current injection if applicable to the particular breaker.
 - 10) Determine ground fault pickup and time delay by primary current injection if applicable to the particular breaker.
 - 11) Determine instantaneous pickup current by primary injection using run-up or pulse method. Clearing times shall be within four (4) cycles.
 - 12) Verify trip unit reset characteristics.
 - 13) Perform adjustments for final settings in accordance with breaker setting sheet if applicable to the particular breaker.

- 14) Compare contact resistance or millivolt drop values to adjacent poles and similar breakers. Investigate deviations of more than fifty percent (50%). Investigate any value exceeding manufacturer's recommendations.
 - 15) Insulation resistance shall not be less than 100 megohms.
 - 16) Trip characteristic of adjustable trip breakers shall fall within manufacturer's published time-current characteristic tolerance band.
 - 17) All circuit breakers mounted in switchboards and distribution boards shall be time-current tested by primary current injection where possible, and also any remotely mounted breakers of frame size 400 ampere and larger.
 - 18) Adjust settings and calibrate all circuit breakers as recommended in the short circuit analysis and coordination study.
- b. Operating Instructions: Furnish operating instructions to User Agency's designated representative with respect to operations, functions and maintenance procedures for equipment and systems installed. Cost of such instruction up to a full five (5) days of Electrical Subcontractor's time shall be included in contract. Cost of providing a manufacturer's representative at site for instructional purposes shall also be included.

3.03 BRANCH CIRCUITRY

- A. For all lighting and appliance branch circuitry, raceway sizes shall conform to industry standard maximum permissible occupancy requirements except where these are exceeded by other requirements specified elsewhere.
- B. Circuits shall be balanced on phases at their supply as evenly as possible.
- C. Feeder connections shall be in the phase rotation which establishes proper operation for all equipment supplied.
- D. Reduced size conductors indicated for any feeders shall be taken as their grounding conductors.
- E. Feeders consisting of multiple cables and raceways shall be arranged such that each raceway of the feeder contains one cable for each leg and one neutral cable, if any.
- F. For circuitry indicated as being protected at 20 Amps or less, abide by the following:
 1. All 20 amp, 120/208 volt, 3 phase, 4 wire combined branch circuit homeruns shall be provided with a #8 AWG neutral conductor.
 2. Minimum conductor size shall be No. 12 A.W.G. copper.
 3. Conductors operating at 120 volts extending in excess of 100 Ft., or at 277 volts extending in excess of 200 ft., or the last outlet or fixture tap shall be No. 10 A.W.G. copper throughout.
 4. Circuits shall be balanced on phases at their supply point as evenly as possible.

3.04 REQUIREMENTS GOVERNING ELECTRICAL WORK IN DAMP OR WET LOCATIONS

- A. Outlets and outlet size boxes shall be of galvanized cast ferrous metal only.
- B. The finish of threaded steel conduit shall be galvanized only.

- C. Wires for pulling into raceways for lighting and appliance branch circuitry shall be limited to "THWN".
- D. Wires for pulling into raceways for feeders shall be limited to "THWN".
- E. Plates for toggle switches and receptacles shall have gasketed snap shut covers suitable for wet locations while in use.
- F. Final connections of flexible conduit shall be neoprene sheathed.
- G. Apply one layer of half looped plastic electric insulating tape over wire nuts used for joining the conductors of wires.
- H. Enclosures, junction boxes, pull boxes, cabinets, cabinet trims, wiring troughs and the like, shall be fabricated of galvanized sheet metal, shall conform to the following:
 - 1. They shall be constructed with continuously welded joints and seams.
 - 2. Their edges and weld spots shall be factory treated with cold galvanizing compound. Their connection to circuitry shall be by means of watertight hub connectors with sealing rings.
- I. Enclosures for individually mounted switching and overcurrent devices shall be NEMA Class IV weatherproof construction.
- J. The covers, doors and plates and trims used in conjunction with all enclosures, pull boxes, outlet boxes, junction boxes, cabinets and the like shall be equipped with gaskets.
- K. The following shall be interpreted as damp or wet locations within building confines:
 - 1. Spaces where any designations indicating weatherproof (WP) or vaporproof appear on the drawings.
 - 2. Spaces defined as wet or damp locations by article 100 of the National Electric Code.

