

# LEGAL NOTICE

## INVITATION TO BID

The **Town of Ridgefield** invites all interested parties to submit sealed bids on the following:

**BID DUE DATE:** Thursday, January 26, 2023  
**BID DUE TIME:** 11:00 AM  
**BID ITEM:** Barlow Mountain Pool HVAC Replacement  
**BID NUMBER:** 23-05

Terms and conditions as well as the description of items being bid are stated in the specifications. **Specifications may be obtained at the following address:**

**Town of Ridgefield  
Jacob Muller  
400 Main Street  
Ridgefield, CT 06877  
203 - 431 – 2720**

The return bid must be emailed, faxed or returned to the following contact below:

**TOWN OF RIDGEFIELD  
DIRECTOR OF PURCHASING  
BID NUMBER: 23-05  
400 MAIN STREET  
RIDGEFIELD, CT. 06877**

Bids must be received no later than the date and time stated above via email or fax. **For further information**, please call **Jacob Muller** at (203) 431-2720 or E-Mail at **[purchasing@ridgefieldct.org](mailto:purchasing@ridgefieldct.org)**

Results may be viewed at **[www.ridgefieldct.org](http://www.ridgefieldct.org)** in the Purchasing Section under Departments after the bid opening.

## Town of Ridgefield

### Barlow Mountain Pool HVAC Replacement

#### Instruction to Bidders

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1. Submit proposals in a sealed envelope plainly marked with bid number to identify this particular proposal or the bid may be faxed (203 431-2723) to emailed to [purchasing@ridgefieldct.org](mailto:purchasing@ridgefieldct.org).
2. Withdrawals of or amendments to bids received later than the time and date specified for bid opening will not be considered.
3. The Board of Selectmen of the Town of Ridgefield reserves the right to accept or reject any or all options, bids or proposals; to waive any technicality in any bid or part thereof, and to accept any bid deemed to be in the best interest of the Town of Ridgefield, Connecticut.
4. Bidders may be present at the opening of bids.
5. Bids may be held by the Town of Ridgefield for a period not to exceed sixty (60) days from the opening of bids for the purpose of reviewing the bids and investigating the qualifications of bidders prior to the awarding of the contract. Any RFI from potential bidders shall be received by Monday, January 16, 2023 at 2:00 PM.
6. Insurance requirements, if any, must be submitted with the bid. This includes any Hold Harmless requirements as well as Certificates of Insurance for the full amounts specified. **Unauthorized changes** to these forms, i.e. adding, striking out and/or changing any words, language or limits **will cause the bidder to be disqualified**.  
**Please Note:** Certificates of Insurance, if required, MUST name the Town of Ridgefield as **Additional Insured**. Failure to do so will mean disqualification from the Bid. There will no exceptions.
7. **Permits:** It is the Contractor's responsibility to obtain any necessary permits prior to the start of construction. All work shall be completed in compliance with the latest edition of the prevailing fire prevention and building codes in effect in the State of Connecticut, the latest edition of the State of Connecticut Building and Fire codes as well as local

Town Ridgefield Road Construction Standards, or as set forth in these specifications. Local permit fees shall be waived.

8. **Emergency Work:** The Contractor shall file with the Engineer a telephone number of a person authorized by him who may be contacted regarding emergency work at the job site that may be required during non-working hours for reasons of public safety. The person shall be readily available and have full authority to deal with any emergency that may occur.
9. **Sales Tax:** In accordance with the provisions of Special Act No. 77-98, as amended, and Section 12-412(a) of the Connecticut General Statutes, sales of tangible personal property and services to the Town are not subject to the Connecticut Sales and Use Tax, and such tax shall not be included as part of the bid.
10. **Contractor's Qualification Statement:** The Contractor's Qualification Statement must be filled out as part of the bid package and the experience and references listed therein will be one to the determining factors in the awarding of the bid.
11. **Hold Harmless Agreement:** In order for the bid to be considered valid, the Contractor **must** sign the enclosed hold harmless agreement. Bids submitted without the signed hold harmless agreement will be rejected.
12. **Prevailing Wage Rates:** This project **IS** subject to the State of Connecticut's prevailing wage rates.
13. **SBE/MBE and Contract Compliance Requirements:** This project **is not** subject to the State of Connecticut SBE/MBE set aside and contract compliance requirements.
14. **Time of Completion:** All work must be completed within **90 days** from receipt of the notice to proceed.
15. **Bonds:** A Performance bond is the full amount of the Proposal will be required of the successful bidder. The bond must be in the form of a surety bond of a type satisfactory to the Town of Ridgefield. All sureties must be listed on the most recent IRS Circular 570. The bond shall be delivered to the Office of the Facilities Director before commencing the work. A Bid Bond is not required.
16. **Project Locations:** The project is located at 115 Barlow Mountain Road, Ridgefield, CT 06877, in the Pool Building. All site visits shall be approved by the Town of Ridgefield prior to entry to the pool building.

17. **Bid Submissions:** The following items shall be submitted for a bid to be considered complete:
- (a) Bid Proposal Form, listed in bid document.
  - (b) Executed Hold Harmless Agreement
  - (c) Certificates of Insurance in conformance to Item 6 above
  - (d) Contractor's List of Subcontractor's (if none, state none)
  - (e) Contractor's Qualification Statement
18. **Project Site Inspection:** The Town will have a site inspection scheduled for Thursday, January 12, 2023 at 11:00 AM. It is recommended all prospective bidders attend, the Town will not schedule individual appointments.

**HOLD HARMLESS AGREEMENT**

The undersigned covenants and agrees to and shall at all times indemnify, protect and save harmless the Town of Ridgefield from and against all costs or expenses resulting from any and all losses, damages, detriments, claims, demands, cost and charges including attorneys fees the Town of Ridgefield may directly or indirectly suffer, sustain or be subjected to by reason or on account of the work to be performed pursuant to this Contract or any activities in connection with said Contract whether such losses and damages be suffered or sustained by the Town of Ridgefield directly or by its employees, licenses or invitees or be suffered or sustained by other persons or corporations who may seek to hold the Town of Ridgefield liable therefore.

The Contractor shall comply with the Provisions of the Immigration Reform and Control Act of 1986 effective and enforceable as of June 6, 1987 which Act makes unlawful the hiring for employment or subcontracting individuals failing to provide documentation of legal eligibility to work in the United States. The Contractor shall hold the Town of Ridgefield harmless for the failure of the Contractor to comply with the provisions of said Act.

