SEABROOK RECREATION CENTER BOILER PROJECT INVITATION TO BID

Date: September 10, 2019

To: Interested Mechanical Contractors

INVITATION TO BID

You are invited to submit a stipulated sum proposal for the furnishing of all permitting, taxes, documentation, materials, equipment, services, labor and supervision necessary for and/or reasonably incidental to the Proposed Recreation Center Boiler Replacement Project, Seabrook, NH

A. PREBID MEETING

1.) A pre-bid meeting will be held at the project location on October 3, 2019 at 11:00 AM. Bidders will meet at the front entrance to the Seabrook Recreation Center.

2.) **Please confirm your attendance by email to scaulfield@hlturner.com.**

3.) Questions, attendance or additional information should be directed to the attention of Steve Caulfield of HL Turner Group at (207) 400-1035, or by email scaulfield@hlturner.com.

4.) Questions/RFI's shall be taken up to the pre-bid meeting.

B. DISCREPANCIES

1.) Should a Bidder find discrepancies or ambiguities in, or omissions from, the drawings or specifications, or should he be in doubt as to their meaning, he shall at once notify The HL Turner Group here after referred to as the consultant, who will send a written bulletin to all Bidders.

2.) Bidders are responsible for all dimensions, building areas, and verifying existing conditions.

C. FORMS

1.) All proposals must be submitted on the prepared Bid forms and shall be subject to all requirements of the drawings, the specifications, and any other documents issued in connection with the above including this Invitation to Submit a Proposal.

2.) Voluntary alternates are not allowed unless prior approval from HL Turner.

3.) Attention is directed to the fact that the specifications include a set of bidding and contract forms. These are for bidding purposes on this project.

4.) A hard copy must be mailed.

5.) All blank spaces on forms must be filled in.

6.) The signature must be in longhand and executed by a principal duly authorized to make contracts. The Bidder's legal name must be fully stated.

D. SUBMISSION OF PROPOSALS

Sealed proposals will be received by the Owner no later than 3:00 PM October 10, 2019:

Ms. Shaylia Marquis, Procurement Manager
Town of Seabrook
99 Lafayette Road
Seabrook, NH 03874

1.) The Owner reserves the right to reject any/all proposals without explanation, to waive all formality in connection with bid opening, and to waive any informality in the proposals.

2.) The opening of the bid proposals will be public. Determination will be based upon all pertinent data contained in the proposals.

3.) Proposals submitted by the Contractor, as a result of this invitation to submit a Proposal, shall not obligate the Owner in any way.

E. THE BID

The bid shall be for the completed job as specified herein.

F. VALIDITY

All bids submitted shall remain valid for a period of not less than 30 calendar days from the Bid date.

INSTRUCTION TO BIDDERS

I. PROJECT:

Boiler Replacement Project
Seabrook Recreation Center

II. PROJECT DESCRIPTION:

A. Base Bid:

1. The project includes removal and replacement of the existing boiler. Examination of piping and repairs, as specified. Installation of replacement boiler system, as specified.

III. WORK SCHEDULE:

A. The project is to proceed at an agreed to date with Owner. The project is to be done on a continual day-to-day basis except in the case of inclement weather. The project must be completed as soon as possible. All work is to commence after an approved date from the Owner. Work must be done Monday through Friday during normal work hours.

IV. BID DUE DATE:

V.

A. All bids are due by 3:00 PM on October 10, 2019.
B. Bids must be delivered to the designated person in a timely manner to meet the bid deadline.

VI. BASE BID:

A. 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 the sums stated in the Alternate Bids.

VII. ALTERNATE BID:

None

VIII. UNIT PRICE BID:

A. As listed on bid form.

IX. CONTRACTORS:

A. Each Bidder shall include in its bid an outline of the Work to be performed by the Bidder with his own personnel. Any subcontractor work shall be identified within the Bid Proposal, and is subject to Owner approval.

B. Each bidder must provide with the Bid Form three project references with a minimum five-year history.

X. CLARIFICATIONS

A. All bidders must conduct their own measurements as the plan included with the specifications is for reference only.

B. All requests for clarification or interpretation of the Bidding Documents shall be made to Steve Caulfield, The HL Turner Group scaulfield@hlturner.com .

XI. SUBSTITUTIONS AND VOLUNTARY ALTERNATES

A. The materials, products, and equipment described in the bidding documents establish the standard of required function, dimension, appearance, and quality to be met.

B. No substitution will be considered prior to receipt of bids unless a written request for approval has been received by the aforementioned people at least three days prior to the date for receipt of bids. The Owners' decision regarding a proposed substitution shall be final.

C. If a substitution is approved prior to bidding, such approval will be set forth in an Addendum. Bidders shall not rely on approvals made in any other manner.

D. Voluntary alternates will not be accepted unless prior approval is given by the Owner or the Owner's representative. These may be rejected for any reason.

XII. PREVAILING WAGE

A. None.

XIII. BID FORM:

A. Your bid must be prepared on the Bid Form included with the Bidding Documents; additional copies may be obtained from Owner.

B. All blanks on the Bid Form must be completed in ink or type.

C. Bids by corporations must be executed in the corporate name by the President or Vice President.

D. Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

E. All names must be typed or printed below the signature.

F. The bid shall contain an acknowledgement of receipt of all Addenda (the numbers must be filled in on the Bid Form).

G. The physical and e-mail address and telephone number for communications regarding your bid must be shown.

XIV. OPENING OF BID:

A. All Bids received prior to the date and time designated for the Bid opening will be opened publicly by the Awarding Authority.

XV. BID TO REMAIN SUBJECT TO ACCEPTANCE:

A. All bids will remain subject to acceptance for 90 days after the Bid due date.

XVI. AWARD OF CONTRACT:

A. The Owner reserves the right to reject any or all Bids, if it determines that is in its interest to do so.

B. Award means the determination and selection of the lowest, responsible and eligible Bidder, by the Awarding Authority.

C. The Awarding Authority will award the contract to the lowest responsible and eligible Bidder within thirty (30) days, Saturdays, Sundays, and legal holidays excluded after the opening of bids.

D. The Awarding Authority reserves the right to waive any informalities in or to reject any or all bids if it be in the public interest to do so.

E. The Awarding Authority also reserves the right to reject any bid if it determines that such bid does not represent the bid of a person competent to perform the work as specified or if less than three (3) available bids are received.

F. The term ""lowest responsible and eligible bidder'' shall mean the Bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who obtains within ten days of the notification of contract award the security by bond, if required.

XVII. CONTRACT SECURITY:

A. When the Successful Bidder delivers the executed Agreement to owner, it must be accompanied by the required Performance and Payment Bonds. This requirement cannot be waived by Owner if the Contract Price exceeds $25,000.

II. INSURANCE:

A. When the Successful Bidder delivers the executed Agreement to the Owner, it must be accompanied by the required insurance certificates.

III. SIGNING OF AGREEMENT:

A. When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within five days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with required Bonds and insurance certificates. Owner shall deliver one fully signed counterpart to the Contractor.

IV. UNIT/ALTERNATE PRICES:

A. Prices by Corresponding Unit Are to Be Included in the Bid Form as Separate Line Items and shall be inclusive of Profit and Overhead.

V. SEALED BIDS marked “SEABROOK RECREATION CENTER BOILER PROJECT” shall be sent to:

Ms. Shaylia Marquis, Procurement Manager

Town of Seabrook

99 Lafayette Road

Seabrook, NH 03874

VI. ADDITIONAL INFORMATION:

A. If you should need any additional information or have any questions regarding the project or specifications, all questions should be submitted in writing to the attention of Steve Caulfield by email to scaulfield@hlturner.com

BID FORM

SEABROOK RECREATION CENTER
BOILER REPLACEMENT PROJECT
SEABROOK, NEW HAMPSHIRE

TO: Town of Seabrook
99 Lafayette Road
Seabrook, NH 03874

Date:_____

SUBJECT: Seabrook Recreation Center
311 Lafayette Road
Seabrook, New Hampshire

Proposal submitted by **(Bidder Name and Address Below)**:

_____

_____

The undersigned proposes to furnish all labor, material, tools and equipment in complete accordance with the provisions of the Contract Documents dated August 30, 2019 including all supplemental information provided and distributed by The H.L. Turner Group Inc.

The Bidder acknowledges receipt of and includes the requirements of the following Addenda:

Number	**Date**
_____	_____
_____	_____

In submitting this Bid, the undersigned agrees:

1. The Bidder shall not have defaulted on, or failed to execute, enter into, or perform a contract for services with the Town of Seabrook, New Hampshire during the past five (5) years.

2. The Bid shall remain in full force and will not be withdrawn for a period of thirty (30) calendar days after the actual date of Bid opening thereof.

3. To enter into and execute a contract, if awarded on the basis of this Bid.

4. To provide a Payment and Performance Bond for the contract amount.

5. To successfully accomplish the work in accordance with the Contract Documents.

6. To provide the Insurances required, as defined in the Summary of Work.

7. To **not unbalance** the Bid prices as the Town of Seabrook reserves the right to delete items in the Bid at any time.

8. The Bid prices submitted on this project shall include all material, labor, taxes, fees, permits, disposal, and all freight charges, for a total cost to the Town of Seabrook.

9. Bidder is to include with his Bid a short summary of their approach to the work, as well as any variations from the specification in a letter attached to the Bid.

10. The Town of Seabrook, New Hampshire reserves the right to accept any and all Bids and to waive any informalities.

Wastewater Treatment Plant HVAC Project:

Item	Description		Bid Price
1.	Boiler Replacement Base Bid	(L.S.)	$________________

The undersigned agrees to complete the Base Bid work for the Total Lump Sum Price of: (Base Bid includes the work shown on Drawings M0.1, M1.0, M1.2, M2.1 & M2.2).)

In words: ____

Show above amount in both words and numerals. In the event of error, amount in words shall govern.

>>

Note: The Following Items are Required as Part of the "Bid Form" Submission:

1. Bidder accepts the Town of Seabrook's general terms and conditions as outlined in the forms contained in the Project Manual.

   a. Circle One (1) of these: **Yes** **No**

   If **No** is circled, mark-up of acceptable terms must be provided with Bid.

2. Provide written short summary of the approach to the work and schedule as part of the Bid Form Submission and include the written short summary with the "Bid Form".

3. Complete the information below:

   Bidder: _____

   Business Address: _____

   _____

   Authorized Signature:_____

   Name (Print Clearly):_____

   Title: _____

MECHANICAL LEGEND

ABBREVIATION

SYMBOL	DESCRIPTION
AAV	AUTOMATIC AIR VENT
AFF	ABOVE FINISHED FLOOR
ASJ	ALL SERVICE JACKET
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CL	CENTERLINE
CV	CONSTANT VOLUME
CFM	CUBIC FEET PER MINUTE
CTE	CONNECT TO EXISTING
CW	COLD WATER
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
D	DAMPER
DB	DRY BULB TEMPERATURE, °F
Db	DECIBELS
DEG	DEGREES
DEG. F	DEGREES FAHRENHEIT
DIA	DIAMETER
DN	DOWN
DP	DEW POINT TEMPERATURE, °F
DX	DIRECT EXPANSION
E	EXISTING, EXHAUST
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EBB	ELECTRIC BASEBOARD HEATER
EC	ELECTRIC COIL, EVAPORATOR COIL
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE (INCHES WATER GAUGE)
EDB	ENTERING DRY BULB
EH	ELECTRIC HEATER
ET	EXPANSION TANK
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXIST	EXISTING
(E)	EXISTING
F	FAHRENHEIT
FC	FLEXIBLE CONNECTOR
FD	FIRE DAMPER
FLA	FULL LOAD AMPS
FN	FURNACE
FPM	FEET PER MINUTE
FSK	FOIL–SCRIM–KRAFT
FT	FEET
FT. WG	FEET WATER GAUGE
F&T	FLOAT & THERMOSTAT
FTR	FIN TUBE RADIATION
GAL	GALLON(S)
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GSR	GEOTHERMAL SOURCE RETURN
GSS	GEOTHERMAL SOURCE SUPPLY
HG	HOT GAS PIPING
HRU	HEAT RECOVERY UNIT
HRV	HEAT RECOVERY VENTILATOR
HWP	HOT WATER PUMP
HWR	HEATING WATER RETURN
HWS	HEATING WATER SUPPLY
HP	HORSE POWER
HW	HOT WATER
IN	INCHES
IN. WG	INCHES WATER GAUGE
kW	KILOWATT
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LDB	LEAVING DRY BULB
LF	LINEAR FEET
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM (15 PSI OR LESS)
LPCC	LOW PRESSURE CONDENSATE
LPCS	LOW PRESSURE CLEAN STEAM (15 PSI OR LESS)
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MD	MOTORIZED DAMPER
MIN	MINIMUM
MOCP	MAXIMUM OVER CURRENT PROTECTION
MUA	MAKE–UP AIR
Nc	NOISE CRITERIA
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NITROGEN DIOXIDE
NOM	NOMINAL
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OED	OPEN–ENDED DUCT
P	PUMP
PCF	POUNDS PER CUBIC FOOT
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
R	RETURN
RA	RETURN AIR
RH	RELATIVE HUMIDITY, REHEAT
SQ. IN.	SQUARE INCHES
TS	TEMPERATURE SENSOR
TYP	TYPICAL

APPARATUS

SYMBOL	DESCRIPTION
P	PRESSURE GAUGE – INSTALL WITH BALL VALVE
T	THERMOSTAT
TS	TEMPERATURE SENSOR
M	MOTOR
	THERMOMETER (DIAL TYPE) IN WELL
C	CARBON DIOXIDE SENSOR
P	PRESSURE SENSOR
T	TEMPERATURE SENSOR
F	FLOW SENSOR
H	HUMIDITY SENSOR
SD	DUCT SMOKE DETECTOR
M	PARALLEL BLADE MOTORIZED DAMPER
M	OPPOSED BLADE MOTORIZED DAMPER
	VOLUME DAMPER

EQUIPMENT TAGS

SHOWN IN HEXAGON BELOW REQUIRE
ELECTRICAL POWER
LOWER VALUE – EQUIPMENT TAG NUMBER
UPPER VALUE – EQUIPMENT DESIGNATION

SYMBOL	DESCRIPTION
AHU 1	AIR HANDLING UNIT
B 1	BOILER
AC 1	AIR CONDITIONING UNIT
CU 1	CONDENSING UNIT
EBB 1	ELECTRIC BASEBOARD HEATER
WH 1	WALL HEATER
ERV 1	ENERGY RECOVERY VENTILATOR
EF 1	EXHAUST FAN
FC 1	FAN COIL UNIT
FN 1	FURNACE
HRU 1	HEAT RECOVERY UNIT
HRV 1	HEAT RECOVERY VENTILATOR
MUA 1	MAKE UP AIR UNIT
P 1	PUMP

AIR DISTRIBUTION DEVICE DESIGNATION

S–1 / CFM

UPPER VALUE – DEVICE TYPE / TAG #
X = EXISTING TO BE REUSED

LOWER VALUE – AIR FLOW QUANTITY
IN CFM

SYMBOL	DESCRIPTION
T–1 CFM	TRANSFER GRILLE OR REGISTER
S–1 CFM	SUPPLY DIFFUSER 4 WAY BLOW EXCEPT WHERE INDICATED OTHERWISE
R–1 CFM	RETURN GRILLE OR REGISTER
E–1 CFM	EXHAUST GRILLE OR REGISTER
DS–1 CFM	DUCT SOX

SHEET METAL

DOUBLE–LINE CONVENTION

SYMBOL	DESCRIPTION
S	SUPPLY DUCT UP – SIZE IN INCHES (WxH)
	SUPPLY DUCT DOWN
R or E	EXHAUST OR RETURN DUCT UP
	EXHAUST OR RETURN DUCT DOWN
	OUTSIDE AIR DUCT UP
	OUTSIDE AIR DUCT DOWN
	FLEXIBLE DUCTWORK
R D	CHANGE OF ELEVATION R = RISE D = DROP
	TURNING VANES (TYP ALL MITERED ELBOWS)
	DUCT SILENCER
	FLEXIBLE CONNECTION
AD	ACCESS DOOR
	CAP DUCT
	RETURN/EXHAUST AIR FLOW DIRECTION
	SUPPLY AIR FLOW DIRECTION
	LOUVER