3.05 IDENTIFICATION AND TAGGING

- A. Identify individually:
 - 1. Each motor starter.
 - 2. Each safety disconnect switch.
 - 3. Each circuit breaker.
 - 4. Each feeder, wire or cable of all systems.
 - 5. Each end of nylon pullwire in empty conduit.
- B. Each wire or cable in a feeder shall be identified at its terminal points of connection and in each pullbox, junction box and panel gutter through which it passes.
- C. The nomenclature used to identify panelboards or load center shall designate the numbers assigned to them.
- D. The nomenclature used to identify switches or circuit breakers shall:
 - 1. Where they disconnect mains or services designate this fact.

2. Where they control feeders, designate the feeder number and the name of the load supplied.
 3. Where they control appliance branch circuitry, designate the name of the space and the load supplied.
- E. The nomenclature used to identify feeder wires and cables shall designate the feeder number.
- F. Identification for switches or circuit breakers shall be by means of the following:
1. Where individually enclosed -- engraved lamaroid nameplates showing 1/8" high white lettering on a black background fastened on the outside front face of the enclosure.
 2. Where in panelboards or load centers with doors -- typewritten directories mounted behind transparent plastic covers, in metal frames fastened on the inside face of the doors.
- G. Identification for wires and cables shall be by means of wrap around "brady" type labels.
- H. Phase identification letters shall be stamped into the metal of the bus bars of each phase of the main busses of each switchboard and each panelboard. The letters shall be visible from at least one "normal posture" location without having to demount any current carrying or supporting elements.
- I. Identify each outlet box, junction box, and cabinet used in conjunction with empty raceway for wires of a future system by means of indelible markings on the inside denoting the system.
- J. Prior to installing identifying tags and nameplates, submit their nomenclature for approval. Conform to all revisions issued by the Designer.

3.06 LIMITING NOISE PRODUCED BY ELECTRICAL INSTALLATION

- A. Perform the following work, in accordance with field instructions issued by the Designer to assure that minimal noise is produced by electrical installations due to equipment furnished as part of the electrical work.
- B. Check and tighten the fastenings of sheet metal plates, covers, doors and trims used in the enclosures of electrical equipment.
- C. Remove and replace any individual device containing one or more magnetic flux path metallic cores which is found to have a noise output exceeding that of other identical devices installed at the project.

3.07 SUPPORTS AND FASTENINGS

- A. Support work in accordance with best industry standards, State Electrical Code and the following:
- B. Include supporting frames or racks for equipment, intended for vertical surface mounting, which is required in a free standing position.

- C. Supporting frames or racks shall be of standard angle, standard channel or specialty support system steel members. They shall be rigidly bolted or welded together and adequately braced to form a substantial structure. Racks shall be of ample size to assure a workmanlike arrangement of all equipment mounted on them.
- D. No work intended for exposed installation shall be mounted directly on any building surface. In such locations, flat bar members or spacers shall be used to create a minimum of 1/4" air space between the building surfaces and the work. Provide 3/4" thick exterior grade plywood painted with two coats of fire-retardant grey paint for mounting of panelboards.
- E. Nothing (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways or cables for support.
- F. Nothing shall rest on, or depend for support on, suspended ceiling media.
- G. Support less than 2" trade size, vertically run, conduits at intervals no greater than 8 Ft. Support such conduits, 2-1/2" trade size or larger, at intervals no greater than the story height, or 15 Ft, whichever is smaller.
- H. Where they are not embedded in concrete, support less than 1" trade size, horizontally run, conduits at intervals no greater than 7 ft.. Support such conduits, 1" trade size or larger, at intervals no greater than 10 ft.
- I. As a minimum procedure, in suspended ceilings support small runs of circuitry (e.g., conduit not in excess of 1 inch trade size) from ceiling suspension members as defined above. Support larger runs of circuitry directly from structural slabs, decks or framing members.
- J. Fasten electric work to building structure in accordance with the best industry practice.
- K. Floor mounted equipment shall not be held in place solely by its own dead weight. Include floor anchor fastenings in all cases.
- L. For items which are shown as being ceiling mounted at locations where fastenings to the building construction element above is not possible, provide suitable auxiliary channel or angle iron bridging tying to building structural elements.
- M. As a minimum procedure, where weight applied to the attachment points is 100 lbs. or less, fasten to concrete and solid masonry with bolts and expansion shields.
- N. As a minimum procedure, where weight applied to building attachment points exceeds 100 lbs., but is 300 lbs. or less, conform to the following:
 - 1. At field poured concrete slabs, utilize inserts with 20' minimum length slip-through steel rods, set transverse to reinforcing steel.