IN WITNESS WHEREOF, the parties hereto have set their hand and seal this on the \_\_\_\_\_ day of \_\_\_\_\_

Signed, Sealed and Delivered in the  
Presence of:

Signed:

\_\_\_\_\_  
Notary Public

Purchasing Department, Town of Ridgefield, 400 Main Street, Ridgefield, CT 06877  
203-431-2720 & purchasing@ridgefieldct.org

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## APPENDIX - INSURANCE REQUIREMENTS

Each bidder shall carry and maintain the following insurance coverage during the period of the contract: The Certificate of Insurance for the Limits of Liability stated below should be submitted with your bid to the Purchasing Department at Town Hall. **Bidders may not perform any work until all insurance requirements are met.**

1. **Comprehensive General Liability Insurance** as will protect him, the Town, and any subcontractor performing work covered by this Contract, from claims for damages for personal injury, including accidental or wrongful death, as well as claims for property damages, which may arise from operations under this Contract whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them. Liability insurance shall include premises and operations, products, contractual, owners, and contractors protective. The minimum amounts of such insurance shall be as follows:
  - Bodily Injury Liability and Property Damage Liability:  
**\$1,000,000 each occurrence.**
  - **The Town shall be named as an Additional Insured**  
This **MUST** be stated explicitly on the Certificate or you will be **disqualified**
2. **Worker's Compensation Insurance and Employer's Liability** for all of his employees, employed at the site and in case any work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all employees of the later unless such employees are covered by the protection afforded by the Contractor.
  - Worker's Compensation and Employer Liability:  
Statutory Limits
3. **Comprehensive Auto Liability Insurance:**
  - **Bodily Injury Insurance and Property Damage Insurance** covering the operation of all Motor Vehicles owned, hired and/or non-owned by the Contractor, or used by the Contractor in the Prosecution of the work under the Contract, shall be in the minimum of **\$1,000,000 each occurrence.**

**CONTRACTOR'S QUALIFICATION STATEMENT**

List below references for similar projects, including all information requested. This page must be completed and submitted with the bid.

1. Client: \_\_\_\_\_

Project Address: \_\_\_\_\_

Approximate Value: \_\_\_\_\_ Date: Started \_\_\_\_\_ Completed \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

2. Client: \_\_\_\_\_

Project Address: \_\_\_\_\_

Approximate Value: \_\_\_\_\_ Date: Started \_\_\_\_\_ Completed \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

3. Client: \_\_\_\_\_

Project Address: \_\_\_\_\_

Approximate Value: \_\_\_\_\_ Date: Started \_\_\_\_\_ Completed \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

4. Client: \_\_\_\_\_

Project Address: \_\_\_\_\_

Approximate Value: \_\_\_\_\_ Date: Started \_\_\_\_\_ Completed \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

Company: \_\_\_\_\_ Bid Title: \_\_\_\_\_

Street: \_\_\_\_\_ Bid No.: \_\_\_\_\_

City, State: \_\_\_\_\_ Telephone No.: \_\_\_\_\_

**CONTRACTOR'S LIST OF SUBCONTRACTORS**

List below the subcontractors intended to be utilized for this project. This page must be completed and submitted with the bid.

1. Firm: \_\_\_\_\_

Firm's Address: \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

Type of Work to be Performed: \_\_\_\_\_

2. Firm: \_\_\_\_\_

Firm's Address: \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

Type of Work to be Performed: \_\_\_\_\_

3. Firm: \_\_\_\_\_

Firm's Address: \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

Type of Work to be Performed: \_\_\_\_\_

4. Firm: \_\_\_\_\_

Firm's Address: \_\_\_\_\_

Contact: Name \_\_\_\_\_ Telephone \_\_\_\_\_

Type of Work to be Performed: \_\_\_\_\_

Company: \_\_\_\_\_ Bid Title: \_\_\_\_\_

Street: \_\_\_\_\_ Bid No.: \_\_\_\_\_

City, State: \_\_\_\_\_ Telephone No.: \_\_\_\_\_



# PROPOSAL

Proposal of: \_\_\_\_\_  
to furnish and deliver all materials and to do and perform all works in accordance  
with the Contract Documents for **Barlow Mountain Pool HVAC Replacement**,  
depicted in the plans and specifications prepared by Southport Engineering  
Associates, P.C., the works being situated within the Town of Ridgefield,  
Connecticut.

The undersigned bidder has carefully examined the Contract Documents referred to in the "Information for Bidders", and also the site of the work, and will provide all necessary labor, machinery, tools, apparatus, and other means of construction, and do all the work and furnish all material called for by the Contract Documents in the manner prescribed therein and in said Contract, and in accordance with the requirements of the Engineer under them for the following sums:

**Barlow Mountain Pool HVAC Replacement**  
the lump sum price of:

dollars

and \_\_\_\_\_ cents

Lump Sum    LS                      \$ \_\_\_\_\_

**SPECIMEN CONTRACT**

This Agreement made as of the \_\_\_\_\_ day of \_\_\_\_\_  
the year \_\_\_\_\_ by and between the Town of Ridgefield, 400 Main  
Street, Ridgefield, Connecticut, (herein after called the Owner), and  
\_\_\_\_\_, doing business at  
\_\_\_\_\_, (herein after called the  
Contractor).

Witnesseth that the Owner and the Contractor in consideration of the mutual  
covenants herein after set forth, agree as follows:

**Article 1. Work:**

The contractor will perform all work as shown in the Contract Documents for the  
completion of the Project generally described as follows:

**Sidewalk and Curbing Improvements**

The work to be done consists of the furnishing of all labor, materials, tools, and  
equipment necessary to construct the project as shown on the plans and as  
described in the specifications prepared by Jacob Muller, Director of Facilities.

**Article 2. Engineer:**

Jacob Muller, Director of Facilities, will act as the Engineer in connection with  
completion of the Project in accordance with the Contract Documents.

**Article 3. Contract Time:**

The work shall be completed within **one hundred (100) calendar days** after  
the date which the Contractor is to start the work as provided in the Contract  
Documents.

**Article 4. Contract Price:**

The Owner will pay the Contractor for performance of the Work and completion of the Project in accordance with the Contract Documents subject to adjustment by modifications as provided therein in current funds as follows:

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**Article 5. Progress and Final Payments:**

The Owner will make progress payments on account of the Contract Price as provided in the General Conditions. Progress and final payments will be on the basis of the Contractor's application for payment as approved by the Engineer.