SINGLE–LINE CONVENTION

SYMBOL	DESCRIPTION
	CEILING SUPPLY DIFFUSER
	CEILING RETURN OR EXHAUST GRILLE
	EXHAUST OR RETURN DOWN
	EXHAUST OR RETURN UP
	SUPPLY DUCT DOWN
	SUPPLY DUCT UP
	CAP DUCT

OTHER SYMBOLS

SYMBOL	DESCRIPTION
ø	DIAMETER

FINNED TUBE RADIATION DESIGNATION

FR# / XX / X LF / X GPM

UPPER VALUE – EQUIPMENT DESIGNATION & TAG #
LOWER VALUE – MBH
VALUE BELOW – ACTIVE LENGTH OF FINNED TUBE AND GPM
ENCLOSURE. LENGTH SHALL BE AS SHOWN
OR NOTED ON THE PLANS

RETURN PIPING IN CABINET

PIPING

SYMBOL	DESCRIPTION
	ANGLE GLOBE VALVE
A	AUTOMATIC AIR VENT
	BALANCING VALVE
	BALL VALVE
	BALL VALVE WITH HOSE END
	CAPPED PIPE
C	CHEMICAL TREATMENT
	COMBINATION BALANCING, FLOW MEASURING, AND SHUT OFF VALVE (CIRCUIT SETTER)
CD	CONDENSATE DRAIN
	CONNECTION ON BOTTOM OF PIPE
	CONNECTION ON TOP OF PIPE
	DIRECTION OF FLOW
	DIRECTION OF PITCH
DW	DOMESTIC WATER
G	GAS LINE
	GATE OR BALL VALVE
	GLOBE VALVE
CWR	CHILLED WATER RETURN
CWS	CHILLED WATER SUPPLY
GR	GLYCOL RETURN
GS	GLYCOL SUPPLY
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
LPS	LOW PRESSURE STEAM
LPC	LOW PRESSURE CONDENSATE
	MANUAL AIR VENT
	NON–SLAM CHECK VALVE
	OS&Y VALVE
	PIPE ANCHOR
	PIPE DROP
	PIPE RISER
	PIPE GUIDE
A	PNEUMATIC AIR LINE
P	PRESSURE REDUCING VALVE
	PUMP
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
	REDUCER – CONCENTRIC
	REDUCER – ECCENTRIC
	SAFETY VALVE OR PRESSURE RELIEF
	SOLENOID VALVE
S	SPRING CHECK VALVE
	STRAINER (WITH 3/4" BLOW–OFF VALVE)
	SWING CHECK VALVE
	THERMOSTATIC TRAP
	THREE–WAY AUTOMATIC CONTROL VALVE (ACV) ELECTRIC OR ELECTRONIC
	TRIPLE–DUTY VALVE (COMBINATION CHECK, FLOW MEASURING, BALANCING VALVE, AND SHUT OFF)
	TWO–WAY AUTOMATIC CONTROL VALVE (ACV) ELECTRIC OR ELECTRONIC
	UNION OR FLANGE
V	VENT LINE

DRAWING LIST – MECHANICAL

NO.	TITLE
M0.1	GENERAL NOTES, ABBREVIATIONS, AND LEGEND
M1.0	MECHANICAL DEMOLITION PLAN
M1.1	BOILER ROOM PARTIAL PLAN
M2.1	SPECIFICATIONS 1 OF 2
M2.2	SPECIFICATIONS 2 OF 2

GENERAL NOTES

1. GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO DRAWINGS MARKED M.#. ABBREVIATIONS AND SYMBOLS MAY NOT BE APPLICABLE TO THIS PARTICULAR PROJECT; THEY ARE PROVIDED FOR GENERAL REFERENCE ONLY.
2. INSTALLATION SHALL MEET OR EXCEED THE CODE REQUIREMENTS OF NEW HAMPSHIRE AND LOCAL JURISDICTION REQUIREMENTS.
3. INSTALL EQUIPMENT, PIPING AND DUCTWORK AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION, AND TO FACILITATE EQUIPMENT ACCESS AS REQUIRED BY EQUIPMENT MANUFACTURER.
4. INSULATE PIPING AND DUCTWORK AS REQUIRED BY CODE.
5. PROVIDE CLAMPS, OFFSETS, EXPANSION JOINTS, ANCHORS, AND GUIDES AS NECESSARY TO PREVENT STRESS ON PIPING.
6. PLANS ARE NOT INTENDED TO SHOW EVERY DETAIL. DUCT AND PIPE LOCATIONS SHOWN ARE APPROXIMATE. DETERMINE EXACT LOCATIONS IN THE FIELD.
7. MECHANICAL CONTRACTOR SHALL COORDINATE ALL REQUIRED WALL AND ROOF OPENINGS, SIZES IN THE FIELD.
8. MECHANICAL EQUIPMENT, DUCTWORK, PIPING, ETC SHALL BE SUPPORTED FROM BUILDING SUPERSTRUCTURE. REFER TO DETAILS AND SPECIFICATIONS FOR REQUIREMENTS.
9. ALL CONNECTIONS TO NEW AND EXISTING EQUIPMENT OR SYSTEMS SHALL BE VERIFIED IN THE FIELD AND AGAINST APPROVED SUBMITTAL DRAWINGS AND SPECIFICATIONS.

TURNER GROUP

Turner Building Science & Design, LLC

26 Pinewood Lane
Harrison, Maine 04040
t:207.583.4571
turnerbuildingscience.com

ENGINEERS • BUILDING SCIENTISTS

KEY PLAN:

PROJECT TITLE / ADDRESS:

TOWN OF SEABROOK, NEW HAMPSHIRE

RECREATION CENTER BOILER REPLACEMENT

311 LAFAYETTE ROAD
SEABROOK, NH 03874

ISSUE:

PERMIT AND CONSTRUCTION 08/30/19

		STAMP
PROJ. NO.:	S1311	
SCALE:	AS NOTED	
DESN. BY:	SMC	
DRAWN BY:	SMC	
CHKD BY:	TWB	
ISSUE DATE:	08/30/19	

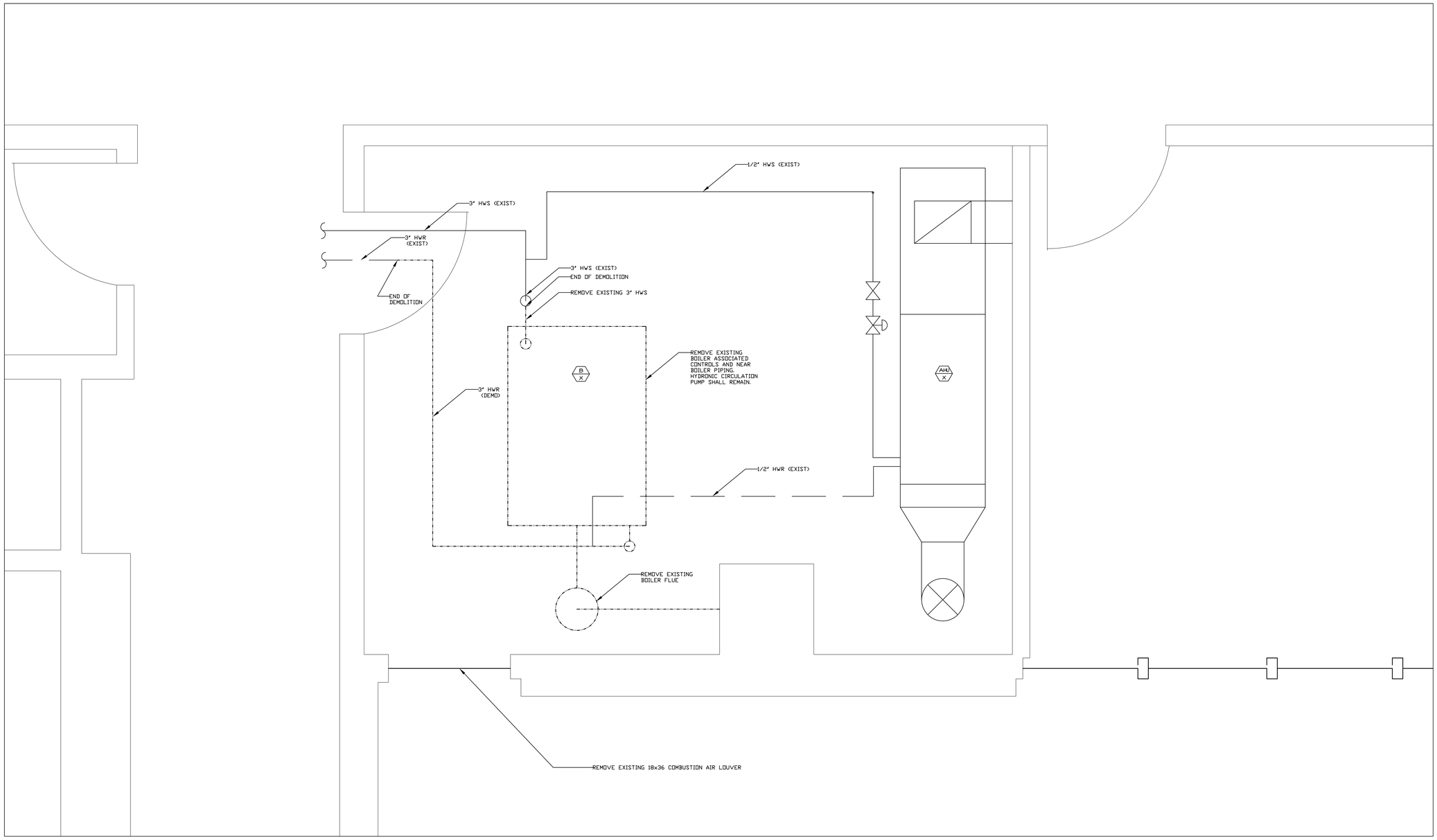
STATE OF NEW HAMPSHIRE – THOMAS W. BETTERIDGE No. 13068 LICENSED PROFESSIONAL ENGINEER

REVISIONS

SHEET TITLE:

GENERAL NOTES, ABBREVIATIONS, AND LEGEND

M0.1



1 / M1.0 MECHANICAL DEMOLITION PLAN
Scale: 1" = 1'-0"

N
NORTH

TURNER GROUP

Turner Building Science & Design, LLC

26 Pinewood Lane
Harrison, Maine 04040
t:207.583.4571
turnerbuildingscience.com

ENGINEERS • BUILDING SCIENTISTS

KEY PLAN:

PROJECT TITLE / ADDRESS:
TOWN OF SEABROOK, NEW HAMPSHIRE

RECREATION CENTER BOILER REPLACEMENT

311 LAFAYETTE ROAD
SEABROOK, NH 03874

ISSUE:
PERMIT AND CONSTRUCTION 08/30/19

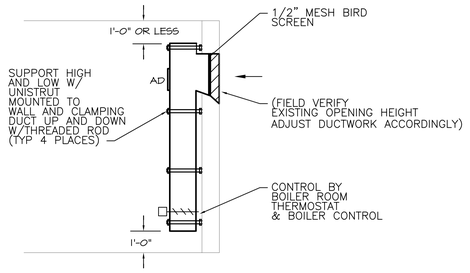
PROJ. NO.:	S1311
SCALE:	AS NOTED
DESN. BY:	SMC
DRAWN BY:	SMC
CHKD BY:	TWB
ISSUE DATE:	08/30/19

STAMP: STATE OF NEW HAMPSHIRE – THOMAS W. BETTERIDGE No. 13088 LICENSED PROFESSIONAL ENGINEER – 8/30/2019

REVISIONS

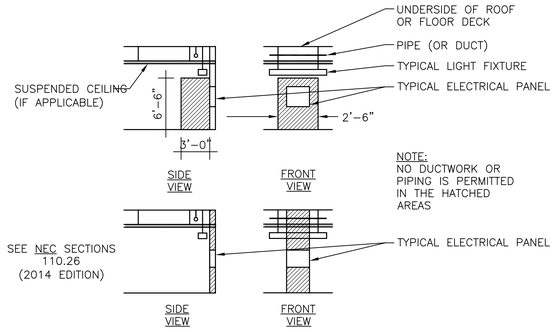
SHEET TITLE:
MECHANICAL DEMOLITION PLAN

M1.0



1 M1.1 COMBUSTION AIR DETAIL

NOT TO SCALE



2 M1.1 MIN. CLEARANCES AT ELECTRICAL PANELS

NOT TO SCALE

BOILERS - HOT WATER

DESIGNATION	LOCATION	SERVICE	OUTPUT (MBH)	WATER FLOW (GPM)	GAS INPUT (MBH)	ELECTRIC				DIMENSIONS (IN)			OPERATING WEIGHT (LBS)	CONNECTION SIZES (IN)			MANUFACTURER	LINE	MODEL	REMARKS
						VOLT	PHASE	HERTZ	HP	LENGTH	WIDTH	HEIGHT		HEATING SUPPLY	HEATING RETURN	FLUE GAS				
B-1	BOILER RM	HOT WATER	1238		1424	120	1	60	1/2	60	32	52 1/4	4555	3	3	10	HB SMITH	19HE	G19HE-10	1, 2, 3

NOTES:

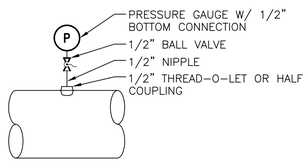
1. BOILER DESIGNED TO MATCH EXISTING LOAD.
2. PROVIDE POWERFLAME GAS BURNER MODEL JR50A WITH LOW-HIGH-LOW FIRING
3. PROVIDE HEATNET INTEGRATED BOILER MANAGEMENT SYSTEM

LOUVER SCHEDULE

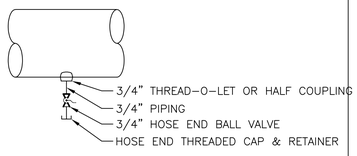
TAG	LOCATION	SERVES	TYPE	WIDTH (IN.)	HEIGHT (IN.)	DEPTH (IN.)	FREE AREA (SQ. FT)	BLADE ANGLE (DEG)	MANUFACTURER	MODEL	NOTES
L-1	BOILER ROOM	B-1	INTAKE	24	46	4	4.62	35.0	GREENHECK	ESD-435	1 - 5

NOTES:

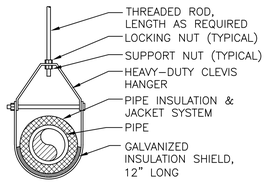
1. LOUVERS SHALL BE MADE OF EXTRUDED ALUMINUM WITH BAKED ENAMEL AAMA 2603 FINISH ON LOUVER AND ACCESSORIES IN THE AIRSTREAM. COLOR SELECTED BY OWNER.
2. LOUVER WITH DRAINABLE BLADES, 989 FPM BEGINNING POINT OF WATER ENTRY PER AMCA 511. INTERIOR BIRD SCREEN, 1/2-INCH ALUMINUM MESH.
3. PROVIDE FLANGES, ANGLES, SILLS, AND OTHER ACCESSORIES AS REQUIRED PER MANUFACTURERS INSTALLATION DETAILS AND INSTRUCTIONS.
4. MOTORIZED DAMPER IN DUCTWORK PER DETAIL.
5. FIELD-VERIFY SIZES BEFORE ORDERING.