3.08 SPLICING AND TERMINATING WIRES AND CABLES

- A. Maintain all splices and joints in removable cover boxes or cabinets where they may be easily inspected.
- B. Locate each completed conductor splice or joint in the outlet box, junction box, or pull box containing it, so that it is accessible from the removal cover side of the box.

- C. Join solid conductors No. 8 AWG and smaller by securely twisting them together and soldering, or by using insulated coiled steel spring "wire nut" type connectors. Exclude "wire nuts" employing non-expandable springs. Terminate conductors No. 8 AWG and smaller by means of a neat and fast holding application of the conductors directly to the binding screws or terminals of the equipment or devices to be connected.
- D. Join, tap and terminate stranded conductors No. 6 AWG and larger by means of solder sleeves, taps; and lugs with applied solder or by means of bolted saddle type or pressure indent type connectors, taps and lugs. Exclude connectors and lugs of the types which apply set screws directly to conductors. Where equipment or devices are equipped with set screw type terminals which are impossible to change, replace the factory supplied set screws with a type having a ball bearing tip. Apply pressure indent type connectors, taps and lugs utilizing tools manufactured specifically for the purpose and having features preventing their release until the full pressure has been exerted on the lug or connector.
- E. Except where wire nuts are used, build up insulation over conductor joints to a value, equal both in thickness and dielectric strength, to that of the factory applied conductor insulation. Insulation of conductor taps and joints shall be by means of half-lapped layers of rubber tape, with an outer layer of friction tape; by means of half-lapped layers of approved plastic electric insulating tape; or by means of split insulating casings manufactured specifically to insulate the particular connector and conductor, and fastened with stainless steel or non-metallic snaps or clips.
- F. Exclude splicing procedures for neutral conductors in lighting and appliance branch circuitry which utilize device terminals as the splicing points.
- G. Exclude joints or terminations utilizing solder in any conductors used for grounding or bonding purposes.
- H. Exclude all but solder or pressure indent type joints in conductors used for signaling or communications purposes.
- I. Lugs for conductors used to make phase leg connections on the line side of the main service overcurrent and switching device shall be of the limiter type.

3.09 PULLING WIRES INTO CONDUITS AND RACEWAYS

- A. Delay pulling wires or cables in until the project has progressed to a point when general construction procedures are not liable to injure wires and cables, and when moisture is excluded from raceways.
- B. Utilize nylon snakes or metallic fish tapes with ball type heads to set up for pulling. In raceways 2" trade size and larger, utilize a pulling assembly ahead of wires consisting of a suitable brush followed by an 3-1/2" diameter ball mandrel.
- C. Leave sufficient slack on all runs of wire and cable to permit the secure connection of devices and equipment.
- D. Include circular wedge-type cable supports for wires and cables at the top of any vertical raceway longer than 20 feet. Also include additional supports spaced at intervals which are

no greater than 10'. Supports shall be located in accessible pull boxes. Supports shall be of a nondeteriorating insulating material manufactured specifically for the purpose.