**Article 6. Contract Documents:**

The Contract Documents which comprise the contract between the Owner and the Contractor are attached hereto and made a part hereof and consist of the following:

- A. This agreement
- B. Exhibits to this Agreement
- C. Contractor's Bid and Bid Bonds
- D. Specifications
- E. Drawings as referenced by the Specifications or attached hereto
- F. Addenda numbers: \_\_\_\_\_
- G. Any modifications, including change orders, duly delivered after execution of this agreement.

**Article 7. Miscellaneous:**

- A. Terms used in this Agreement which are defined in Article 1 of the General Conditions shall have the meanings indicated in the General Conditions.

- B. Neither the Owner nor the Contractor shall, without the prior written consent of the other, assign or sublet in whole or in part his interest under any of the Contract Documents and, specifically, the Contractor shall not assign any moneys due or to become due without the prior written consent of the Owner.
- C. The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto in respect of all covenants, agreements and obligations contained in the Contract Documents.
- D. The Contract Documents constitute the entire agreement between the Owner and the Contractor and may only be altered, amended or repealed by a duly executed written instrument.

In witness whereof, the said parties hereto have caused this instrument to be signed by their respective duly constituted officers, attested, and sealed pursuant to proper resolutions.

Signed and sealed in  
the presence of:

\_\_\_\_\_  
Town of Ridgefield

By \_\_\_\_\_

Date \_\_\_\_\_

\_\_\_\_\_  
Contractor

By \_\_\_\_\_

Date \_\_\_\_\_



GENERAL DRAWING ABBREVIATIONS AND SYMBOLS			
W/	WITH	W/O	WITHOUT
TYP	TYPICAL	NIC	NOT IN CONTRACT
E	EXISTING	KW	KILOWATT
AD	ACCESS DOOR	HP	HORSEPOWER
AWF	ABOVE FINISH FLOOR	BHP	BRAKE HORSE POWER
DWG	DRAWING	VSD	VARIABLE SPEED DRIVE
DN	DOWN	ODP	OPEN DRIP PROOF
N	NEW	TEFC	TOTALLY ENCLOSED FAN-COOLED
—	NEW WORK		
—	EXISTING TO REMAIN		
—X—	TO BE DEMOLISHED		
	POINT OF NEW CONNECTION TO EXISTING		
	POINT OF DISCONNECTION		
	DRAWING NOTE		
	REVISION SYMBOL		
	SECTION DRAWING SYMBOL		
	CONTINUATION SYMBOL		
	SQUARE FOOT		

HVAC PIPING ABBREVIATIONS AND SYMBOLS			
CHWS(R)	CHILLED WATER SUPPLY (RETURN)	HWS(R)	HEATING WATER SUPPLY (RETURN)
CWS(R)	CONDENSER WATER SUPPLY (RETURN)	CW	CITY WATER
DR	DRAIN	PD	PUMP DISCHARGE
BP	BACKFLOW PREVENTOR	PS	PRESSURE SWITCH
GPM	GALLONS/MINUTE	FS	FLOW SWITCH
	BALL VALVE		ELECTRIC ACTUATOR
	BUTTERFLY VALVE		SOLENOID ACTUATOR
	PLUG VALVE		PNEUMATIC ACTUATOR
	GATE VALVE		CONCENTRIC REDUCER
	GLOBE VALVE		ECCENTRIC REDUCER
	BALANCING VALVE		FLOW LIMITING VALVE
	PRESSURE REDUCING VALVE		PUMP
	SAFETY RELIEF VALVE		PRESSURE GAUGE
	CHECK VALVE		THERMOMETER
	STRAINER W/ BLOWDOWN VALVE		MANUAL AIR VENT (A=AUTO VENT)
	TRIPLE-DUTY VALVE		THERMOWELL
	3-WAY VALVE		PIPE ANCHOR
	UNION		PIPE GUIDE
	FLEXIBLE CONNECTION		EXPANSION JOINT
	ELBOW DOWN		ELBOW UP
	BOTTOM CONNECTION		TOP CONNECTION
	CONTROL VALVE & TRIM		PIPE PITCHED DOWN 1 IN DIRECTION OF ARROW. NUMBER INDICATES INCHES OF PITCH PER FOOT (WHEN SHOWN).

MECHANICAL DRAWING LIST		
M-100	-	MECHANICAL SPECIFICATIONS AND LEGEND
M-101	-	MECHANICAL SPECIFICATIONS (CONTINUED)
M-200	-	MECHANICAL DEMOLITION PLAN
M-300	-	MECHANICAL CONSTRUCTION PLAN
M-400	-	MECHANICAL SCHEDULES AND DETAILS
M-401	-	MECHANICAL DETAILS CONTINUED
M-500	-	MECHANICAL CONTROLS

HVAC DUCTWORK ABBREVIATIONS AND SYMBOLS			
OA	OUTSIDE AIR	FD	FIRE DAMPER
SA	SUPPLY AIR	FSD	FIRE/SMOKE DAMPER
RA	RETURN AIR	BDD	BACKDRAFT DAMPER
EA	EXHAUST AIR	AD	ACCESS DOOR
TA	TRANSFER AIR	WMS	WIRE MESH SCREEN
CFM	CUBIC FEET/MINUTE	FC	FLEXIBLE CONNECTION
(100)	AIR FLOW-CFM	AL	ACOUSTICAL LINING
Ø	ROUND DIAMETER	OBD	OPPOSED BLADE DAMPER
CD	CEILING DIFFUSER	RG	RETURN GRILLE
LD	LINEAR DIFFUSER	OAI	OUTSIDE AIR INTAKE
TS	TEMPERATURE SENSOR	FA	NET FREE AREA
RR	REMOVE & RELOCATE	ETR	EXISTING TO REMAIN

SINGLE LINE SYMBOL	DOUBLE LINE SYMBOL	
		NEW DUCT - FIRST DIMENSION IS TOP SIZE (CLEAR INSIDE DIMENSION, INCHES)
		INTERNALLY LINED DUCT (ALSO REFER TO SPECIFICATIONS)
		FLEXIBLE DUCT (8 INCH DIAMETER)
		DUCT UP (RETURN SHOWN)
		DUCT DOWN (RETURN SHOWN)
		MITERED ELBOW (W/ TURNING VANES)
		RADIUS ELBOW
		BRANCH TAKE-OFF (45 DEGREES)
		RADIUS TAKE-OFF

SUPPLY/INTAKE SYMBOLS		RETURN/EXHAUST SYMBOLS	
	DUCT		DUCT
	AIRFLOW DIRECTION		AIRFLOW DIRECTION
	CEILING DIFFUSER		CEILING GRILLE
	LINEAR DIFFUSER		LINEAR RETURN
OTHER SYMBOLS			
	DIFFUSER THROW (NO AIRFLOW IN SHADED DIRECTION)		
	MANUAL VOLUME DAMPER		FIRE & SMOKE FIRE=FD FIRE/SMOKE=FSD SMOKE=SMD
	SPLITTER DAMPER		
	VAV BOX		DUCT SMOKE DETECTOR
	DUCT COIL		THERMOSTAT/SENSOR
	FLEXIBLE CONNECTION		CARBON DIOXIDE SENSOR
	RECTANGULAR TO ROUND TRANSITION		DUCT RISE (R) OR DROP (D) IN DIRECTION OF ARROW. NUMBER INDICATES INCHES OF RISE/DROP (WHEN SHOWN).