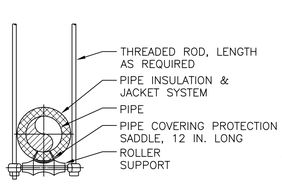
PRESSURE TAPS



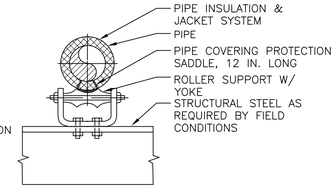
LOW POINT DRAINS



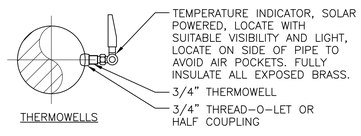
CLEVIS HANGER 3" AND SMALLER



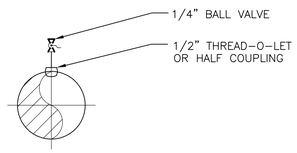
ROLLER HANGER 4" AND LARGER



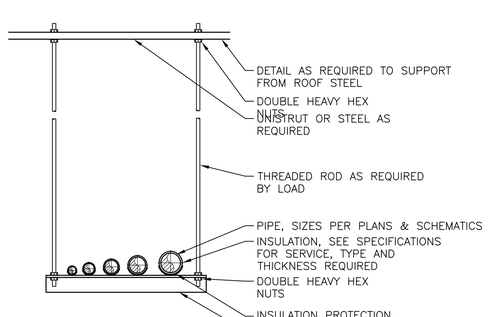
ROLLER SUPPORT 4" AND LARGER



THERMOWELLS



MANUAL AIR VENT

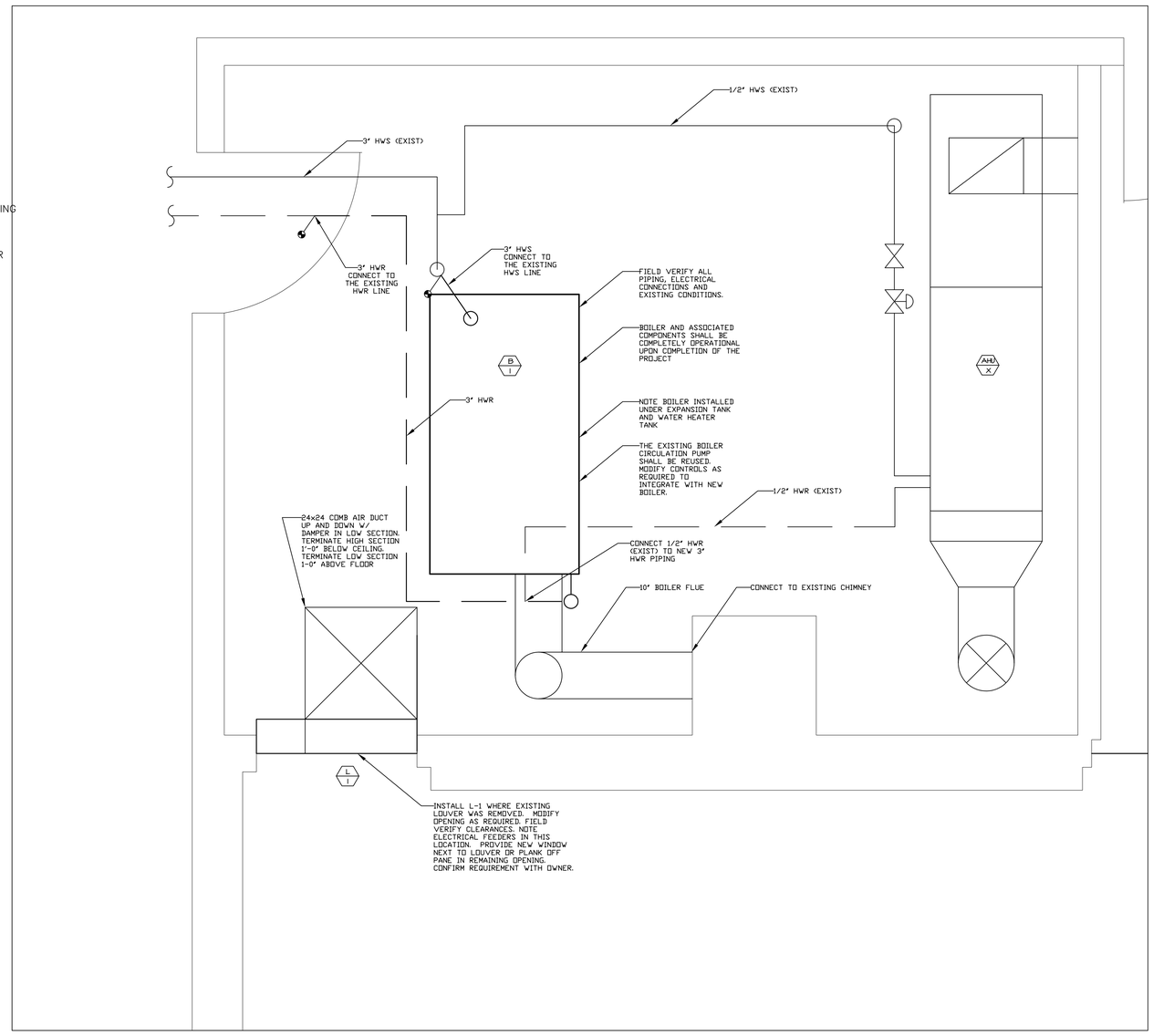


PIPE RACK

CONNECTIONS TO BUILDING STRUCTURE SHALL BE ACCORDING TO THE APPROVED BUILDING DRAWINGS. REFER TO BUILDING CONNECTION DETAILS IN THE BUILDING DRAWING CONSTRUCTION SET.

3 M1.1 TYPICAL PIPE SUPPORT & TAPPING DETAILS

NOT TO SCALE



1 M1.1 BOILER ROOM PARTIAL PLAN

Scale: 1" = 1'-0"

NORTH

TURNER GROUP

Turner Building Science & Design, LLC

26 Pinewood Lane
Harrison, Maine 04040
t:207.583.4571
turnerbuildingscience.com

ENGINEERS • BUILDING SCIENTISTS

KEY PLAN:

PROJECT TITLE / ADDRESS:

TOWN OF SEABROOK, NEW HAMPSHIRE

RECREATION CENTER BOILER REPLACEMENT

311 LAFAYETTE ROAD SEABROOK, NH 03874

ISSUE:

PERMIT AND CONSTRUCTION 08/30/19

PROJ. NO.:	S1311
SCALE:	AS NOTED
DESN. BY:	SMC
DRAWN BY:	SMC
CHKD BY:	TWB
ISSUE DATE:	08/30/19

STAMP: STATE OF NEW HAMPSHIRE - THOMAS W. BETTERIDGE No. 13088 - LICENSED PROFESSIONAL ENGINEER

REVISIONS

SHEET TITLE:

BOILER ROOM PARTIAL PLAN

M1.1

SECTION 230001 – HVAC GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 WORK INCLUDED

A. THIS SECTION SHALL INCLUDE DIVISION 01 GENERAL REQUIREMENTS.

B. WORK UNDER THIS DIVISION INCLUDES ALL SUPERVISION, LABOR, MATERIALS, TOOLS, PLANS, EQUIPMENT, TRANSPORTATION, INSURANCE, TEMPORARY PROTECTION, AND INCIDENTAL ITEMS FOR PROPER INSTALLATION AND OPERATION OF ALL SYSTEMS EVEN THOUGH NOT SPECIFICALLY MENTIONED OR INDICATED.

C. IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS TO PROVIDE FOR FINISHED SYSTEMS OF THE QUALITY SPECIFIED, PROPERLY TESTED, BALANCED AND READY FOR OPERATION. THIS INCLUDES ALL DEVICES AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE EVEN THOUGH SUCH ITEMS MAY NOT BE EXPRESSLY SHOWN OR SPECIFIED. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY AND BOTH MUST BE CONSIDERED TO DETERMINE THE FULL SCOPE OF WORK.

D. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE STRUCTURE, SYSTEMS AND OTHER CONDITIONS AFFECTING ALL THEIR WORK AND SHALL ARRANGE SUCH WORK ACCORDINGLY, FURNISHING SUCH FITTINGS AND ACCESSORIES AS MAY BE REQUIRED TO MEET SUCH CONDITIONS FOR A COMPLETE AND OPERABLE SYSTEM, AT NO ADDITIONAL COMPENSATION TO THE CONTRACTOR.

E. DRAWINGS AND SPECIFICATIONS:

1. DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY TO EACH OTHER AND WHAT IS CALLED FOR BY ONE SHALL BE AS CALLED FOR BY BOTH.

2. DO NOT SCALE DRAWINGS FOR DIMENSIONS. TAKE ALL DIMENSIONS AND MEASUREMENTS FROM THE ACTUAL FIELD CONDITIONS AND CERTIFIED DRAWINGS OF ACTUAL EQUIPMENT TO BE FURNISHED. ALL DIMENSIONS AND MEASUREMENTS MUST BE VERIFIED IN THE FIELD SINCE ACTUAL LOCATIONS, DISTANCES AND ELEVATIONS WILL BE GOVERNED BY ACTUAL FIELD CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEASUREMENTS TAKEN IN THE FIELD.

3. THE DRAWINGS ARE DIAGRAMMATIC AND ARE BASED ON THE EQUIPMENT OF ONE MANUFACTURER. THE DRAWINGS SHOULD BE FOLLOWED AS CLOSELY AS POSSIBLE, YET ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION OR ALL THE DETAILS OF THE EQUIPMENT. WHERE REQUIRED BY JOB SITE CONDITIONS, RELOCATE AND PROVIDE FITTINGS, ETC., AS REQUIRED. THE OWNER'S REPRESENTATIVE MUST APPROVE ANY DEVIATIONS FROM THE DRAWINGS.

4. IT IS INTENDED THAT ANYTHING, WHETHER LABOR OR MATERIALS, WHICH IS USUALLY FURNISHED AS PART OF ANY EQUIPMENT SPECIFIED AND WHICH IS NECESSARY FOR THE BEST OPERATION SHALL BE FURNISHED AS PART OF THE CONTRACT WITHOUT ADDITIONAL COST, WHETHER OR NOT SHOWN OR DESCRIBED.

5. STUDY AND REVIEW ALL CONTRACT DOCUMENTS.

1.2 SHOP DRAWINGS

A. SUBMIT ALL SHOP DRAWINGS AND SPECIFICATIONS OF ALL ITEMS SPECIFIED HEREIN TO THE CONSTRUCTION OWNER/MANAGER FOR APPROVAL. SUBMIT SHOP DRAWINGS AND SPECIFICATIONS IN ACCORDANCE WITH THE REQUIREMENTS DESCRIBED IN DIVISION 01. OBTAIN APPROVAL OF SHOP DRAWINGS AND SPECIFICATIONS PRIOR TO PROCEEDING WITH THE MANUFACTURE OF ITEMS THAT HAVE TO BE BUILT TO SUIT THE WORK AND PRIOR TO ORDERING STANDARD ITEMS FOR USE ON THE PROJECT.

B. REVIEW AND SUBSEQUENT APPROVAL OF SHOP DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE THIS CONTRACTOR FROM THE RESPONSIBILITY OF FURNISHING EQUIPMENT AND MATERIALS OF PROPER DIMENSION, SIZE, QUANTITY, QUALITY AND ALL PERFORMANCE CHARACTERISTIC TO EFFICIENTLY PERFORM THE REQUIREMENTS AND INTENT OF THE CONTRACT DOCUMENTS. APPROVAL SHALL NOT RELIEVE THIS CONTRACTOR FROM RESPONSIBILITY FOR ERRORS ON THE SHOP DRAWINGS

1.3 SUBSTITUTIONS

A. MATERIAL EQUIPMENT SPECIFIED SHALL BE CONSIDERED AS THE BASIS OF DESIGN. "OR EQUAL" SUBSTITUTIONS WILL BE CONSIDERED, BUT IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO SUBSTANTIATE THE QUALITY OF THE SUBSTITUTION. MATERIAL GAUGES, WEIGHTS, APPEARANCE, SOUND LEVELS GENERATED, BRAKE HORSEPOWER AND SPACE REQUIREMENTS MUST BE MET BY ANY SUBSTITUTIONS.

B. ACTION FOR SUBSTITUTIONS TO MATERIALS AND EQUIPMENT SPECIFIED HEREIN WILL BE GIVEN ONLY AFTER THE RECEIPT OF COMPLETE DATA SHOWING PERFORMANCE OVER ENTIRE RANGE, PHYSICAL DIMENSIONS AND MATERIAL CONSTRUCTION MARKED FOR THE INDIVIDUAL ITEM.

1.4 PROTECTION

A. PROTECT ALL ITEMS FROM DAMAGE DURING TRANSPORTATION AND AT THE JOBSITE; STORE AT THE SITE UNDER COVER ON LEVELED WOOD BLOCKING OR ON PALLETS. AFTER INSTALLATION, PROTECT ALL ITEMS FROM DAMAGE DURING SUBSEQUENT CONSTRUCTION ACTIVITIES. DAMAGED WORK WILL BE REJECTED AND SHALL BE REPLACED WITH NEW WORK AT NO ADDITIONAL COMPENSATION TO THE CONTRACTOR. ALL ITEMS SHALL BE SHIPPED IN CARTONS OR OTHER SUITABLE CONTAINERS. ANY ITEM THAT HAS BECOME RUSTED FROM EXPOSURE TO THE ELEMENTS WILL NOT BE PERMITTED TO BE USED.

B. THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR ALL DAMAGES OR LOSSES DUE TO ANY USE OR CAUSE.

C. ALL PIPE AND DUCT OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. ALL FIXTURES AND EQUIPMENT SHALL BE COVERED AND PROTECTED AGAINST INJURY. AT THE FINAL COMPLETION, ALL WORK SHALL BE CLEANED AND DELIVERED IN AN UNBLEMISHED CONDITION.

1.5 CODES AND STANDARDS

A. ALL STATE AND LOCAL REQUIREMENTS BY AUTHORITIES HAVING JURISDICTION SHALL APPLY.

1.6 COORDINATION

A. COORDINATE LOCATION AND INSTALLATION OF PIPING, DUCTS AND EQUIPMENT WITH ELECTRICAL, PLUMBING, STRUCTURAL, SPRINKLER AND ARCHITECTURAL PLANS AND PERFORM THE WORK IN A MANNER TO AVOID OMISSIONS AND TO ELIMINATE ANY INTERFERENCE.

1.7 MAINTENANCE MANUALS

A. PROVIDE (2) HARDCOPY SETS AND (2) ELECTRONIC SETS (PDF FORMAT ON DVD) OF THE MANUFACTURER'S OPERATING INSTRUCTIONS, SERVICE MANUALS AND PARTS CATALOGS, COVERING ALL PIECES OF EQUIPMENT AND CONTROL ITEMS

B. EACH HARDCOPY SET SHALL BE INDEXED AND NEATLY INSERTED IN A 3-RING HARD BACKED BINDER. INCLUDE A SHOP DRAWING SHOWING THE MODEL NUMBER, CAPACITY AND CHARACTERISTICS OF EACH PIECE OF EQUIPMENT INCLUDING A COMPLETE SET OF THE AUTOMATIC TEMPERATURE CONTROL SHOP DRAWINGS.

C. MANUALS SHALL INCLUDE, BUT NOT BE LIMITED TO, "APPROVED" COPIES OF SHOP DRAWINGS, "AS-BUILT" PROJECT RECORD DOCUMENTS, INSTALLATION INSTRUCTIONS, NORMAL OPERATING INSTRUCTIONS, REQUIREMENTS FOR LUBRICATION, FILTER REPLACEMENT SCHEDULE, MOTOR AND DRIVE REPLACEMENT, WATER TREATMENT RECOMMENDATIONS FOR HEATING AND COOLING SYSTEMS, PLUS SPARE PARTS LISTS, INSTRUCTIONS ON WHO TO CALL FOR SERVICE DURING WARRANTY PERIODS AND WIRING DIAGRAMS. INCLUDE NAMES, ADDRESSES AND TELEPHONE NUMBERS FOR EMERGENCY 24-HOUR SERVICE.

END OF SECTION

SECTION 230553 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. NAMEPLATES.
B. TAGS.
C. STENCILS.
D. PIPE MARKERS.

1.02 REFERENCE STANDARDS
A. ASME A13.1 – SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2007.
B. ASTM D709 – STANDARD SPECIFICATION FOR LAMINATED THERMOSETTING MATERIALS; 2001 (REAPPROVED 2007).