- E. Pulling lubricants shall be used. They shall be products manufactured specifically for the purpose.
- F. Slack on wires and cables located in cabinets and pull boxes shall be formed and set in place in groupings corresponding to their occupancy of raceways. They shall also be arranged, with insulators and supports provided where necessary, such that cable shims or other such temporary expedients do not have to be left permanently in place to prevent the wires and cables from shifting when covers or trims are removed.

3.10 REQUIREMENTS FOR THE INSTALLATION OF JUNCTION BOXES, OUTLET BOXES AND PULL BOXES

- A. Flush wall mounted outlet boxes shall not be set back to back but shall be offset at least 12" horizontally regardless of any indication on the drawings.
- B. Locate all boxes so that their removable covers are accessible without necessitating the removal of parts of permanent building structure, including piping, ductwork, and other permanent mechanical elements.
- C. In conjunction with concealed circuitry, abide by one of the following instructions (as may be applicable to the conditions) in order to assure the aforementioned accessibility. (Not required for circuitry concealed by removable suspended ceiling tiles.)
 - 1. For a small (outlet size) box on circuitry concealed in a partition or wall, locate box or fitting so that its removable cover side (or the face of any applied raised cover) penetrates through to within 1/8" of the exposed surface of the building materials concealing the circuitry and apply a blank or device plate to suit the functional requirements.
 - 2. For a large box on circuitry concealed in a partition, suspended ceiling, or wall, locate box totally hidden but with its removable cover directly behind an architectural access door or panel (included for the purpose, separate from the electric work) in the building construction which conceals the circuitry.
 - 3. For a small (outlet size) box on circuitry concealed above and intended as an outlet for a surface mounted lighting fixture or other such electrical item, locate box so that its removable cover side penetrates through to the exposed surface of the building materials concealing the circuitry. Arrange the mounting of the lighting fixture or other item so that it completely covers the opening in the building construction caused by the box.
 - 4. For a small (outlet size) box on circuitry concealed in a suspended ceiling, and intended as an outlet for a non-demountable type of recessed lighting fixtures or other such electrical items, locate box totally hidden but with its removable cover not more than one foot away from the building construction opening occupied by the demountable items.
- D. Apply junction and pull boxes in accordance with the following:
 - 1. Include pull boxes in long straight runs of raceway to assure that cables are not damaged when they are pulled in.
 - 2. Include junction and pull boxes to assure a neat and workmanlike installation of raceways.

3. Include junction and pull boxes to fulfill requirements pertaining to the limitations to the number of bends permitted in raceway between cable access points, the accessibility of cable joints and splices, and the application of cable supports.
 4. Include all required junction and pull boxes regardless of indications on the drawings (which, due to symbolic methods of notation, may omit to show some of them).
- E. Apply outlet boxes in accordance with the following:
1. Unless noted below or otherwise specifically indicated, include a separate outlet box for each individual wiring device.
 2. Include all required outlet boxes regardless of indications on the drawings (which due to symbolic methods of notation, may omit to show some of them).
- F. Install junction boxes, pull boxes and outlet boxes in accordance with the following:
1. Exclude surface mounted outlet boxes in conjunction with concealed circuitry.
 2. Exclude unused circuitry openings in junction and pull boxes. In larger boxes each such opening shall be closed with a galvanized sheet steel plate fastened with a continuous weld all around. In small outlet type boxes, utilize plugs as specified for such boxes.
 3. Close up all unused circuitry openings in outlet boxes. Unused openings in cast boxes shall be closed with approved cast metal threaded plugs. Unused openings in sheet metal boxes shall be closed with sheet metal knock-out plugs.
 4. Boxes and plaster covers for duplex receptacles shall be arranged for vertical mounting of the receptacle.
 5. Equip outlet boxes used for devices which are connected to wires of systems supplied by more than one set of voltage characteristics with barriers to separate the different systems.