## MECHANICAL SPECIFICATION

### 1.0 GENERAL

#### 1.1 SCOPE OF WORK

A. THE WORK UNDER THIS SECTION OF THE SPECIFICATIONS INCLUDES ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES FOR AIR HANDLING SYSTEMS, REPLACEMENT AND CONTROLS UPGRADE AND OTHER WORK AS SHOWN ON THE CONTRACT DRAWINGS. WORK SHALL BE IN ACCORDANCE WITH THESE SPECIFICATIONS AND THE CONTRACT DRAWINGS AND SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT. THE WORK IN GENERAL CONSISTS OF, BUT IS NOT LIMITED TO, THE FOLLOWING:

- DEMOLITION OF ONE (1) EXISTING AIR HANDLING SYSTEM.
- INSTALLATION OF NEW SPLIT POOL AIR HANDLING SYSTEM.
- INSTALLATION OF IN-LINE FANS.
- DUCTWORK, PIPING, INSULATION AND ASSOCIATED WORK.
- DOC CONTROL SYSTEMS.
- INSTALLATION OF DUCT SMOKE DETECTORS AND ASSOCIATED FIRE ALARM WORK
- COORDINATION WITH OTHER TRADES
- AIR AND WATER BALANCING
- RECORD AS-BUILT DRAWINGS AND OPERATING AND MAINTENANCE MANUALS FOR EQUIPMENT PROVIDED BY THIS CONTRACTOR.
- CONTROLS

THE MECHANICAL CONTRACTOR SHALL RETAIN THE SERVICES OF A TEMPERATURE CONTROL SYSTEM SUBCONTRACTOR FOR INSTALLATION OF DDC CONTROL SYSTEM. REFER TO DRAWING M-500 FOR CONTROLS SPECIFICATIONS.

#### 11. ELECTRICAL WORK

SUBCONTRACT WITH ELECTRICAL CONTRACTOR TO PROVIDE ALL REQUIRED WIRING TO COMPLETE THE CONTROLS SCOPE OF WORK. REFER TO ELECTRICAL DRAWINGS.

### 1.2 BIDDING

- CONTRACTOR SHALL VISIT THE JOB AND FULLY FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS PRIOR TO SUBMISSION OF BIDS.
- CONTRACTOR SHALL COORDINATE THE REQUIREMENTS OF ANY AND ALL DRAWINGS INCLUDING MECHANICAL, ELECTRICAL AND CONTROLS. ANY CONFLICT SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER DURING THE BIDDING PERIOD.
- CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION TO DETERMINE THE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY THE BUILDING.

### 1.3 GENERAL REQUIREMENTS

- ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL BUILDING CODES AND OTHER AUTHORITIES HAVING JURISDICTION.
- CONTRACTOR SHALL PAY ALL FEES AND TAXES, OBTAIN ALL PERMITS AND APPROVALS, FILE THE REQUIRED DOCUMENTS. SCHEDULE AND PAY ALL FEES FOR ALL BUILDING AND FIRE DEPARTMENT INSPECTIONS, INCLUDING SPECIAL INSPECTIONS, CONTROLLED INSPECTIONS AND FINAL SIGN-OFF INSPECTIONS.
- THE CONTRACTOR SHALL WARRANTY ALL WORK FOR A PERIOD OF 12 MONTHS FROM ACCEPTANCE BY OWNER. DURING THIS WARRANTY PERIOD, CONTRACTOR SHALL RESPOND TO ALL CALLS FOR SERVICE, REPAIRS AND ADJUSTMENTS REQUIRED BY OWNER. CONTRACTOR SHALL INSTALL REPLACEMENT PARTS AND MATERIAL REQUIRED AT NO COST TO THE OWNER. ALL EQUIPMENT WARRANTIES SHALL BE TRANSFERRED TO OWNER AND SERVICED BY CONTRACTOR AS PART OF THIS CONTRACT.
- CONTRACTOR SHALL COORDINATE WITH OTHER CONTRACTORS INCLUDING, ELECTRICAL, PLUMBING, FIRE PROTECTION, CONTROLS AND GENERAL CONTRACTOR. CONTRACTOR SHALL PARTICIPATE IN DEVELOPMENT OF COORDINATED SHOP DRAWINGS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ANY WALL OR FLOOR PENETRATIONS FOR NEW DUCT OR PIPING WHICH SHALL BE PATCH AND REPAIR, TO MATCH EXISTING, ALL HOLES, ACCESS OPENINGS, ETC. DUE TO NEW WORK AND DEMOLITION WORK. ALL PENETRATIONS SHALL BE PATCHED AND RE-STOPPED AS REQUIRED TO MAINTAIN THE INTENDED FIRE RATING. UNLESS NOTED OTHERWISE ALL EXISTING FLOORS AND MECHANICAL ROOM WALLS SHALL BE CONSIDERED TO BE 2-HOUR RATED.
- CONTRACTOR SHALL INFORM ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ASBESTOS OR OTHER HAZARDOUS MATERIAL THAT WILL BE DISTURBED DUE TO THIS WORK.
- DEMOLITION AND OTHER WORK WHICH MAY CREATE A DISTURBANCE MUST BE COORDINATED WITH THE OWNER. THE DELIVERY, HANDLING AND INSTALLATION OF MATERIALS, EQUIPMENT AND REMOVAL OF DEBRIS MUST BE ARRANGED TO AVOID ANY INCONVENIENCE AND ANNOYANCE TO OWNER. THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLITION AND UNUSED MATERIALS.
- THOROUGHLY BRUSH AND CLEAN UP WORK AT THE END OF EACH DAY. REMOVE ALL DEBRIS FROM INSIDE AND OUTSIDE OF ALL DUCTWORK, PIPING AND EQUIPMENT. PAINTED EXPOSED WORK, SOILED OR DAMAGED, SHALL BE CLEANED OR REPAINTED TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE.