1.03 SUBMITTALS
A. CHART AND SCHEDULE: SUBMIT VALVE CHART AND SCHEDULE, INCLUDING VALVE TAG NUMBER, LOCATION, FUNCTION, AND VALVE MANUFACTURER'S NAME AND MODEL NUMBER.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS
A. PIPING: PIPE MARKERS.
B. PUMPS: NAMEPLATES.
C. TANKS: NAMEPLATES.

2.02 NAMEPLATES
A. MANUFACTURERS:
1. ADVANCED GRAPHIC ENGRAVING: WWW.ADVANCEDGRAPHICENGRAVING.COM.
2. LETTER COLOR: WHITE.
3. LETTER HEIGHT: 1/2 INCH.
4. BACKGROUND COLOR: BLACK.
5. PLASTIC: CONFORM TO ASTM D709.

2.03 TAGS
A. MANUFACTURERS:
1. ADVANCED GRAPHIC ENGRAVING: WWW.ADVANCEDGRAPHICENGRAVING.COM.
2. BRADY CORPORATION: WWW.BRADYCORP.COM.
3. KOLBI PIPE MARKER CO.: WWW.KOLBIPIPEMARKERS.COM.
4. SETON IDENTIFICATION PRODUCTS: WWW.SETON.COM.
B. METAL TAGS: BRASS WITH STAMPED LETTERS; TAG SIZE MINIMUM 1-1/2 INCH DIAMETER WITH SMOOTH EDGES.
C. VALVE TAG CHART: TYPEWRITTEN LETTER SIZE LIST IN ANODIZED ALUMINUM FRAME.

2.04 STENCILS
A. MANUFACTURERS:
1. BRADY CORPORATION
2. KOLBI PIPE MARKER CO.
3. SETON IDENTIFICATION PRODUCTS.
B. STENCILS: WITH CLEAN CUT SYMBOLS AND LETTERS OF FOLLOWING SIZE:
1. 3/4 TO 1-1/4 INCH OUTSIDE DIAMETER OF INSULATION OR PIPE: 8 INCH LONG COLOR FIELD, 1/2 INCH HIGH LETTERS.
2. 1-1/2 TO 2 INCH OUTSIDE DIAMETER OF INSULATION OR PIPE: 8 INCH LONG COLOR FIELD, 3/4 INCH HIGH LETTERS.
3. 2-1/2 TO 6 INCH OUTSIDE DIAMETER OF INSULATION OR PIPE: 12 INCH LONG COLOR FIELD, 1-1/4 INCH HIGH LETTERS.

2.05 PIPE MARKERS
A. MANUFACTURERS:
1. BRADY CORPORATION.
2. KOLBI PIPE MARKER CO.
3. MIFAB, INC.
4. SETON IDENTIFICATION PRODUCTS.
B. PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, SEMI-RIGID PLASTIC, PREFORMED TO FIT AROUND PIPE OR PIPE COVERING; MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.
C. PLASTIC TAPE PIPE MARKERS: FLEXIBLE, VINYL FILM TAPE WITH PRESSURE SENSITIVE ADHESIVE BACKING AND PRINTED MARKINGS.

PART 3 EXECUTION

3.01 PREPARATION
A. DEGREASE AND CLEAN SURFACES TO RECEIVE ADHESIVE FOR IDENTIFICATION MATERIALS.

3.02 INSTALLATION
A. INSTALL NAMEPLATES WITH CORROSIVE-RESISTANT MECHANICAL FASTENERS, OR ADHESIVE. APPLY WITH SUFFICIENT ADHESIVE TO ENSURE PERMANENT ADHESION AND SEAL WITH CLEAR LACQUER.
B. INSTALL TAGS WITH CORROSION RESISTANT CHAIN.
C. INSTALL PLASTIC PIPE MARKERS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
D. INSTALL PLASTIC TAPE PIPE MARKERS COMPLETE AROUND PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

END OF SECTION

SECTION 230713 DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. DUCT INSULATION.

1.02 RELATED REQUIREMENTS
A. SECTION 230553 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT.

1.03 REFERENCE STANDARDS
A. ASTM C518 – STANDARD TEST METHOD FOR STEADY-STATE THERMAL TRANSMISSION PROPERTIES BY MEANS OF THE HEAT FLOW METER APPARATUS; 2010.
B. ASTM C553 – SPECIFICATION FOR MINERAL FIBER BLANKET THERMAL INSULATION FOR COMMERCIAL AND INDUSTRIAL APPLICATIONS; 2008.
C. ASTM C612 – STANDARD SPECIFICATION FOR MINERAL FIBER BLOCK AND BOARD THERMAL INSULATION; 2010.
D. ASTM C916 – STANDARD SPECIFICATION FOR ADHESIVES FOR DUCT THERMAL INSULATION; 1985 (REAPPROVED 2007).
E. ASTM C1338 – STANDARD TEST METHOD FOR DETERMINING FUNGI RESISTANCE OF INSULATION MATERIALS AND FACINGS; 2008.
F. ASTM E84 – STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; 2010B.
G. ASTM G21 – STANDARD PRACTICE FOR DETERMINING RESISTANCE OF SYNTHETIC POLYMERIC MATERIALS TO FUNGI; 2009.
H. NFPA 255 – STANDARD METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; NATIONAL FIRE PROTECTION ASSOCIATION; 2006.
I. SMACNA (DCS) – HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE; SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION; 2005.

1.04 SUBMITTALS
A. PRODUCT DATA: PROVIDE PRODUCT DESCRIPTION, THERMAL CHARACTERISTICS, LIST OF MATERIALS AND THICKNESS FOR EACH SERVICE, AND LOCATIONS.

1.05 DELIVERY, STORAGE, AND HANDLING
A. ACCEPT MATERIALS ON SITE IN ORIGINAL FACTORY PACKAGING, LABELLED WITH MANUFACTURER'S IDENTIFICATION, INCLUDING PRODUCT DENSITY AND THICKNESS.
B. PROTECT INSULATION FROM WEATHER AND CONSTRUCTION TRAFFIC, DIRT, WATER, CHEMICAL, AND MECHANICAL DAMAGE, BY STORING IN ORIGINAL WRAPPING.

PART 2 PRODUCTS

2.01 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION
A. SURFACE BURNING CHARACTERISTICS: FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/50, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E84, NFPA 255, OR UL 723.

2.02 GLASS FIBER, RIGID
A. MANUFACTURER:
1. KNAUF INSULATION: WWW.KNAUFUSA.COM.
2. JOHNS MANVILLE CORPORATION: WWW.JM.COM.
3. OWENS CORNING CORP: WWW.OWENSCORNING.COM.
4. CERTAINTEED CORPORATION: WWW.CERTAINTEED.COM.
B. INSULATION: ASTM C612; RIGID, NONCOMBUSTIBLE BLANKET INSULATION.
1. 'K' VALUE: 0.24 AT 75 DEGREES F, WHEN TESTED IN ACCORDANCE WITH ASTM C518. 1-1/2" THICK FOR A MINIMUM OF R-5.
C. VAPOR BARRIER JACKET:
1. KRAFT PAPER WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM.
2. SECURE WITH PRESSURE SENSITIVE TAPE.
D. VAPOR BARRIER TAPE:
1. KRAFT PAPER REINFORCED WITH GLASS FIBER YARN AND BONDED TO ALUMINIZED FILM, WITH PRESSURE SENSITIVE RUBBER BASED ADHESIVE.

PART 3 EXECUTION

3.01 EXAMINATION
A. VERIFY THAT DUCTS HAVE BEEN TESTED BEFORE APPLYING INSULATION MATERIALS.
B. VERIFY THAT SURFACES ARE CLEAN, FOREIGN MATERIAL REMOVED, AND DRY.

3.02 INSTALLATION
A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
B. INSTALL IN ACCORDANCE WITH NAIMA NATIONAL INSULATION STANDARDS.
C. INSULATED DUCTS CONVEYING AIR BELOW AMBIENT TEMPERATURE:
1. PROVIDE INSULATION WITH VAPOR BARRIER JACKETS.
2. FINISH WITH TAPE AND VAPOR BARRIER JACKET.
3. CONTINUE INSULATION THROUGH WALLS, SLEEVES, HANGERS, AND OTHER DUCT PENETRATIONS.

END OF SECTION

SECTION 230719 HVAC PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. PIPING INSULATION.
B. JACKETS AND ACCESSORIES.

1.02 RELATED REQUIREMENTS
A. SECTION 232113 – HYDRONIC PIPING: PLACEMENT OF HANGERS AND HANGER INSERTS.

1.03 REFERENCE STANDARDS
A. ASTM C177 – STANDARD TEST METHOD FOR STEADY-STATE HEAT FLUX MEASUREMENTS AND THERMAL TRANSMISSION PROPERTIES BY MEANS OF THE GUARDED HOT PLATE APPARATUS; 2010.
B. ASTM C518 – STANDARD TEST METHOD FOR STEADY-STATE THERMAL TRANSMISSION PROPERTIES BY MEANS OF THE HEAT FLOW METER APPARATUS; 2010.
C. ASTM C534/C534M – STANDARD SPECIFICATION FOR PREFORMED FLEXIBLE ELASTOMERIC CELLULAR THERMAL INSULATION IN SHEET AND TUBULAR FORM; 2008.
D. ASTM C547 – STANDARD SPECIFICATION FOR MINERAL FIBER PIPE INSULATION; 2007E1.
E. ASTM C585 – STANDARD PRACTICE FOR INNER AND OUTER DIAMETERS OF RIGID THERMAL INSULATION FOR NOMINAL SIZES OF PIPE AND TUBING (NPS SYSTEM); 2010.
F. ASTM D2842 – STANDARD TEST METHOD FOR WATER ABSORPTION OF RIGID CELLULAR PLASTICS; 2006.
G. ASTM E84 – STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; 2010B.
H. ASTM E96/E96M – STANDARD TEST METHODS FOR WATER VAPOR TRANSMISSION OF MATERIALS; 2010.
I. NFPA 255 – STANDARD METHOD OF TEST OF SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; NATIONAL FIRE PROTECTION ASSOCIATION; 2006.
J. UL 723 – STANDARD FOR TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; UNDERWRITERS LABORATORIES INC.; CURRENT EDITION, INCLUDING ALL REVISIONS.

1.04 SUBMITTALS
A. SEE SECTION 013000 – ADMINISTRATIVE REQUIREMENTS, FOR SUBMITTAL PROCEDURES.
B. PRODUCT DATA: PROVIDE PRODUCT DESCRIPTION, THERMAL CHARACTERISTICS, LIST OF MATERIALS AND THICKNESS FOR EACH SERVICE, AND LOCATIONS.

1.05 DELIVERY, STORAGE, AND HANDLING
A. ACCEPT MATERIALS ON SITE, LABELED WITH MANUFACTURER'S IDENTIFICATION, PRODUCT DENSITY, AND THICKNESS.

PART 2 PRODUCTS

2.01 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION
A. SURFACE BURNING CHARACTERISTICS: FLAME SPREAD/SMOKE DEVELOPED INDEX OF 25/50, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E84, NFPA 255, OR UL 723.

2.02 GLASS FIBER
A. MANUFACTURERS:
1. KNAUF INSULATION: WWW.KNAUFUSA.COM.
2. JOHNS MANVILLE CORPORATION: WWW.JM.COM.
3. OWENS CORNING CORP: WWW.OWENSCORNING.COM.
4. CERTAINTEED CORPORATION: WWW.CERTAINTEED.COM.
B. INSULATION: ASTM C547 AND ASTM C795; RIGID MOLDED, NONCOMBUSTIBLE.
1. 'K' VALUE: ASTM C177, 0.24 AT 75 DEGREES F.
2. MAXIMUM SERVICE TEMPERATURE: 850 DEGREES F.
3. MAXIMUM MOISTURE ABSORPTION: 0.2 PERCENT BY VOLUME.
C. VAPOR BARRIER JACKET: WHITE KRAFT PAPER WITH GLASS FIBER YARN, BONDED TO ALUMINIZED FILM; MOISTURE VAPOR TRANSMISSION WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M OF 0.02 PERM-INCHES.
D. TIE WIRE: 0.048 INCH STAINLESS STEEL WITH TWISTED ENDS ON MAXIMUM 12 INCH CENTERS.

2.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION
A. INSULATION: PREFORMED FLEXIBLE ELASTOMERIC CELLULAR RUBBER INSULATION COMPLYING WITH ASTM C534 GRADE 3; USE MOLDED TUBULAR MATERIAL WHEREVER POSSIBLE.
1. MINIMUM SERVICE TEMPERATURE: -40 DEGREES F.
2. MAXIMUM SERVICE TEMPERATURE: 220 DEGREES F.
3. CONNECTION: WATERPROOF VAPOR BARRIER ADHESIVE.

2.05 JACKETS
A. PVC PLASTIC.
1. JACKET: ONE PIECE MOLDED TYPE FITTING COVERS AND SHEET MATERIAL, OFF-WHITE COLOR.
a. MINIMUM SERVICE TEMPERATURE: 0 DEGREES F.
b. MAXIMUM SERVICE TEMPERATURE: 150 DEGREES F.
c. MOISTURE VAPOR PERMEABILITY: 0.002 PERM INCH, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M.
d. THICKNESS: 10 MIL.
e. CONNECTIONS: BRUSH ON WELDING ADHESIVE.

PART 3 EXECUTION

3.01 INSTALLATION
A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
B. INSTALL IN ACCORDANCE WITH NAIMA NATIONAL INSULATION STANDARDS.
C. EXPOSED PIPING: LOCATE INSULATION AND COVER SEAMS IN LEAST VISIBLE LOCATIONS.
D. GLASS FIBER INSULATED PIPES CONVEYING FLUIDS BELOW AMBIENT TEMPERATURE:
1. PROVIDE VAPOR BARRIER JACKETS, FACTORY-APPLIED OR FIELD-APPLIED. SECURE WITH SELF-SEALING LONGITUDINAL LAPS AND BUTT STRIPS WITH PRESSURE SENSITIVE ADHESIVE. SECURE WITH OUTWARD CLINCH EXPANDING STAPLES AND VAPOR BARRIER MASTIC.
2. INSULATE FITTINGS, JOINTS, AND VALVES WITH MOLDED INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJACENT PIPE. FINISH WITH GLASS CLOTH AND VAPOR BARRIER ADHESIVE OR PVC FITTING COVERS.
E. INSERTS AND SHIELDS:
1. APPLICATION: PIPING 1-1/2 INCHES 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 6 INCHES LONG, OF SAME THICKNESS AND CONTOUR AS ADJOINING INSULATION; MAY BE FACTORY FABRICATED.
5. INSERT MATERIAL: HYDROUS CALCIUM SILICATE INSULATION OR OTHER HEAVY DENSITY INSULATING MATERIAL SUITABLE FOR THE PLANNED TEMPERATURE RANGE.
F. CONTINUE INSULATION THROUGH WALLS, SLEEVES, PIPE HANGERS, AND OTHER PIPE PENETRATIONS. FINISH AT SUPPORTS, PROTRUSIONS, AND INTERRUPTIONS. AT FIRE SEPARATIONS, REFER TO SECTION 078400.
G. PIPE EXPOSED IN MECHANICAL EQUIPMENT ROOMS OR FINISHED SPACES (LESS THAN 10 FEET ABOVE FINISHED FLOOR): FINISH WITH PVC JACKET AND FITTING COVERS.
H. 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 ALUMINUM JACKET WITH SEAMS LOCATED ON BOTTOM SIDE OF HORIZONTAL PIPING. PROVIDE TWO COATS OF UV RESISTANT FINISH FOR FLEXIBLE ELASTOMERIC CELLULAR INSULATION WITHOUT JACKETING.