3.11 LOCATING AND ROUTING OF CIRCUITRY

- A. In general, all circuitry shall be run concealed except that it shall be run exposed where the following conditions occur:
1. Horizontally at the ceiling of permanently unfinished spaces which are not assigned to mechanical or electrical equipment.
 2. Horizontally and vertically in mechanical equipment spaces.
 3. Horizontally and vertically in electric equipment rooms.
- B. Concealed circuitry shall be so located that building construction materials can be applied over its thickest elements without being subject to spalling or cracking.
- C. All circuitry and raceways shall not be run within slabs. If for field conditions requires raceways to be embedded in field poured structural building construction concrete fill or slab shall conform to the following:
1. All proposed embedded raceways shall be indicated on plan and elevation and submitted to the Designer and Structural Engineer for review and written approval prior to installation. Any costs associated with the review and approval shall be borne by the Electrical Subcontractor.
 2. They shall be run "single layer" with their outside surface no closer than 1" to any surface of the structural concrete.

3. They shall not be located in any configuration which places the outside surface of one closer than 3" to the outside surface of another, except at tees, crosses or other single level wide angle junction points.
 4. Where crossovers or close grouping are unavoidable, circuitry shall be carefully field coordinated so as not to cause structural weakness.
 5. Where turned up or down into a wall or partition they shall, before entering same, be routed parallel for a long enough distance to assure that no relocation of the wall or partition will be necessary to conceal the required bend.
 6. They shall be routed in such a manner as to coordinate with the structural requirements of the building.
 7. They shall be routed in accordance with field instructions issued by the Designer where such instructions differ from specifications set forth herein.
- D. Circuitry run exposed shall be routed parallel to building walls and column lines.
- E. Exposed circuitry located overhead shall be run in a completely accessible manner on the underside of all piping and ductwork.
- F. Circuitry run in suspended ceilings shall be routed parallel to building walls, column lines, etc.
- G. Circuitry shall be routed so as to prevent electric conductors from being subject to high ambient temperature. Minimum clearances from heated lines or surfaces shall be maintained as follows:
- | | | |
|----|------------------------------------|-----|
| 1. | Crossing where uninsulated | 3" |
| 2. | Crossing where insulated | 1" |
| 3. | Running parallel where uninsulated | 36" |
| 4. | Running parallel where insulated | 6" |
- H. Circuitry shall not be run in elevator shafts, hoistways, and the like. Where outlets for trail cables, pit lights, run be level lights, and the like, are involved, only the "final connection" outlet boxes themselves shall be located within or open into, the confines of the shaft.
- I. Circuitry for miscellaneous systems indicated without notation as to location and routing shall be run as per the requirements and notations governing the adjacent light and power circuitry.

3.12 INSTALLING CIRCUITRY

- A. The outside surface of circuitry which is to be embedded in cinder concrete shall be coated with asphaltum paint.
- B. In runs of conduit or raceway including flexible limit the number of bends between cable access points to a total which does not exceed the maximum specified for the particular system. Where no such maximum is specified, limit the number to four right angle bends or the equivalent thereof.
- C. In each conduit or raceway assigned for the future pulling in of wires, include a nylon drag cord. In raceways 2" trade size and larger, the cord shall be pulled in utilizing a suitable brush, followed by an 85% diameter ball mandrel ahead of the cord in the pulling assembly. In the event that obstructions are encountered, which will not permit the drag cord to be

installed, the blocked section of raceway shall be replaced and any cutting and patching of the structure involved in such replacement shall be included as part of the electric work.

- D. Circuitry shall be arranged such that conductors of one feeder or circuitry carrying "going" current are not separated from conductors of the same feeder or circuitry carrying "return" current by any ferrous or other metal. Where not within raceways, all "going" and "return" current conductors of one feeder or circuit shall be laced together so as to minimize induction heating of adjacent metal components.
- E. Sleeves used where circuitry is to penetrate waterproof slabs, decks and walls, shall be of a type selected to suite the water condition encountered in the field.

END OF SECTION