- SUBSTITUTIONS FOR THE SPECIFIED EQUIPMENT SHALL NOT BE PERMITTED WITHOUT APPROVAL FROM THE ENGINEER. THE ASSOCIATED CHANGE IN THE CONTRACT PRICE SHALL BE INCLUDED WITH ANY PROPOSED SUBSTITUTIONS.

- SEISMIC MOUNTING AND BRACING OF ALL EQUIPMENT, PIPING ETC. SHALL BE IN ACCORDANCE WITH STATE AND LOCAL REQUIREMENTS. THE SEISMIC REQUIREMENTS SHALL BE BASED ON A USE TYPE [2A]

- THE CONTRACTOR SHALL COORDINATE WITH EQUIPMENT MANUFACTURER'S SERVICE REPRESENTATIVE TO ENSURE PROPER INSTALLATION, PIPING AND SERVICE CLEARANCE REQUIREMENTS ARE MET.

- LAYOUT SYSTEMS TO MAINTAIN ACCESS AND SERVICE CLEARANCES FOR INSTALLED EQUIPMENT, VALVES, CONTROLS, VOLUME DAMPERS, FIRE/SMOKE DAMPERS AND ALL COMPONENTS REQUIRING ACCESS. SERVICE ACCESS SHALL BE AS RECOMMENDED BY MANUFACTURER OR AS REQUIRED BY CODE WHICHEVER IS GREATER.

- MAINTAIN OPERATION OF BUILDING SYSTEMS DURING CONSTRUCTION. ANY REQUIRED SHUTDOWNS OF BUILDING SYSTEMS MUST BE COORDINATED WITH THE OWNER. SYSTEMS TO BE REMAIN OPERATIONAL INCLUDE: CHILLED WATER, AND STEAM.

- UNLESS OTHERWISE SPECIFIED, THE MOST RECENT VERSIONS OF THE FOLLOWING CODES AND STANDARDS APPLY AND ARE MADE A PART OF THIS SPECIFICATION

- STATE OF CONNECTICUT BUILDING CODES
- UNDERWRITER'S LABORATORIES, INC. (UL).
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
- AMERICAN NATIONAL STANDARD INSTITUTE (ANSI).
- OSHA - FEDERAL STANDARDS
- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS, INC. (ASHRAE).
- AIR CONDITIONING & REFRIGERATION INSTITUTE (ARI).
- AMERICAN WELDING SOCIETY (AWS).
- AMERICAN SOCIETY OF TESTING AND MATERIALS (ASTM).

- PATCH, FILL AND REPAIR, INCLUDING PAINTING OR RECOVERING ALL SURFACES DISTURBED, CUT, DAMAGED, IN NEED OF REPAIR OR MADE IMPERFECT BY ALTERATIONS OR REMOVAL WORK AND AS REQUIRED.

- THE CONTRACTOR SHALL DISPOSE OF ALL DEMOLITION AND UNUSED MATERIALS.

- DEMOLITION AND OTHER WORK WHICH MAY CREATE A DISTURBANCE MUST BE COORDINATED WITH THE OWNER. THE DELIVERY, HANDLING AND INSTALLATION OF MATERIALS, EQUIPMENT AND REMOVAL OF DEBRIS MUST BE ARRANGED TO AVOID ANY INCONVENIENCE AND ANNOYANCE TO OWNER.

### 1.4 COORDINATION WITH BUILDING MANAGEMENT

- THIS CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE BUILDING OWNER'S RULES AND REGULATIONS. ANY DISCREPANCIES BETWEEN THE CONTRACTOR DOCUMENTS AND THE BUILDING RULES AND REGULATIONS SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT/ENGINEER FOR REVIEW, WITH BID SUBMISSION.

- COORDINATE WITH BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS OR A MINIMUM OF TWO (2) DAYS PRIOR TO ANY WORK, WHICHEVER IS MORE STRINGENT. CONTRACTOR IS TO PERFORM WORK N PREMIUM TIME, IF SO DIRECTED BY BUILDING OWNER, SO AS NOT TO INTERRUPT BUILDING SERVICES DURING OCCUPIED PERIODS.

### 1.5 SUBMITTALS

- SHOP DRAWINGS OF THE FOLLOWING SHALL BE SUBMITTED FOR REVIEW PRIOR TO PURCHASE AND INSTALLATION.

- MANUFACTURER'S SUBMITTAL DATA FOR ALL EQUIPMENT. SUPPLIER SUBMITTALS SHALL CLEARLY INDICATE SPECIFIC ITEMS PROPOSED AND WHERE EACH ITEM IS TO BE APPLIED.
- EQUIPMENT SOUND POWER DATA BROKEN INTO OCTAVE BANDS.
- DIMENSIONED AND DETAILED PIPING, EQUIPMENT AND DUCTWORK LAYOUT AT 3/8" = 1'-0" SCALE, MINIMUM.
- SHOP STANDARDS AND INSTALLATION DETAILS FOR DUCTWORK, PIPING, INSULATION, STRUCTURAL SUPPORTS, VIBRATION ISOLATION, AND SEISMIC SUPPORT.
- PIPE CLEANING AND FLUSHING PROCEDURE.
- AIR AND WATER BALANCING REPORTS.
- OTHER SUBMITTAL DATA NOTED ELSEWHERE.

- SUBMITTAL QUANTITIES AND METHODS SHALL BE AS OUTLINED IN THE GENERAL PROVISIONS OF THE CONTRACT DOCUMENTS AS APPLICABLE. OTHERWISE A MINIMUM OF TWO HARD COPIES AND ONE "PDF" COPY SHALL BE SUBMITTED.
- SUBMIT DETAILED PROJECT SCHEDULE, WITHIN TWO (2) WEEKS OF CONTRACT AWARD.

### 1.6 RECORD DRAWINGS

- MAINTENANCE MANUALS, AS-BUILT DRAWINGS SHOWING ALL DUCTWORK, PIPING AND EQUIPMENT AND TEST AND BALANCING REPORTS SHALL BE SUBMITTED TO THE OWNER AT THE COMPLETION OF THE WORK. THE AS-BUILT DRAWINGS SHALL ALSO SHOW EXISTING WORK WITHIN THE WORK AREA INCLUDING DUCTS AND PIPING THAT WAS CAPPED, REROUTED AND REMAINING IN WORK AREA.