3.02 SCHEDULE SEE TABLE 1

TABLE 1 PIPING INSULATION WALL THICKNESSES SHALL BE AS FOLLOWS

OPERATING TEMPERATURE RANGE (F)	CONDUCTIVITY (BTU-IN./HR-FT3-F)	RATING TEMP (F)	NOMINAL PIPE DIAMETER (IN.)				
			RUNOUTS UP TO 2	≤ 1	1 – 1 1/2	1 1/2 – 4	4 – 8
HEATING SYSTEMS (HOT WATER AND GLYCOL)							
141–200	0.25–0.29	125	0.5	1.5	1.5	2.0	2.0
105–140	0.24–0.28	100	0.5	1.5	1.5	2.0	2.0

NOTES:
1. A "RUNOUT" IS DEFINED AS THE SHORT RUN OF PIPE FROM THE BRANCH PIPING ABOVE OR AT THE CEILING TYPICALLY, ALONG A WALL OR PARTITION, AND THE DROP IN OR ALONG A WALL OR PARTITION TO A TERMINAL DEVICE. NOT TO EXCEED 4 FT IN HORIZONTAL LENGTH.

END OF SECTION

SECTION 230993 SEQUENCE OF OPERATIONS FOR HVAC CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. THIS SECTION DEFINES THE MANNER AND METHOD BY WHICH CONTROLS FUNCTION. REQUIREMENTS FOR EACH TYPE OF CONTROL SYSTEM OPERATION ARE SPECIFIED. EQUIPMENT, DEVICES, AND SYSTEM COMPONENTS REQUIRED FOR CONTROL SYSTEMS ARE SPECIFIED IN OTHER SECTIONS.
B. SEQUENCE OF OPERATION FOR:
1. HEATING WATER ZONE CONTROL.

1.02 SUBMITTALS
A. SEQUENCE OF OPERATION DOCUMENTATION: SUBMIT WRITTEN SEQUENCE OF OPERATION FOR ENTIRE HVAC SYSTEM AND EACH PIECE OF EQUIPMENT.
1. INCLUDE AT LEAST THE FOLLOWING SEQUENCES:
a. START-UP.
b. WARM-UP MODE.
c. NORMAL OPERATING MODE.
d. UNOCCUPIED MODE.
e. SHUTDOWN.
f. TEMPERATURE AND PRESSURE CONTROL, SUCH AS SETBACKS, SETUPS, RESETS, ETC.
g. DETAILED SEQUENCES FOR ALL CONTROL STRATEGIES, SUCH AS ECONOMIZER CONTROL, OPTIMUM START/STOP, STAGING, OPTIMIZATION, DEMAND LIMITING, ETC.
h. EFFECTS OF POWER OR EQUIPMENT FAILURE WITH ALL STANDBY COMPONENT FUNCTIONS.
i. SEQUENCES FOR ALL ALARMS AND EMERGENCY SHUT DOWNS.
j. INTERACTIONS AND INTERLOCKS WITH OTHER SYSTEMS.
2. INCLUDE INITIAL AND RECOMMENDED VALUES FOR ALL ADJUSTABLE SETTINGS, SETPOINTS AND PARAMETERS THAT ARE TYPICALLY SET OR ADJUSTED BY OPERATING STAFF; AND ANY OTHER CONTROL SETTINGS OR FIXED VALUES, DELAYS, ETC. THAT WILL BE USEFUL DURING TESTING AND OPERATING THE EQUIPMENT.
3. FOR PACKAGED CONTROLLED EQUIPMENT, INCLUDE MANUFACTURER'S FURNISHED SEQUENCE OF OPERATION AMPLIFIED AS REQUIRED TO DESCRIBE THE RELATIONSHIP BETWEEN THE PACKAGED CONTROLS AND THE CONTROL SYSTEM, INDICATING WHICH POINTS ARE ADJUSTABLE CONTROL POINTS AND WHICH POINTS ARE ONLY MONITORED.
B. CONTROL SYSTEM DIAGRAMS: SUBMIT GRAPHIC SCHEMATIC OF THE CONTROL SYSTEM SHOWING EACH CONTROL COMPONENT AND EACH COMPONENT CONTROLLED, MONITORED, OR ENABLED.
1. LABEL WITH SETTINGS, ADJUSTABLE RANGE OF CONTROL AND LIMITS.
2. INCLUDE DRAFT COPIES OF GRAPHIC DISPLAYS INDICATING MECHANICAL SYSTEM COMPONENTS, CONTROL SYSTEM COMPONENTS, AND CONTROLLED FUNCTION STATUS AND VALUE.
3. INCLUDE ALL MONITORING, CONTROL AND VIRTUAL POINTS SPECIFIED IN ELSEWHERE.
4. INCLUDE A KEY TO ALL ABBREVIATIONS.
C. POINTS LIST: SUBMIT LIST OF ALL CONTROL POINTS INDICATING AT LEAST THE FOLLOWING FOR EACH POINT.
1. NAME OF CONTROLLED SYSTEM.
2. POINT ABBREVIATION.
3. POINT DESCRIPTION; SUCH AS DRY BULB TEMPERATURE, AIRFLOW, ETC.
4. DISPLAY UNIT.
5. CONTROL POINT OR SETPOINT (YES / NO); I.E. A POINT THAT CONTROLS EQUIPMENT AND CAN HAVE ITS SETPOINT CHANGED.
6. MONITORING POINT (YES / NO); I.E. A POINT THAT DOES NOT CONTROL OR CONTRIBUTE TO THE CONTROL OF EQUIPMENT BUT IS USED FOR OPERATION, MAINTENANCE, OR PERFORMANCE VERIFICATION.
7. INTERMEDIATE POINT (YES / NO); I.E. A POINT WHOSE VALUE IS USED TO MAKE A CALCULATION WHICH THEN CONTROLS EQUIPMENT, SUCH AS SPACE TEMPERATURES THAT ARE AVERAGED TO A VIRTUAL POINT TO CONTROL RESET.
8. CALCULATED POINT (YES / NO); I.E. A "VIRTUAL" POINT GENERATED FROM CALCULATIONS OF OTHER POINT VALUES.
D. PROJECT RECORD DOCUMENTS: RECORD ACTUAL LOCATIONS OF COMPONENTS AND SETPOINTS OF CONTROLS, INCLUDING CHANGES TO SEQUENCES MADE AFTER SUBMISSION OF SHOP DRAWINGS.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.01 HEATING WATER ZONE CONTROL
A. WHENEVER THE OUTDOOR AIR DROPS BELOW 60°F (ADJUSTABLE), BOILER ROOM MAIN BUILDING CIRCULATOR PUMP P-1 SHALL BE ENABLED TO RUN CONTINUOUSLY AND BOILER B-1 SHALL BE ENABLED.
B. TWO-POSITION DAMPER ON COMBUSTION AIR SYSTEM SHALL OPEN WHEN BOILER B-1 BEGINS PURGE CYCLE. DAMPER SHALL PROVE OPEN (VIA END SWITCH) PRIOR TO BURNER IN B-1 FIRING. DAMPER SHALL ALSO OPEN IF BOILER ROOM TEMPERATURE RISES ABOVE SETPOINT.
B. HEATING WATER RESET:
1. WHEN B-1 IS ENABLED, THE BOILER SHALL MAINTAIN THE HOT WATER SUPPLY SETPOINT TEMPERATURE, ACCORDING TO THE FOLLOWING RESET SCHEDULE.

THE RESET CONTROLS SHALL HAVE AN ADJUSTABLE RESET SCHEDULE SET AT 140°F AT 40°F OAT AND 180°F AT 0°F OAT.
C. PROVIDE ALARM TO THE DDC SYSTEM IF BOILER FAILURE OCCURS.

END OF SECTION

SECTION 232113 HYDRONIC PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. PIPE AND PIPE FITTINGS FOR:
1. HEATING WATER PIPING SYSTEM.
2. EQUIPMENT DRAINS AND OVERFLOWS.
B. VALVES:
1. GLOBE OR ANGLE VALVES.
2. BALL VALVES.

1.02 RELATED REQUIREMENTS
A. SECTION 230719 – HVAC PIPING INSULATION.
B. SECTION 232114 – HYDRONIC SPECIALTIES.
C. SECTION 232500 – HVAC WATER TREATMENT: PIPE CLEANING.

1.03 REFERENCE STANDARDS
A. ASME (BPV IX) – BOILER AND PRESSURE VESSEL CODE, SECTION IX – WELDING AND BRAZING QUALIFICATIONS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2010.
B. ASME B16.3 – MALLEABLE IRON THREADED FITTINGS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 1998 (R2006).
C. ASME B16.18 – CAST COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2001 (R2005) (ANSI B16.18).
D. ASME B16.22 – WROUGHT COPPER AND COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2001 (R2005).
E. ASME B31.9 – BUILDING SERVICES PIPING; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2008 (ANSI/ASME B31.9).
F. ASTM A53/A53M – STANDARD SPECIFICATION FOR PIPE, STEEL, BLACK AND HOT-DIPPED, ZINC-COATED, WELDED AND SEAMLESS; 2010.
G. ASTM A234/A234M – STANDARD SPECIFICATION FOR PIPING FITTINGS OF WROUGHT CARBON STEEL AND ALLOY STEEL FOR MODERATE AND HIGH TEMPERATURE SERVICE; 2011.
H. ASTM B32 – STANDARD SPECIFICATION FOR SOLDER METAL; 2008.
I. ASTM B88 – STANDARD SPECIFICATION FOR SEAMLESS COPPER WATER TUBE; 2009.
J. ASTM B88M – STANDARD SPECIFICATION FOR SEAMLESS COPPER WATER TUBE (METRIC); 2005.
K. P. AWS A5.8/A5.8M – SPECIFICATION FOR FILLER METALS FOR BRAZING AND BRAZE WELDING; AMERICAN WELDING SOCIETY; 2004 AND ERRATA.
Q. MSS SP-58 – PIPE HANGERS AND SUPPORTS – MATERIALS, DESIGN AND MANUFACTURE, SELECTION, APPLICATION, AND INSTALLATION; MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY, INC.; 2009.

1.04 SUBMITTALS
A. PRODUCT DATA: INCLUDE DATA ON PIPE MATERIALS, PIPE FITTINGS, VALVES, AND ACCESSORIES. PROVIDE MANUFACTURERS CATALOGUE INFORMATION. INDICATE VALVE DATA AND RATINGS.
B. WELDERS CERTIFICATE: INCLUDE WELDERS CERTIFICATION OF COMPLIANCE WITH ASME (BPV IX).
C. MANUFACTURER'S INSTALLATION INSTRUCTIONS: INDICATE HANGING AND SUPPORT METHODS, JOINING PROCEDURES.

PART 2 PRODUCTS

2.01 HYDRONIC SYSTEM REQUIREMENTS
A. COMPLY WITH ASME B31.9 AND APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
B. PIPING: PROVIDE PIPING, FITTINGS, HANGERS AND SUPPORTS AS REQUIRED, AS INDICATED, AND AS FOLLOWS:
1. WHERE MORE THAN ONE PIPING SYSTEM MATERIAL IS SPECIFIED, PROVIDE JOINING FITTINGS THAT ARE COMPATIBLE WITH PIPING MATERIALS AND ENSURE THAT THE INTEGRITY OF THE SYSTEM IS NOT JEOPARDIZED.
2. USE NON-CONDUCTING DIELECTRIC CONNECTIONS WHENEVER JOINTING DISSIMILAR METALS.
3. PROVIDE PIPE HANGERS AND SUPPORTS IN ACCORDANCE WITH ASME B31.9 UNLESS INDICATED OTHERWISE.
C. PIPE-TO-VALVE AND PIPE-TO-EQUIPMENT CONNECTIONS: USE FLANGES, UNIONS, OR GROOVED COUPLINGS TO ALLOW DISCONNECTION OF COMPONENTS FOR SERVICING; DO NOT USE DIRECT WELDED, SOLDERED, OR THREADED CONNECTIONS.
D. VALVES: PROVIDE VALVES WHERE INDICATED AND AS FOLLOWS:
1. PROVIDE DRAIN VALVES WHERE INDICATED, AND IF NOT INDICATED PROVIDE AT LEAST AT MAIN SHUT-OFF, LOW POINTS OF PIPING, BASES OF VERTICAL RISERS, AND AT EQUIPMENT. USE 3/4 INCH BALL VALVES WITH CAP; PIPE TO NEAREST FLOOR DRAIN.
2. FOR THROTTLING, BYPASS, OR MANUAL FLOW CONTROL SERVICES, USE GLOBE OR BALL VALVES.
3. FOR SHUT-OFF AND TO ISOLATE PARTS OF SYSTEMS OR VERTICAL RISERS, USE BALL VALVES.

2.02 HEATING WATER PIPING, ABOVE GROUND
A. STEEL PIPE: ASTM A53/A53M, SCHEDULE 40, BLACK, USING ONE OF THE FOLLOWING JOINT TYPES:
1. WELDED JOINTS: ASTM A234/A234M, WROUGHT STEEL WELDING TYPE FITTINGS; AWS D1.1 WELDED.
2. THREADED JOINTS: ASTM B16.3, MALLEABLE IRON FITTINGS.
B. COPPER TUBE: ASTM B88 (ASTM B88M), TYPE K (A), DRAWN, USING ONE OF THE FOLLOWING JOINT TYPES:
1. SOLDER JOINTS: ASME B16.18 CAST BRASS/BRONZE OR ASME B16.22 SOLDER WROUGHT COPPER FITTINGS.
a. SOLDER: ASTM B32 LEAD-FREE SOLDER, HB ALLOY (95-5 TIN-ANTIMONY) OR TIN AND SILVER.
b. BRAZE: AWS A5.8/A5.8M BCUP COPPER/SILVER ALLOY.
2. TEE CONNECTIONS: MECHANICALLY EXTRACTED COLLARS WITH NOTCHED AND DIMPLED BRANCH TUBE.

2.03 EQUIPMENT DRAINS AND OVERFLOWS
A. COPPER TUBE: ASTM B88 (ASTM B88M), TYPE K (A), DRAWN; USING ONE OF THE FOLLOWING JOINT TYPES:
1. SOLDER JOINTS: ASME B16.18 CAST BRASS/BRONZE OR ASME B16.22 SOLDER WROUGHT COPPER FITTINGS; ASTM B32 LEAD-FREE SOLDER, HB ALLOY (95-5 TIN-ANTIMONY) OR TIN AND SILVER.
2. TYPE L COPPER IS ALSO ACCEPTABLE FOR HYDRONIC PIPING.

2.04 PIPE HANGERS AND SUPPORTS
A. PROVIDE HANGERS AND SUPPORTS THAT COMPLY WITH MSS SP-58.
1. IF TYPE OF HANGER OR SUPPORT FOR A PARTICULAR SITUATION IS NOT INDICATED, SELECT APPROPRIATE TYPE USING MSS SP-58 RECOMMENDATIONS.
B. HANGERS FOR PIPE SIZES 1/2 TO 1-1/2 INCH: MALLEABLE IRON, ADJUSTABLE SWIVEL, SPLIT RING.
C. HANGERS FOR HOT PIPE SIZES 2 TO 4 INCHES: CARBON STEEL, ADJUSTABLE, CLEVIS.
D. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS.
E. WALL SUPPORT FOR PIPE SIZES TO 3 INCHES: CAST IRON HOOK.
F. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP.
G. VERTICAL SUPPORT: STEEL RISER CLAMP.
H. FLOOR SUPPORT FOR HOT PIPE SIZES TO 4 INCHES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCK NUT, NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
I. COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
J. HANGER RODS: MILD STEEL THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED.

2.05 UNIONS, FLANGES, AND COUPLINGS
A. UNIONS FOR PIPE 2 INCHES AND UNDER:
1. FERROUS PIPING: 150 PSIG MALLEABLE IRON, THREADED.
2. COPPER PIPE: BRONZE, SOLDERED JOINTS.
B. FLANGES FOR PIPE OVER 2 INCHES:
1. FERROUS PIPING: 150 PSIG FORGED STEEL, SLIP-ON.
C. DIELECTRIC CONNECTIONS: UNION OR WATERWAY FITTING WITH WATER IMPERVIOUS ISOLATION BARRIER AND ONE GALVANIZED OR PLATED STEEL END AND ONE COPPER TUBE END, END TYPES TO MATCH PIPE JOINT TYPES USED.

2.06 GATE VALVES
A. OVER 2 INCHES:
1. IRON BODY, BRONZE TRIM, BOLTED BONNET, RISING STEM, HANDWHEEL, OUTSIDE SCREW AND YOKE, SOLID WEDGE DISC WITH BRONZE SEAT RINGS, FLANGED ENDS.

2.07 GLOBE OR ANGLE VALVES
A. OVER 2 INCHES:
1. IRON BODY, BRONZE TRIM, BOLTED BONNET, RISING STEM, HANDWHEEL, OUTSIDE SCREW AND YOKE, ROTATING PLUG-TYPE DISC WITH RENEWABLE SEAT RING AND DISC, FLANGED ENDS.

2.08 BALL VALVES
A. UP TO AND INCLUDING 2 INCHES:
1. BRONZE ONE PIECE BODY, CHROME PLATED BRASS BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE WITH BALANCING STOPS, SOLDER ENDS WITH UNION.
B. OVER 2 INCHES:
1. CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEAT AND STUFFING BOX SEALS, LEVER HANDLE, FLANGED.
C. BALL VALVES ARE REQUIRED FOR USE ON ALL PIPE SIZED 2" OR SMALLER.

PART 3 EXECUTION

3.01 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 USING JOINTING SYSTEM SPECIFIED.
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. REFER TO SECTION 232500 FOR ADDITIONAL REQUIREMENTS.

3.02 INSTALLATION
A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
C. ROUTE PIPING IN ORDERLY MANNER, PARALLEL TO BUILDING STRUCTURE, AND MAINTAIN GRADIENT.
D. INSTALL PIPING TO CONSERVE BUILDING SPACE AND TO AVOID INTERFERE WITH USE OF SPACE.
E. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
F. SLEEVE PIPE PASSING THROUGH PARTITIONS, WALLS AND FLOORS.
G. SLOPE PIPING AND ARRANGE TO DRAIN AT LOW POINTS.
H. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
I. PIPE HANGERS AND SUPPORTS:
1. INSTALL IN ACCORDANCE WITH ASME B31.9.
2. SUPPORT HORIZONTAL PIPING AS SCHEDULED.
3. INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
4. PLACE HANGERS WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
5. USE HANGERS WITH 1-1/2 INCH MINIMUM VERTICAL ADJUSTMENT. DESIGN HANGERS FOR PIPE MOVEMENT WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
6. SUPPORT VERTICAL PIPING AT EVERY OTHER FLOOR. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
7. WHERE SEVERAL PIPES CAN BE INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
K. USE ECCENTRIC REDUCERS TO MAINTAIN TOP OF PIPE LEVEL.
L. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.

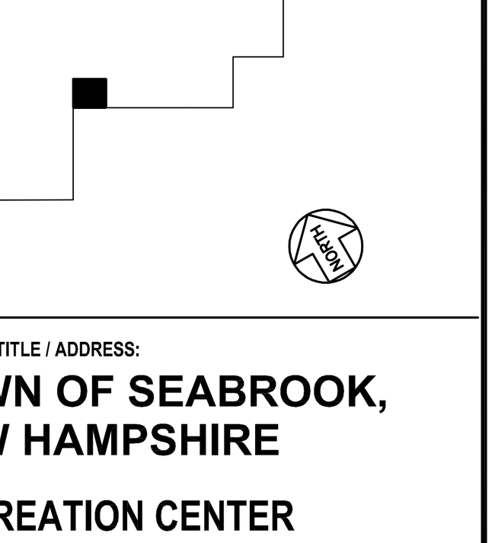
END OF SECTION

TURNER GROUP

Turner Building Science & Design, LLC

26 Pinewood Lane
Harrison, Maine 04040
t:207.583.4571
turnerbuildingscience.com

ENGINEERS • BUILDING SCIENTISTS



KEY PLAN:

PROJECT TITLE / ADDRESS:

TOWN OF SEABROOK, NEW HAMPSHIRE

RECREATION CENTER BOILER REPLACEMENT

311 LAFAYETTE ROAD
SEABROOK, NH 03874

ISSUE:

PERMIT AND CONSTRUCTION 08/30/19

PROJ. NO.:	S1311
SCALE:	AS NOTED
DESN. BY:	SMC
DRAWN BY:	SMC
CHKD BY:	TWB
ISSUE DATE:	08/30/19

STAMP

STATE OF NEW HAMPSHIRE – THOMAS W. BETTERIDGE No. 13988 – LICENSED – PROFESSIONAL ENGINEER
08/30/2019

REVISIONS:

SHEET TITLE:

SPECIFICATIONS 1 OF 2

M2.1

SECTION 232114 HYDRONIC SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. AIR VENTS.
- B. AIR SEPARATORS.
- C. RELIEF VALVES.

1.02 RELATED REQUIREMENTS
- A. SECTION 232113 – HYDRONIC PIPING.

1.03 REFERENCE STANDARDS
- A. ASME (BPV VIII, 1) – BOILER AND PRESSURE VESSEL CODE, SECTION VIII, DIVISION 1 – RULES FOR CONSTRUCTION OF PRESSURE VESSELS; THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS; 2007.

1.04 SUBMITTALS
- A. PRODUCT DATA: PROVIDE PRODUCT DATA FOR MANUFACTURED PRODUCTS AND ASSEMBLIES REQUIRED FOR THIS PROJECT. INCLUDE COMPONENT SIZES, ROUGH-IN REQUIREMENTS, SERVICE SIZES, AND FINISHES. INCLUDE PRODUCT DESCRIPTION, MODEL AND DIMENSIONS.
- B. MANUFACTURER'S INSTALLATION INSTRUCTIONS: INDICATE HANGING AND SUPPORT METHODS, JOINING PROCEDURES.
- C. MAINTENANCE DATA: INCLUDE INSTALLATION INSTRUCTIONS, ASSEMBLY VIEWS, LUBRICATION INSTRUCTIONS, AND REPLACEMENT PARTS LIST.

PART 2 PRODUCTS

2.01 AIR VENTS
- A. MANUFACTURERS:
  1. ARMSTRONG INTERNATIONAL, INC; MODEL : WWW.ARMSTRONGINTERNATIONAL.COM.
  2. ITT BELL & GOSSETT; MODEL : WWW.BELLGOSSETT.COM.
  3. TACO, INC; MODEL : WWW.TACO-HVAC.COM.
  4. HONEYWELL-BRAUKMAN.
- B. MANUAL AIR VENTS AT PIPING HIGH POINTS SHALL BE PROVIDED WITH AIR CHAMBERS WITH MINIMUM CHAMBER DIAMETER OF 3/4" AND MINIMUM CHAMBER LENGTH OF 5". PROVIDE REDUCERS AND 1/4" BRASS PETCOCK OR BALL VALVE TO VENT AIR CHAMBER.
- C. AUTOMATIC AIR VENTS SHALL BE EQUAL TO HONEYWELL-BRAUKMAN. PROVIDE 5" HIGH AIR CHAMBER AT ALL VENTS FULL LINE SIZE UP TO 2" PIPE AND 2" SIZE FOR ALL LARGER PIPE. PROVIDE BRASS PETCOCK OR SCREWED BALL VALVE AT CONNECTION TO TEACH AIR VENT TO ALLOW CHANGING THE VENT WITHOUT DRAINING PIPING.

2.02 AIR SEPARATORS
- A. IN-LINE AIR SEPARATORS:
  1. MANUFACTURERS:
     - a. ITT BELL & GOSSETT: WWW.BELLGOSSETT.COM.
     - b. TACO, INC: WWW.TACO-HVAC.COM.
  2. CAST IRON FOR SIZES 1-1/2 INCH AND SMALLER, OR STEEL FOR SIZES 2 INCH AND LARGER; TESTED AND STAMPED IN ACCORDANCE WITH ASME (BPV VIII, 1); FOR 125 PSI OPERATING PRESSURE.

2.03 RELIEF VALVES
- A. BRONZE BODY, TEFLON SEAT, STAINLESS STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT PRESSURE ACTUATED, CAPACITIES ASME CERTIFIED AND LABELED.

PART 3 EXECUTION

3.01 INSTALLATION
- A. INSTALL SPECIALTIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. PROVIDE MANUAL AIR VENTS AT SYSTEM HIGH POINTS AND AS INDICATED.
- C. FOR AUTOMATIC AIR VENTS IN CEILING SPACES OR OTHER CONCEALED LOCATIONS, PROVIDE VENT TUBING TO NEAREST DRAIN.
- D. PROVIDE AIR SEPARATOR ON SUCTION SIDE OF SYSTEM CIRCULATION PUMP AND CONNECT TO EXPANSION TANK.
- E. PROVIDE VALVED DRAIN AND HOSE CONNECTION ON STRAINER BLOW DOWN CONNECTION.
- F. PROVIDE RELIEF VALVES ON PRESSURE TANKS, LOW PRESSURE SIDE OF REDUCING VALVES, HEAT EXCHANGERS, AND EXPANSION TANKS.
- G. 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.
- H. PIPE RELIEF VALVE OUTLET TO NEAREST FLOOR DRAIN.

END OF SECTION

SECTION 233100 HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. METAL DUCTWORK.
- B. CASING AND PLENUMS.

1.02 RELATED REQUIREMENTS
- A. SECTION 230713 – DUCT INSULATION: EXTERNAL INSULATION AND DUCT LINER.

1.03 REFERENCE STANDARDS
- A. ASTM A36/A36M – STANDARD SPECIFICATION FOR CARBON STRUCTURAL STEEL; 2008.
- B. ASTM A240/A240M – STANDARD SPECIFICATION FOR CHROMIUM AND CHROMIUM-NICKEL STAINLESS STEEL PLATE, SHEET, AND STRIP FOR PRESSURE VESSELS AND GENERAL APPLICATIONS; 2011A.
- C. ASTM A480/A480M – STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR FLAT-ROLLED STAINLESS AND HEAT-RESISTING STEEL PLATE, SHEET, AND STRIP; 2011A.
- D. ASTM A653/A653M – STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS; 2010.
- E. ASTM E84 – STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS; 2010B.
- F. SMACNA (DCS) – HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE; SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION; 2005.

1.04 SUBMITTALS
- A. PRODUCT DATA: PROVIDE DATA FOR DUCT MATERIALS.

1.05 FIELD CONDITIONS
- A. DO NOT INSTALL DUCT SEALANTS WHEN TEMPERATURES ARE LESS THAN THOSE RECOMMENDED BY SEALANT MANUFACTURERS.
- B. MAINTAIN TEMPERATURES WITHIN ACCEPTABLE RANGE DURING AND AFTER INSTALLATION OF DUCT SEALANTS.

PART 2 PRODUCTS

2.01 DUCT ASSEMBLIES
- A. ALL DUCTS: GALVANIZED STEEL, UNLESS OTHERWISE INDICATED.
- B. LOW PRESSURE SUPPLY (HEATING SYSTEMS): 1/2 INCH W.G. PRESSURE CLASS, GALVANIZED STEEL.
- C. OUTSIDE AIR INTAKE: 1/2 INCH W.G. PRESSURE CLASS, GALVANIZED STEEL.
- D. COMBUSTION AIR: 1/2 INCH W.G. PRESSURE CLASS, GALVANIZED STEEL.

2.02 MATERIALS
- A. GALVANIZED STEEL FOR DUCTS: HOT-DIPPED GALVANIZED STEEL SHEET, ASTM A653/A653M FS TYPE B, WITH G60/Z180 COATING.
- B. STAINLESS STEEL FOR DUCTS: ASTM A 240/A 240M, TYPE 304.
- C. JOINT SEALERS AND SEALANTS: NON-HARDENING, WATER RESISTANT, MILDEW AND MOLD RESISTANT.
  1. TYPE: HEAVY MASTIC OR LIQUID USED ALONE OR WITH TAPE, SUITABLE FOR JOINT CONFIGURATION AND COMPATIBLE WITH SUBSTRATES, AND RECOMMENDED BY MANUFACTURER FOR PRESSURE CLASS OF DUCTS.
  2. VOC CONTENT: NOT MORE THAN 250 G/L, EXCLUDING WATER.
  3. SURFACE BURNING CHARACTERISTICS: FLAME SPREAD OF ZERO, SMOKE DEVELOPED OF ZERO, WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- D. HANGER ROD: ASTM A36/A36M; STEEL, GALVANIZED; THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUSLY THREADED.

2.03 DUCTWORK FABRICATION
- A. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE, AND AS INDICATED.
- B. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURES INDICATED.
- C. 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 MUST BE USED, PROVIDE AIR FOIL TURNING VANES OF PERFORATED METAL WITH GLASS FIBER INSULATION.
- D. INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE; MAXIMUM 30 DEGREES DIVERGENCE UPSTREAM OF EQUIPMENT AND 45 DEGREES CONVERGENCE DOWNSTREAM.
- E. FABRICATE CONTINUOUSLY WELDED ROUND AND OVAL DUCT FITTINGS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE.
- F. WHERE DUCTS ARE CONNECTED TO EXTERIOR WALL LOUVERS AND DUCT OUTLET IS SMALLER THAN LOUVER FRAME, PROVIDE BLANK-OUT PANELS SEALING LOUVER AREA AROUND DUCT. USE SAME MATERIAL AS DUCT, PAINTED BLACK ON EXTERIOR SIDE; SEAL TO LOUVER FRAME AND DUCT.

PART 3 EXECUTION

3.01 INSTALLATION
- A. INSTALL, SUPPORT, AND SEAL DUCTS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE.
- B. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- C. DURING CONSTRUCTION PROVIDE TEMPORARY CLOSURES OF METAL OR TAPED POLYETHYLENE ON OPEN DUCTWORK TO PREVENT CONSTRUCTION DUST FROM ENTERING DUCTWORK SYSTEM.
- D. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS. FOR LINED DUCTS, MAINTAIN SIZES INSIDE LINING.
- E. PROVIDE OPENINGS IN DUCTWORK WHERE REQUIRED TO ACCOMMODATE THERMOMETERS AND CONTROLLERS. PROVIDE PILOT TUBE OPENINGS WHERE REQUIRED FOR TESTING OF SYSTEMS, COMPLETE WITH METAL CAN WITH SPRING DEVICE OR SCREW TO ENSURE AGAINST AIR LEAKAGE. WHERE OPENINGS ARE PROVIDED IN INSULATED DUCTWORK, INSTALL INSULATION MATERIAL INSIDE A METAL RING.
- F. LOCATE DUCTS WITH SUFFICIENT SPACE AROUND EQUIPMENT TO ALLOW NORMAL OPERATING AND MAINTENANCE ACTIVITIES.

END OF SECTION

SECTION 235100 BREECHINGS, CHIMNEYS, AND STACKS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. FABRICATED BREECHINGS.
- B. MANUFACTURED CHIMNEYS FOR GAS FIRED EQUIPMENT.

1.02 RELATED REQUIREMENTS
- A. SECTION 230716 – HVAC EQUIPMENT INSULATION.

1.03 REFERENCE STANDARDS
- A. ASTM A653/A653M – STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVANNEALED) BY THE HOT-DIP PROCESS; 2010.
- B. SMACNA (DCS) – HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE; SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION; 2005.
- C. UL 441 – STANDARD FOR GAS VENTS; UNDERWRITERS LABORATORIES INC.; CURRENT EDITION, INCLUDING ALL REVISIONS.

1.04 DEFINITIONS
- A. BREECHING: VENT CONNECTOR.
- B. CHIMNEY: PRIMARILY VERTICAL SHAFT ENCLOSING AT LEAST ONE VENT FOR CONDUCTING FLUE GASES OUTDOORS.
- C. VENT: THAT PORTION OF A VENTING SYSTEM DESIGNED TO CONVEY FLUE GASES DIRECTLY OUTDOORS FROM A VENT CONNECTOR OR FROM AN APPLIANCE WHEN A VENT CONNECTOR IS NOT USED.
- D. VENT CONNECTOR: THAT PART OF A VENTING SYSTEM THAT CONDUCTS THE FLUE GASES FROM THE FLUE COLLAR OF AN APPLIANCE TO A CHIMNEY OR VENT, AND MAY INCLUDE A DRAFT CONTROL DEVICE.