### 2.0 DUCTWORK MATERIALS AND INSTALLATIONS

#### 2.1 DUCTWORK

- ALL DUCTWORK SHALL BE STAINLESS OR ALUMINUM. ALL DUCTWORK SHALL CONFORM TO THE CONSTRUCTION DETAILS AND RECOMMENDATIONS IN THE LATEST ISSUES OF THE ASHRAE GUIDE, NFPA BULLETINS 90A, B & C AND THE SMACNA DUCT MANUAL. INSTALLATION OF DUCTWORK SHALL BE AS RECOMMENDED BY THE ABOVE. ALL DUCT SEAMS SHALL BE SEALED WITH DUCT SEALANT. DUCT LEAKAGE SHALL NOT EXCEED VALUES SET BY THE SMACNA STANDARDS, AND RECOMMENDATIONS BY ASHRAE, AND IN NO CASE SHALL BE MORE THAN 5 PERCENT.
- PRESSURE CLASSIFICATIONS SHALL BE MINIMUM OF 2" W.G. EXCEPT AS INDICATED BELOW AND AS INDICATED ON DRAWINGS. ALL SYSTEM COMPONENTS SHALL BE SELECTED AND INSTALLED TO ACHIEVE THE PRESSURE RATINGS.

SERVICE	PRESSURE RATING
ALL OTHER DUCTWORK	2" IN. W.G.

- THE CONTRACTOR SHALL PROVIDE BALANCING DAMPERS, AS SHOWN ON THE PLANS AND AS REQUIRED TO ACHIEVE SPECIFIED AIR FLOW.

- ALL 90 DEGREE MITER ELBOWS SHALL HAVE DOUBLE THICKNESS AIR FOIL TYPE TURNING VANES AS DETAILED IN THE SMACNA STANDARDS. ALL OTHER ELBOWS SHALL HAVE A MINIMUM TURNING RADIUS OF ONE DUCT WIDTH AS MEASURED FROM THE CENTER LINE. ALL DUCT SUPPORTS SHALL CONFORM TO SMACNA STANDARDS.

### 2.2 AUTOMATIC DAMPERS

- PROVIDE AUTOMATIC DAMPERS AS INDICATED ON CONTRACT DRAWINGS.

- DAMPERS TO BE LOW LEAKAGE TYPE, WITH PUBLISHED LEAKAGE DATA CERTIFIED UNDER THE AMCA CERTIFIED RATING PROGRAM SHOWING LEAKAGE THOUGH A 48 INCH BY 48 INCH DAMPER AT A 4 INCH WATER GAUGE PRESSURE DIFFERENCE TO BE LESS THAN 10 CFM PER SQUARE FOOT.

- AUTOMATIC DAMPERS SHALL BE THE PARALLEL OR OPPOSED BLADE TYPE AS SPECIFIED BELOW OR AS NOTED ON THE DRAWINGS.

- MODULATING DAMPERS SHALL BE OPPOSED BLADE CONFIGURATION.
- TWO-POSITION SHUTOFF DAMPERS MAY BE PARALLEL OR OPPOSED BLADE.

- DAMPER FRAMES SHALL BE 13 GAUGE GALVANIZED STEEL CHANNEL OR 1/8 INCH EXTRUDED ALUMINUM WITH REINFORCED CORNER BRACING. DAMPER BLADES SHALL BE NOT LESS THAN 16 GAUGE.

- DAMPERS TO HAVE A MAXIMUM BLADE LENGTH OF 48 INCHES AND A MAXIMUM BLADE WIDTH OF 8 INCHES. THE MAXIMUM HEIGHT OF EACH DAMPER SECTION SHALL BE 72 INCHES. WHERE GREATER LENGTH OR HEIGHT IS REQUIRED, USE MULTIPLE DAMPER SECTIONS. DAMPERS TO HAVE EXTERNAL SHAFT TYPE UNLESS NOTED OR APPROVED OTHERWISE. DAMPERS SHALL HAVE EXPLOSED LINKAGES.

- DAMPER SHAFT BEARINGS SHALL BE AS RECOMMENDED BY THE MANUFACTURER FOR THE APPLICATION, OIL IMPREGNATED SINTERED BRONZE OR BETTER.

- ALL BLADE EDGES AND TOP AND BOTTOM OF THE FRAME SHALL BE PROVIDED WITH REPLACEMENT BUTYL RUBBER OR NEOPRENE SEALS. SIDE SEALS SHALL BE SPRING LOADED STAINLESS STEEL. BLADES AND SEALS SHALL BE SUITABLE FOR WIDE OPEN FACE VELOCITY OF UP TO 2000 FPM.

- INSTALL DAMPER ACTUATORS OF SUFFICIENT QUANTITY AND SIZE TO LIMIT LEAKAGE TO SPECIFIED RATE AND BE SUITABLE FOR DESIGN FLOW AND PRESSURE CONDITIONS. DAMPER ASSEMBLIES CONSISTING OF MULTIPLE DAMPER SECTIONS TO BE PROVIDED WITH AT LEAST ONE DAMPER ACTUATOR PER SECTION OR BE CONNECTED WITH AN APPROVED JACK SHAFTHING ARRANGEMENT.

### 2.3 FIRE DAMPERS

- FIRE DAMPERS SHALL BE UL 555, 1-1/2" HR RATED, AIRFOIL BLADE RUSKIN FD-60 OR APPROVED EQUAL, 120VAC ELECTRIC ACTUATOR. LOCATE ACTUATOR TO MAINTAIN 24" MINIMUM ACCESS. USE OUT OF WALL TYPE AS SHOWN ON PLANS OR REQUIRED FOR ACCESS.

### 2.4 DUCT AND AIR SYSTEMS INSULATION

- DUCTWORK INSULATION SHALL CONFORM TO MAXIMUM FLAME SPREAD/SMOKE DEVELOPMENT/FUEL CONTRIBUTION RATINGS OF 25 FLAME SPREAD, 50 SMOKE DEVELOPED AND 50 FUEL CONTRIBUTED IN ACCORDANCE WITH ASTM E84, WITH "K" VALUE OF 0.29 AT 75 DEGREES F. INSULATION SHALL PROVIDE CONTINUOUS, VAPOR BARRIER AND JOINTS SHALL BE SECURED WITH PRESSURE SENSITIVE TAPE. MOISTURE VAPOR TRANSMISSION PER ASTM E96, 1.3 PERM. MINIMUM DUCTWORK INSULATION R VALUES SHALL BE AS FOLLOWS:

- DUCT AND PLENUM INSULATION SCHEDULE:

SERVICE	INSTALLED THICKNESS - R-VALUE	WITHIN BLDG.	OUTDOORS AND UNCOND. AREA	BLDG ENVELOPE	ASSEMBLY
CONDITIONED SUPPLY	2" - R6	3"	R8		
CONDITIONED RETURN	2" - R6	3"	R8		
OUTSIDE AIR	2" - R6	3"	R8		

- DUCTS AND PLENUMS IN EXPOSED LOCATIONS: 3.0 LBS/CF DENSITY, RIGID GLASS FIBER BOARD INSTALLED ON EXTERIOR OF DUCTS AND PLENUMS: OUTSIDE AIR DUCTS AND PLENUMS, MIXED AIR PLENUMS, AND SUPPLY DUCTS WITHIN MECHANICAL ROOMS AND OTHER EXPOSED LOCATIONS.