1.05 SUBMITTALS
- A. PRODUCT DATA: PROVIDE DATA INDICATING FACTORY BUILT CHIMNEYS, INCLUDING DIMENSIONAL DETAILS OF COMPONENTS AND FLUE CAPS, DIMENSIONS AND WEIGHTS, ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS.
- B. MANUFACTURER'S INSTRUCTIONS: INCLUDE INSTALLATION INSTRUCTIONS, AND INDICATE ASSEMBLY, SUPPORT DETAILS, AND CONNECTION REQUIREMENTS.

1.06 REGULATORY REQUIREMENTS
- A. CONFORM TO APPLICABLE CODE FOR INSTALLATION OF NATURAL GAS BURNING APPLIANCES AND EQUIPMENT.

PART 2 PRODUCTS

2.01 BREECHINGS
- A. BREECHINGS LESS THAN 24 INCHES IN DIAMETER: FABRICATE FROM HOT-DIPPED GALVANIZED STEEL SHEET, ASTM A653/A653M FS, WITH G90/Z275 COATING; MAKE LONGITUDINAL SEAMS USING PIPE LOCK OR FLAT LOCK GROOVE SEAM AND MAKE END JOINTS BEADED AND CRIMPED.
- B. MINIMUM METAL THICKNESSES:
  1. SIZES UP TO 12 INCHES: 18 GAGE.
  2. SIZES 13 TO 24 INCHES: 16 GAGE.
- C. PROVIDE ADJUSTABLE SELF-ACTUATING BAROMETRIC DRAFT DAMPERS, WHERE INDICATED, FULL SIZE OF BREECHING.
- D. PROVIDE CLEANOUT DOORS OF SAME GAGE AS BREECHING, WHERE INDICATED ON DRAWINGS.

2.02 TYPE B DOUBLE WALL GAS VENTS
- A. FABRICATION: INNER PIPE OF SHEET ALUMINUM, AND OUTER PIPE OF GALVANIZED SHEET STEEL, TESTED IN COMPLIANCE WITH UL 441.

PART 3 EXECUTION

3.01 INSTALLATION
- A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. INSTALL BREECHINGS WITH MINIMUM OF JOINTS. ALIGN ACCURATELY AT CONNECTIONS, WITH INTERNAL SURFACES SMOOTH.
- C. SUPPORT BREECHINGS FROM BUILDING STRUCTURE, RIGIDLY WITH SUITABLE TIES, BRACES, HANGERS AND ANCHORS TO HOLD TO SHAPE AND PREVENT BUCKLING. SUPPORT VERTICAL BREECHINGS, CHIMNEYS, AND STACKS AT 12 FOOT SPACING, TO ADJACENT STRUCTURAL SURFACES, OR AT FLOOR PENETRATIONS. REFER TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS – METAL AND FLEXIBLE FOR EQUIVALENT DUCT SUPPORT CONFIGURATION AND SIZE.
- D. PITCH BREECHINGS WITH POSITIVE SLOPE UP FROM FUEL-FIRED EQUIPMENT TO CHIMNEY OR STACK.
- E. INSULATE BREECHINGS IN ACCORDANCE WITH SECTION 220716.
- F. FOR TYPE B DOUBLE WALL GAS VENTS, MAINTAIN UL LISTED MINIMUM CLEARANCES FROM COMBUSTIBLES. ASSEMBLE PIPE AND ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION.

END OF SECTION

SECTION 235223 CAST-IRON BOILERS

PART 1 GENERAL

1.01 SECTION INCLUDES
- A. BOILERS.
- B. CONTROLS AND BOILER TRIM.
- C. HOT WATER CONNECTIONS.
- D. FUEL CONNECTION.
- E. COLLECTOR, DRAFT HOOD, AND CHIMNEY CONNECTION.

1.02 RELATED REQUIREMENTS
- A. SECTION 033000 – CAST-IN-PLACE CONCRETE.
- B. SECTION 232114 – HYDRONIC SPECIALTIES.
- C. SECTION 232214 – STEAM AND CONDENSATE HEATING SPECIALTIES.
- D. SECTION 235100 – BREECHINGS, CHIMNEYS, AND STACKS.

1.03 REFERENCE STANDARDS
- A. NFPA 54 – NATIONAL FUEL GAS CODE; NATIONAL FIRE PROTECTION ASSOCIATION; 2009.

1.04 SUBMITTALS
- A. PRODUCT DATA: PROVIDE DATA INDICATING GENERAL LAYOUT, DIMENSIONS, AND SIZE AND LOCATION OF WATER, GAS, AND VENT CONNECTIONS, AND ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS.
- B. MANUFACTURER'S INSTRUCTIONS: SUBMIT MANUFACTURER'S COMPLETE INSTALLATION INSTRUCTIONS.
- C. OPERATION AND MAINTENANCE DATA: INCLUDE MANUFACTURER'S DESCRIPTIVE LITERATURE, OPERATING INSTRUCTIONS, CLEANING PROCEDURES, REPLACEMENT PARTS LIST, AND MAINTENANCE AND REPAIR DATA.
- D. WARRANTY: SUBMIT MANUFACTURER WARRANTY AND ENSURE FORMS HAVE BEEN COMPLETED IN OWNER'S NAME AND REGISTERED WITH MANUFACTURER.

1.05 DELIVERY, STORAGE, AND HANDLING
- A. PROTECT UNITS BEFORE, DURING, AND AFTER INSTALLATION FROM DAMAGE TO CASING BY LEAVING FACTORY SHIPPING PACKAGING IN PLACE UNTIL IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

1.06 WARRANTY
- A. SEE SECTION 017800 – CLOSEOUT SUBMITTALS, FOR ADDITIONAL WARRANTY REQUIREMENTS.
- B. PROVIDE A TEN YEAR PRO-RATED WARRANTY FOR CAST IRON BOILER SECTIONS.

PART 2 PRODUCTS

2.01 MANUFACTURERS
- A. HB SMITH.
- B. WEIL-MCLAIN.
- C. VIESSMANN.

2.02 PERFORMANCE REQUIREMENTS
- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY, AND MARKED FOR INTENDED LOCATION AND APPLICATION.
- B. ASME COMPLIANCE: FABRICATE AND LABEL BOILERS TO COMPLY WITH 2010 ASME BOILER AND PRESSURE VESSEL CODE.
- C. ASHRAE/IES 90.1 COMPLIANCE: BOILERS SHALL HAVE MINIMUM EFFICIENCY ACCORDING TO "GAS AND OIL FIRED BOILERS – MINIMUM EFFICIENCY REQUIREMENTS."
- D. I=B=R COMPLIANCE: BOILERS SHALL BE TESTED AND RATED ACCORDING TO AHRI'S "RATING PROCEDURE FOR HEATING BOILERS" AND "TESTING STANDARD FOR COMMERCIAL BOILERS," WITH I=B=R EMBLEM ON A NAMEPLATE AFFIXED TO BOILER.

2.03 MANUFACTURED UNITS
- A. HOT WATER BOILERS: SUITABLE FOR NATURAL DRAFT WITH INSULATED JACKET, SECTIONAL CAST IRON HEAT EXCHANGER, NATURAL GAS BURNING SYSTEM, REFRACTORY, CONTROLS, AND BOILER TRIM AND FILL SYSTEM CONSISTING OF DIAPHRAGM TYPE EXPANSION TANK, FILL AND CHECK VALVE, AND AUTOMATIC AIR VENT.
- B. PROVIDE WATER WALL DESIGN CONSISTING OF WATER BACKED COMBUSTION AREA WITH WATER CIRCULATING AROUND FIREBOX. REFRACTORY CHAMBER OR SEPARATE BASE NOT REQUIRED.

2.04 FABRICATION
- A. ASSEMBLY: CAST IRON SECTIONS WITH 30 PSIG WATER ASME BOILERS AND PRESSURE VESSELS CODE RATING, ASSEMBLED WITH PUSH NIPPLES OR GASKETS AND DRAW RODS.
- B. ACCESS: TO FLUE PASSAGES FOR CLEANING AND FLAME OBSERVATION PORTS.
- C. STRUCTURAL BASE: ALUMINIZED STEEL LINED WITH HIGH TEMPERATURE MINERAL FIBER INSULATING PANELS.
- D. JACKET: GLASS FIBER INSULATED STEEL JACKET, FINISHED WITH FACTORY APPLIED BAKED ENAMEL.

2.05 HOT WATER BOILER TRIM
- A. ASME RATED PRESSURE RELIEF VALVE, 30 PSIG.
- B. COMBINATION WATER PRESSURE AND TEMPERATURE GAGE.
- C. LOW WATER CUT-OFF TO PREVENT BURNER OPERATION WHEN BOILER WATER FALLS BELOW SAFE LEVEL.
- D. OPERATING TEMPERATURE CONTROLLER WITH OUTDOOR RESET TO MAINTAIN BOILER WATER TEMPERATURE.
- E. HIGH LIMIT TEMPERATURE CONTROLLER WITH MANUAL RESET FOR BURNER TO PREVENT BOILER WATER TEMPERATURE FROM EXCEEDING SAFE SYSTEM TEMPERATURE.
- F. BOILER AIR VENT.

2.06 FUEL BURNING SYSTEM
- A. BURNER OPERATION: MODULATING WITH LOW FIRE POSITION FOR IGNITION.
- B. GAS BURNER: ATMOSPHERIC TYPE FOR NATURAL GAS ADJUSTABLE COMBUSTION AIR SUPPLY, PRESSURE REGULATOR, GAS VALVES, MANUAL SHUT-OFF, INTERMITTENT SPARK OR GLOW COIL IGNITION, FLAME SENSING DEVICE, AND AUTOMATIC 100 PERCENT SHUT-OFF.
- C. GAS BURNER SAFETY CONTROLS: ENERGIZE IGNITION, LIMIT TIME FOR ESTABLISHMENT OF FLAME, PREVENT OPENING OF GAS VALVE UNTIL PILOT FLAME IS PROVEN, STOP GAS FLOW ON IGNITION FAILURE, ENERGIZE BLOWER MOTOR, AND AFTER AIR FLOW PROVEN AND SLIGHT DELAY, ALLOW GAS VALVE TO OPEN.
- E. CONTROLS: PRE-WIRED, FACTORY ASSEMBLED ELECTRONIC CONTROLS IN CONTROL CABINET WITH FLAME SCANNER OR DETECTOR, PROGRAMMING CONTROL, RELAYS, AND SWITCHES. PROVIDE PRE-PURGE AND POST-PURGE IGNITION AND SHUT-DOWN OF BURNER IN EVENT OF IGNITION PILOT AND MAIN FLAME FAILURE WITH MANUAL RESET.

PART 3 EXECUTION

3.01 INSTALLATION
- A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. INSTALL BOILER ON CONCRETE HOUSEKEEPING BASE, SIZED MINIMUM 4 INCHES LARGER THAN BOILER BASE. REFER TO SECTION 033000.
- C. PROVIDE CONNECTION OF NATURAL GAS SERVICE IN ACCORDANCE WITH REQUIREMENTS OF NFPA 54 AND APPLICABLE CODES.
- D. PROVIDE PIPING CONNECTIONS AND ACCESSORIES AS INDICATED; REFER TO SECTION 232214.

3.02 SYSTEM STARTUP
- A. PROVIDE THE SERVICES OF MANUFACTURER'S FIELD REPRESENTATIVE FOR STARTING AND TESTING UNIT.

3.03 CLOSEOUT ACTIVITIES
- A. TRAIN OPERATING PERSONNEL IN OPERATION AND MAINTENANCE OF UNITS.

END OF SECTION

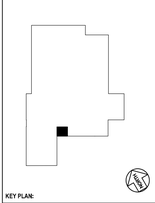
TURNER GROUP

Turner Building Science & Design, LLC

26 Pinewood Lane
Harrison, Maine 04040
t:207.583.4571
turnerbuildingscience.com

ENGINEERS • BUILDING SCIENTISTS

KEY PLAN:



PROJECT TITLE / ADDRESS:

TOWN OF SEABROOK, NEW HAMPSHIRE

RECREATION CENTER BOILER REPLACEMENT

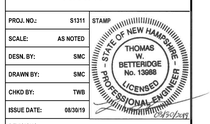
311 LAFAYETTE ROAD
SEABROOK, NH 03874

ISSUE:

PERMIT AND CONSTRUCTION 08/30/19

PROJ. NO.:	S1311
SCALE:	AS NOTED
DESN. BY:	SMC
DRAWN BY:	SMC
CHKD BY:	TWB
ISSUE DATE:	08/30/19

STAMP



REVISIONS

SHEET TITLE:

SPECIFICATIONS 2 OF 2

M2.2

DRAFT

AIA® Document A107™ – 2007

Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope

AGREEMENT made as of the day of in the year Two Thousand Nineteen
(In words, indicate day, month and year.)

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

Town of Seabrook
99 Lafayette Road
Seabrook, NH

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

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

SEABROOK RECREATION CENTER BOILER PROJECT

The Owner's Project Manager (OPM):
(Name, legal status, address and other information)

The Owner's Design Consultant is:

The HL Turner Group, Inc.
27 Locke Road
Concord, NH 03301

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.

TABLE OF ARTICLES

ARTICLE 1 THE WORK OF THIS CONTRACT

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

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 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.)

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

§ 2.3 The Contractor shall achieve Substantial Completion of the entire Work not later than

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 3 CONTRACT SUM

§ 3.1 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 one of the following:
(Check the appropriate box.)

[X] Stipulated Sum, in accordance with Section 3.2 below

[ ] Cost of the Work plus the Contractor's Fee, in accordance with Section 3.3 below

[ ] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 3.4 below

(Based on the selection above, complete Section 3.2, 3.3 or 3.4 below.)

§ 3.2 The Stipulated Sum shall be ( ), subject to additions and deductions as provided in the Contract Documents.

§ 3.2.1 The Stipulated 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.)

§ 3.2.2 Unit prices, if any:
(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit ($0.00)
Bond		
Labor Rate for additional services		

§ 3.2.3 Allowances included in the stipulated sum, if any: There are no Allowances
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Allowance
NONE	NONE

~~**§ 3.3 COST OF THE WORK PLUS CONTRACTOR'S FEE**~~
~~**§ 3.3.1** The Cost of the Work is as defined in Exhibit A, Determination of the Cost of the Work.~~

§ 3.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee and the method of adjustment to the Fee for changes in the Work.)

§ 3.4 COST OF THE WORK PLUS CONTRACTOR'S FEE WITH A GUARANTEED MAXIMUM PRICE
§ 3.4.1 The Cost of the Work is as defined in Exhibit A, Determination of the Cost of the Work.

§ 3.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee and the method of adjustment to the Fee for changes in the Work.)

§ 3.4.3 GUARANTEED MAXIMUM PRICE
§ 3.4.3.1 The sum of the Cost of the Work and the Contractor's Fee is guaranteed by the Contractor not to exceed « » ($ « »), subject to additions and deductions by changes in the Work as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.
(Insert specific provisions if the Contractor is to participate in any savings.)

§ 3.4.3.2 The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

« »

§ 3.4.3.3 Unit Prices, if any:
(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit ($0.00)

§ 3.4.3.4 Allowances included in the Guaranteed Maximum Price, if any:
(Identify and state the amounts of any allowances, and state whether they include labor, materials, or both.)

Item	Allowance

§ 3.4.3.5 Assumptions, if any, on which the Guaranteed Maximum Price is based:

« »

ARTICLE 4 PAYMENTS

§ 4.1 PROGRESS PAYMENTS

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

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

§ 4.1.3 Provided that an Application for Payment is received by the Design Consultant not later than the 5th day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the 5th day of the following month. If an Application for Payment is received by the Design Consultant after the date fixed above, payment shall be made by the Owner not later than Thirty (30) days after the Design Consultant receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 4.1.4 Retainage, if any, shall be withheld as follows:

10%

§ 4.1.5 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.)