- DUCTS AND PLENUMS IN CONCEALED (ACCESSIBLE) LOCATIONS: 1.5 LBS/CF DENSITY, FLEXIBLE GLASS FIBER WRAP.

- SCHEDULE - ACOUSTICAL LINING

SERVICE	THICKNESS	DISTANCE- FEET
UPSTREAM AND DOWNSTREAM	1"	20
NEW UNITS. SEE NOTE D.		

- PROVIDE 1", 1-1/2 LBS/CF, INTERNAL RIGID DUCT LINER FOR A MINIMUM OF 15 FEET UPSTREAM OF NEW UNITS AND OTHER LOCATIONS WHERE INDICATED ON

THE DRAWINGS UNLESS OTHERWISE INDICATED ON DRAWINGS. PROVIDE EXTERNAL INSULATION TO MAINTAIN R-VALUE. AP/COLLIFLEX FIBER FREE WITH ANTIMICROBIAL PROTECTION.

- NEW KITCHEN HOOD EXHAUST DUCT SHALL BE INSULATED WITH PYROSCAT FIRE RESISTIVE DUCT WRAP OR APPROVED EQUAL. THE WRAP SHALL PROVIDE A 4 HOUR UL RATED FIRE RESISTIVE WRAP. THE WRAP SHALL BE A FLEXIBLE, LIGHTWEIGHT, NON-ASBESTOS, INORGANIC, HIGH TEMPERATURE CERAMIC FIBER OR SPECIALTY GLASS FIBER DUCT WRAP DESIGNED TO PROVIDE TWO HOUR FIRE RATING PROTECTION AND ZERO CLEARANCE TO COMBUSTIBLE MATERIALS FOR GREASE AND AIR DUCTS. THE INSULATION SHALL COMPLY WITH THE PERFORMANCE REQUIREMENTS FOR A TWO HOUR RATE ASSEMBLY IN ACCORDANCE WITH ASTM E-119 AND NON-COMBUSTIBILITY IN ACCORDANCE WITH ASTM E-136. INSULATION MATERIALS SHALL BE RATED FOR FLAME SPREAD AND SMOKE DEVELOPED RATING OF 0 AND SHALL BE SUITABLE FOR A TEMPERATURE RANGE OF -300F TO 2300F. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

- INSULATION SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SMACNA GUIDELINES.

### 2.5 AIR SYSTEM - VIBRATION ISOLATION

- PROVIDE VIBRATION ISOLATION FOR ALL FANS WHERE NOT INTERNALLY ISOLATED.

- WHERE FANS ARE NOT PROVIDED WITH INTERNALLY ISOLATED FANS -APROVIDE NEOPRENE FLEXIBLE CONNECTIONS IN DUCTWORK AT FAN CONNECTIONS TO DUCTWORK.

- NEW FCU'S SHALL BE SET ON NEOPRENE VIBRATION ISOLATION PADS.

### 3.0 PIPING MATERIALS AND INSTALLATION

#### 3.1 GENERAL

- PRESSURE RATINGS FOR PRESSURIZED PIPING SHALL BE 150 PSI AND AS NOTED ON THE DRAWINGS. ALL SYSTEM MATERIALS AND COMPONENTS SHALL BE SELECTED AND INSTALLED TO ACHIEVE THE PRESSURE RATINGS

#### 3.2 PIPE AND FITTINGS

- PROVIDE PIPING AS INDICATED ON SCHEDULE BELOW AND INDICATED ON DRAWINGS.

SERVICE	PIPE	JOINTS
CWS&R, HWS&R - UP TO 2 IN.	TYPE L COPPER	
CWS&R, HWS&R - 2-1/2" AND UP	SCH 40 STEEL	
POOL HEATING (HWS&R) UP TO 2 IN.	SCH 78 CPVC	
AC CONDENSATE	TYPE M COPPER	SWEAT

- COPPER PIPING: WROUGHT COPPER FITTINGS. SWEAT JOINTS 95-5 TIN ANTIMONY SOLDER JOINTS.
- STEEL PIPING: ASTM 53 SCHEDULE 40 SEAMLESS STEEL, SCHEDULE 80 SEAMLESS STEEL. FITTINGS SHALL BE ANSI/ASTM B16.3 MALLEABLE IRON CLASS 125, OR ASTM B234, FORGED STEEL CLASS 125. ALL JOINTS FOR PIPING 2" AND LESS TO BE SCREWED AND PIPING 2-1/2" AND LARGER SHALL BE WELDED OR FLANGED. REDUCER FITTINGS SHALL BE ECCENTRIC TYPE. ALL TURNS AND BRANCHES IN PIPING SHALL BE MADE USING FITTINGS EXCEPT WELDOLETS MAY BE USED WHEN THE SIZE OF THE BRANCH PIPING IS 1/2 THE SIZE OR LESS OF THE MAIN BRANCH.

- JOINTS: SCREWED FOR PIPE 2 INCH AND UNDER; ANSI/AWS D1.1 WELDED FOR PIPE OVER 2 INCH.

- FLANGES, UNIONS, AND COUPLINGS: PIPE SIZE 2 INCHES AND UNDER: SERVICE 150 PSI WORKING PRESSURE MALLEABLE IRON UNIONS FOR
- THREADED FERROUS PIPING; BRONZE UNIONS FOR COPPER PIPE, SOLDERED JOINTS. PIPE SIZE OVER 2 INCHES: SERVICE 150 PSI WORKING PRESSURE FORGED STEEL SLIP-ON FLANGES FOR FERROUS PIPING.