% »

§ 4.2 FINAL PAYMENT
§ 4.2.1 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 18.2, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the contractor has submitted a final accounting for the Cost of the Work, where payment is on the basis of the Cost of the Work with or without a guaranteed maximum price; and

.3 a final Certificate for Payment has been issued by the Design Consultant .

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

ARTICLE 5 DISPUTE RESOLUTION
§ 5.1 BINDING DISPUTE RESOLUTION
For any claim subject to, but not resolved by, mediation pursuant to Section 21.3, 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 in a court of competent jurisdiction.)

[ ] Arbitration pursuant to Section 21.4 of this Agreement

[X] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

ARTICLE 6 ENUMERATION OF CONTRACT DOCUMENTS
§ 6.1 The Contract Documents are defined in Article 7 and, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 6.1.1 The Agreement is this executed AIA Document A107–2007, Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope.

§ 6.1.2 The Supplementary and other Conditions of the Contract: There are no Supplementary Conditions

Document	Title	Date	Pages

§ 6.1.3 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)
Attached as Exhibit B

Section	Title	Date	Pages

§ 6.1.4 The Drawings:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)
Attached as Exhibit B

Number	Title	Date

§ 6.1.5 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 enumerated in this Article 6.

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

There are no Additional Documents

.3 Other documents:
(List here any additional documents that are intended to form part of the Contract Documents.)

None

ARTICLE 7 GENERAL PROVISIONS

§ 7.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in Article 6 and consist of this Agreement (including, if applicable, Supplementary and other Conditions of the Contract), Drawings, Specifications, Addenda issued prior to the execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement. 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 Design Consultant. 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 to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 7.2 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 between any persons or entities other than the Owner and the Contractor.

§ 7.3 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.

§ 7.4 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 Design Consultant and the Design Consultant'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.

§ 7.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 7.5.1 The Design Consultant and the Design Consultant'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 Design Consultant or Design Consultant's consultants' reserved rights.

§ 7.5.2 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, Design Consultant and the Design Consultant's consultants.

§ 7.6 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 transmission, unless otherwise provided in the Agreement or in the Contract Documents.

ARTICLE 8 OWNER
§ 8.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 8.1.1 The Owner shall furnish all necessary surveys and a legal description of the site.

§ 8.1.2 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.

§ 8.1.3 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 9.6.1, the Owner shall secure and pay for other necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 8.2 OWNER'S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or repeatedly fails to carry out the 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 is 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.

§ 8.3 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, without prejudice to any other remedy the Owner may have, may correct such deficiencies and may deduct the reasonable cost thereof, including Owner's expenses and

compensation for the Owner's Representative 's services made necessary thereby, from the payment then or thereafter due the Contractor.

ARTICLE 9 CONTRACTOR

§ 9.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 9.1.1 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.

§ 9.1.2 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 8.1.1, 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 Design Consultant any errors, inconsistencies, or omissions discovered by or made known to the Contractor as a request for information in such form as the Design Consultant 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.

§ 9.1.3 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 Design Consultant any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Design Consultant may require.

§ 9.2 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 9.2.1 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.

§ 9.2.2 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.

§ 9.3 LABOR AND MATERIALS

§ 9.3.1 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.

§ 9.3.2 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 skilled in tasks assigned to them.

§ 9.3.3 The Contractor may make a substitution only with the consent of the Owner, after evaluation by the Design Consultant and in accordance with a Modification.

§ 9.4 WARRANTY

The Contractor warrants to the Owner and Design Consultant 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 under normal usage.

§ 9.5 TAXES
The Contractor shall pay sales, consumer, use and other similar taxes that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 9.6 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 9.6.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as 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.

§ 9.6.2 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. 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.

§ 9.7 ALLOWANCES
The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. The Owner shall select materials and equipment under allowances with reasonable promptness. Allowance amounts shall include the costs to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts. Allowance amounts shall not include the Contractor's costs for unloading and handling at the site, labor, installation, overhead, and profit.

§ 9.8 CONTRACTOR'S CONSTRUCTION SCHEDULES
§ 9.8.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Design Consultant'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.

§ 9.8.2 The Contractor shall perform the Work in general accordance with the most recent schedule submitted to the Owner and Design Consultant.

§ 9.9 SUBMITTALS
§ 9.9.1 The Contractor shall review for compliance with the Contract Documents and submit to the Design Consultant Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in coordination with the Contractor's construction schedule and in such sequence as to allow the Design Consultant reasonable time for review. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Design Consultant 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. The Work shall be in accordance with approved submittals.

§ 9.9.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents.

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

§ 9.11 CUTTING AND PATCHING
The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 9.12 CLEANING UP

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 material from and about the Project.

§ 9.13 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 Design Consultant 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 Design Consultant . 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 Design Consultant.

§ 9.14 ACCESS TO WORK

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

§ 9.15 INDEMNIFICATION

§ 9.15.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Design Consultant, Design Consultant'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 which would otherwise exist as to a party or person described in this Section 9.15.1.

§ 9.15.2 In claims against any person or entity indemnified under this Section 9.15 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 9.15.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 10 DESIGN CONSULTANT

§ 10.1 The Design Consultant will provide administration of the Contract and will be an Owner's representative during construction, until the date the Design Consultant issues the final Certificate for Payment. The Design Consultant will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 10.2 The Design Consultant will visit the site at intervals appropriate to the stage of the construction 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 Design Consultant will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Design Consultant will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 10.3 On the basis of the site visits, the Design Consultant 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 Design Consultant will not be responsible for the Contractor's

failure to perform the Work in accordance with the requirements of the Contract Documents. The Design Consultant 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.

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

§ 10.5 The Design Consultant has authority to reject Work that does not conform to the Contract Documents and to require inspection or testing of the Work.

§ 10.6 The Design Consultant 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.

§ 10.7 The Design Consultant will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Design Consultant will make initial decisions on all claims, disputes and other matters in question between the Owner and Contractor but will not be liable for results of any interpretations or decisions rendered in good faith.

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

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

ARTICLE 11 SUBCONTRACTORS

§ 11.1 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.

§ 11.2 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 Design Consultant the names of the Subcontractors or suppliers for each of the principal portions of the Work. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner or Design Consultant has made reasonable written objection within ten days after receipt of the Contractor's list of Subcontractors and suppliers. 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. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 11.3 Contracts between the Contractor and Subcontractors shall (1) require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the 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 the Contract Documents, assumes toward the Owner and Design Consultant, and (2) allow the Subcontractor the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner.

ARTICLE 12 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 12.1 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 21.

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

§ 12.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

ARTICLE 13 CHANGES IN THE WORK

§ 13.1 By appropriate Modification, changes in the Work may be accomplished after execution of the Contract. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and Contract Time being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Owner, Contractor and Design Consultant, or by written Construction Change Directive signed by the Owner and Design Consultant.

§ 13.2 Adjustments in the Contract Sum and Contract Time resulting from a change in the Work shall be determined by mutual agreement of the parties or, in the case of a Construction Change Directive signed only by the Owner and Design Consultant, by the Contractor's cost of labor, material, equipment, and reasonable overhead and profit, unless the parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive. The Design Consultant will make an interim determination of the amount of payment due for purposes of certifying the Contractor's monthly Application for Payment. When the Owner and Contractor agree on adjustments to the Contract Sum and Contract Time arising from a Construction Change Directive, the Design Consultant will prepare a Change Order.

§ 13.3 The Design Consultant will have 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 shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

§ 13.4 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be equitably adjusted as mutually agreed between the Owner and Contractor; provided that the Contractor provides notice to the Owner and Design Consultant promptly and before conditions are disturbed.

ARTICLE 14 TIME

§ 14.1 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.

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

§ 14.3 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 14.4 The date of Substantial Completion is the date certified by the Design Consultant in accordance with Section 15.4.3.

§ 14.5 If the Contractor is delayed at any time in the commencement or progress of the Work by changes ordered in the Work, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions not reasonably anticipated, unavoidable casualties or any causes beyond the Contractor's control, or by other causes which the Design Consultant determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Design Consultant may determine, subject to the provisions of Article 21.

ARTICLE 15 PAYMENTS AND COMPLETION

§ 15.1 APPLICATIONS FOR PAYMENT

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

§ 15.1.2 With each Application for Payment where the Contract Sum is based upon the Cost of the Work, or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor, less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 15.1.3 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 stored, and protected from damage, off the site at a location agreed upon in writing.

§ 15.1.4 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 other encumbrances adverse to the Owner's interests.

§ 15.2 CERTIFICATES FOR PAYMENT

§ 15.2.1 The Design Consultant 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 Design Consultant determines is properly due, or notify the Contractor and Owner in writing of the Design Consultant's reasons for withholding certification in whole or in part as provided in Section 15.2.3.

§ 15.2.2 The issuance of a Certificate for Payment will constitute a representation by the Design Consultant to the Owner, based on the Design Consultant's evaluations of the Work and the data comprising the Application for Payment, that, to the best of the Design Consultant'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 Design Consultant. 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 Design Consultant 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.

§ 15.2.3 The Design Consultant may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Design Consultant's opinion the representations to the Owner required by Section 15.2.2 cannot be made. If the Design Consultant is unable to certify payment in the amount of the Application, the Design Consultant will notify the Contractor and Owner as provided in Section 15.2.1. If the Contractor and the Design Consultant cannot agree on a revised amount, the Design Consultant will promptly issue a Certificate for Payment for the amount for which the Design Consultant is able to make such representations to the Owner. The Design Consultant 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 Design Consultant's

opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 9.2.2, 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.

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

§ 15.3 PROGRESS PAYMENTS

§ 15.3.1 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment, 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 similar manner.

§ 15.3.2 Neither the Owner nor Design Consultant shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 15.3.3 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.

§ 15.4 SUBSTANTIAL COMPLETION

§ 15.4.1 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.

§ 15.4.2 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 Design Consultant 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.

§ 15.4.3 Upon receipt of the Contractor's list, the Design Consultant will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When the Design Consultant determines that the Work or designated portion thereof is substantially complete, the Design Consultant will issue a Certificate of Substantial Completion which shall establish the date of Substantial Completion, establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and 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.

§ 15.4.4 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.

§ 15.5 FINAL COMPLETION AND FINAL PAYMENT

§ 15.5.1 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 Design Consultant will promptly make such inspection and,

when the Design Consultant finds the Work acceptable under the Contract Documents and the Contract fully performed, the Design Consultant will promptly issue a final Certificate for Payment stating that to the best of the Design Consultant 's knowledge, information and belief, and on the basis of the Design Consultant'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 Design Consultant's final Certificate for Payment will constitute a further representation that conditions stated in Section 15.5.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 15.5.2 Final payment shall not become due until the Contractor has delivered to the Owner a complete release of all liens arising out of this Contract or receipts in full covering all labor, materials and equipment for which a lien could be filed, or 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 costs and reasonable attorneys' fees.

§ 15.5.3 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.

§ 15.5.4 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 16 PROTECTION OF PERSONS AND PROPERTY

§ 16.1 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. 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.

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 and property and their protection from damage, injury or loss. The Contractor shall promptly remedy damage and loss to property 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 16.1.2 and 16.1.3, except for damage or loss attributable to acts or omissions of the Owner or Design Consultant 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 9.15.

§ 16.2 HAZARDOUS MATERIALS

§ 16.2.1 The Contractor is responsible for compliance with the requirements of 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 Design Consultant in writing. 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 shutdown, delay and start-up.

§ 16.2.2 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Design Consultant, Design Consultant'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 16.2.1 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.

§ 16.2.3 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.

ARTICLE 17 INSURANCE AND BONDS

§ 17.1 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, insurance for protection from claims under workers' compensation acts and other employee benefit acts which are applicable, claims for damages because of bodily injury, including death, and claims for damages, other than to the Work itself, to property which may arise out of or result from the Contractor's operations and completed operations under the Contract, whether such operations be by the Contractor or by a Subcontractor or anyone directly or indirectly employed by any of them. This insurance shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater, and shall include contractual liability insurance applicable to the Contractor's obligations under Section 9.15. Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. The Contractor shall cause the commercial liability coverage required by the Contract Documents to include: (1) the Owner, the Design Consultant and the Design Consultant'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.

§ 17.2 OWNER'S LIABILITY INSURANCE

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

§ 17.3 PROPERTY INSURANCE

§ 17.3.1 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 on an "all-risk" or equivalent policy form, including builder's risk, in the amount of the initial Contract Sum, plus the value of subsequent modifications and cost of materials supplied and 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 15.5 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 17.3.1 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and sub-subcontractors in the Project.

§ 17.3.2 The Owner shall file a copy of each policy with the Contractor before an exposure to loss may occur. 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.

§ 17.3.3 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 Design Consultant , Design Consultant's consultants, separate contractors described in Article 12, 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 Section 17.3 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 Design Consultant , Design Consultant's consultants, separate contractors described in Article 12, 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.

§ 17.3.4 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. 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.

§ 17.4 PERFORMANCE BOND AND PAYMENT BOND

§ 17.4.1 The Owner shall 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.

§ 17.4.2 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 18 CORRECTION OF WORK

§ 18.1 The Contractor shall promptly correct Work rejected by the Design Consultant 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 Design Consultant's services and expenses made necessary thereby, shall be at the Contractor's expense, unless compensable under Section A.2.7.3 in Exhibit A, Determination of the Cost of the Work.

§ 18.2 In addition to the Contractor's obligations under Section 9.4, 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 15.4.3, 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.

§ 18.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 8.3.

§ 18.4 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.

§ 18.5 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Article 18.

ARTICLE 19 MISCELLANEOUS PROVISIONS

§ 19.1 ASSIGNMENT OF CONTRACT

Neither party to the Contract shall assign the Contract without written consent of the other, except that 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.

§ 19.2 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 21.4.

§ 19.3 TESTS AND INSPECTIONS

Tests, inspections and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities shall be made at an appropriate time. 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 Design Consultant timely notice of when and where tests and inspections are to be made so that the Design Consultant 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 the costs to the Contractor.

§ 19.4 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

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 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 19.4.

ARTICLE 20 TERMINATION OF THE CONTRACT

§ 20.1 TERMINATION BY THE CONTRACTOR

If the Design Consultant fails to certify payment as provided in Section 15.2.1 for a period of 30 days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 4.1.3 for a period of 30 days, the Contractor may, upon seven additional days' written notice to the Owner and the Design Consultant , 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.

§ 20.2 TERMINATION BY THE OWNER FOR CAUSE

§ 20.2.1 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.

§ 20.2.2 When any of the above reasons exists, the Owner, upon certification by the Design Consultant that sufficient cause exists to justify such action, may, without prejudice to any other remedy the Owner may have and after giving the Contractor seven days' written notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever reasonable method the Owner may deem expedient. Upon 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.

§ 20.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 20.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 20.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Design Consultant'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 Design Consultant, upon application, and this obligation for payment shall survive termination of the Contract.

§ 20.3 TERMINATION BY THE OWNER FOR CONVENIENCE

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. 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 21 CLAIMS AND DISPUTES

§ 21.1 Claims, disputes and other matters in question arising out of or relating to this Contract, including those alleging an error or omission by the Design Consultant but excluding those arising under Section 16.2, shall be referred initially to the Design Consultant for decision. Such matters, except those waived as provided for in Section 21.8 and Sections 15.5.3 and 15.5.4, shall, after initial decision by the Design Consultant or 30 days after submission of the matter to the Design Consultant, be subject to mediation as a condition precedent to binding dispute resolution.

§ 21.2 If a claim, dispute or other matter in question relates to or is the subject of a mechanic's lien, the party asserting such matter may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 21.3 The parties shall endeavor to resolve their disputes by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with their 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 this Agreement, and filed with the person or entity administering the mediation. The request may be made concurrently with the binding dispute resolution 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, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 21.4 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 the Construction Industry Arbitration Rules in effect on the date of this Agreement. 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 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.

§ 21.5 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).

§ 21.6 Any party to an arbitration 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 a Claim not described in the written Consent.

§ 21.7 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.

§ 21.8 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 20. Nothing contained in this Section 21.8 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

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

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
Town of Seabrook, NH	
(Printed name and title)	*(Printed name and title)*