- PLASTIC PIPE AND FITTING:
  - CPVC PLASTIC PIPE: ASTM F 441/F 441M, WITH WALL THICKNESS AS INDICATED IN "PIPING APPLICATIONS" ARTICLE.
  - CPVC PLASTIC PIPE FITTINGS: SOCKET-TYPE PIPE FITTINGS, ASTM F 439 FOR SCHEDULE 40 PIPE.
  - JOINING MATERIALS:
    - 3.1 PLASTIC, PIPE-FLANGE GASKET, BOLTS, AND NUTS: TYPE AND MATERIAL RECOMMENDED BY PIPING SYSTEM MANUFACTURER UNLESS OTHERWISE INDICATED.
    - 3.2 SOLVENT CEMENTS FOR JOINING PLASTIC PIPING: CPVC PIPING: ASTM F 493.
    - 3.3 CPVC SOLVENT CEMENT SHALL HAVE A VOC CONTENT OF 490 G/L OR LESS.
    - 3.4 ADHESIVE PRIMER SHALL HAVE A VOC CONTENT OF 550 G/L OR LESS.
  - 3.5 SOLVENT CEMENT AND ADHESIVE PRIMER SHALL COMPLY WITH THE TESTING AND PRODUCT REQUIREMENTS OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S (FORMERLY, THE CALIFORNIA HEALTH SERVICES') "STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC CHEMICAL EMISSIONS FROM INDOOR SOURCES USING ENVIRONMENTAL CHAMBERS."

- GASKET MATERIAL: THICKNESS, MATERIAL, AND TYPE SUITABLE FOR FLUID TO BE HANDLED AND WORKING TEMPERATURES AND PRESSURES.
- TRANSITION FITTINGS: PLASTIC-TO-METAL TRANSITION UNIONS: BRASS OR COPPER END, SOLVENT-CEMENT-JOINT END OF MATERIAL AND WALL THICKNESS TO MATCH PLASTIC PIPE MATERIAL, RUBBER GASKET, AND THREADED UNION.

#### 1. VICTAULIC:

- ALL GROOVED COMPONENTS (COUPLINGS, FITTINGS, VALVES, GASKETS, BOLTS, NUTS) SHALL BE OF ONE MANUFACTURER (VICTAULIC COMPANY). GROOVING TOOLS SHALL BE OF



MECHANICAL SPECIFICATION – CONTINUED

3.3 VALVES AND PIPING SPECIALTIES

- C. ALL VALVES SHALL BE OF A DESIGN WHICH THE MANUFACTURER LISTS FOR THE SERVICE AND SHALL BE OF MATERIALS ALLOWED BY THE LATEST EDITION OF THE ASME CODE FOR PRESSURE PIPING, FOR THE MAXIMUM OPERATING PRESSURE AND TEMPERATURE, UNLESS A HIGHER GRADE OR QUALITY IS HEREIN SPECIFIED. ALL VALVES SHALL BE OF THE SAME MANUFACTURER, EXCEPT FOR SPECIAL APPLICATIONS.
- D. EACH VALVE SHALL HAVE THE MAKER'S NAME OR BRAND, THE FIGURE OR LIST NUMBER AND THE GUARANTEED WORKING PRESSURE CAST ON THE BODY AND CAST OR STAMPED ON THE BONNET, OR SHALL BE PROVIDED WITH OTHER MEANS OF EASY IDENTIFICATION.
- E. PROVIDE VALVES AS INDICATED ON SCHEDULE BELOW AND INDICATED ON DRAWINGS.

SERVICE	VALVE	JOINTS
CW, HW, - UP TO 2-1/2 IN.	BALL	
CW, HW, - 3" AND UP	BUTTERFLY	
DOMESTIC WATER	BALL	

- F. BALL VALVES UP TO 2-1/2 INCHES: BRONZE TYPE BODY, STAINLESS STEEL FULL PORT BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE SOLDER ENDS.
- G. PROVIDE EXTENDED SHAFT HANDLES FOR BALL VALVES WHERE INSULATION IS REQUIRED TO ALLOW INSULATION OF SPECIFIED THICKNESS TO BE INSTALLED.
- H. BUTTERFLY VALVES: LUGGED DESIGN, DUCTILE IRON, ALUM. BRONZE DISK WITH RESILIENT EPDM SEAT, LEVER HANDLE FOR 4" AND SMALLER AND GEAR DRIVE FOR LARGER VALVES. BRAY OR APPROVED EQUAL.
- I. GATE VALVES SHALL BE OF THE SOLID TAPERED WEDGE TYPE, UNION BONNET, RISING STEM.
- J. FLOW LIMITING VALVES SHALL BE Y-BODY WITH REPLACEABLE INSERTS. MINIMUM OPERATING PRESSURE SHALL BE 2 PSI OR LESS. FLOW LIMITING VALVES SHALL BE GRISWOLD, HAYS OR APPROVED EQUAL.
- K. CHECK VALVES INSTALLED IN THE HORIZONTAL POSITION SHALL BE SWING CHECKS; VALVES INSTALLED IN THE VERTICAL POSITION SHALL BE SILENT CHECKS, EXCEPT THAT ALL CHECK VALVES IN PUMP DISCHARGES SHALL BE SILENT CHECKS.
- L. ALL VALVES 2 INCHES IN DIAMETER AND SMALLER SHALL BE ALL BRONZE WITH BRONZE BODIES. VALVES 2-1/2 INCHES IN DIAMETER AND LARGER SHALL HAVE IRON BODIES WITH BRONZE MOUNTINGS UNLESS OTHERWISE SPECIFIED.
- M. ALL VALVES AND SPECIALTIES SHALL BE SO PLACED AS TO PERMIT EASY OPERATION AND ACCESS.
- N. ALL VALVES UP TO 2 INCHES IN DIAMETER SHALL HAVE SWEAT OR SCREW ENDS, 2-1/2" IN DIAMETER AND OVER SHALL HAVE FLANGED ENDS.
- O. FLANGED BALL VALVES SHALL BE USED FOR REPLACEMENT OF GATE VALVES IN WATER SYSTEMS WHERE INDICATED ON DRAWINGS. FLANGED BALL VALVES SHALL BE AMERICAN VALVE SERIES 4000 OR APPROVED EQUAL.
- P. DRAIN VALVES SHALL BE PROVIDED WITH HOSE END, BRONZE BODY WITH CAP AND CHAIN.

3.4 CONTROL VALVES

- A. PROVIDE CONTROL VALVES. WATER VALVES SHALL BE SIZED FOR MAXIMUM OF 3 PSI PRESSURE DROP, HAVE EQUAL PERCENTAGE CHARACTERISTIC AND HAVE MINIMUM RANGEABILITY OF 100. VALVES MAY BE ROTARY OR GLOBE TYPE. ANSI LEAKAGE CLASS IV OR BETTER.
- B. ELECTRIC ACTUATORS SHALL HAVE MANUAL OVERRIDE PROVISIONS. PROVIDE SPRING RETURN FAIL-OPEN TYPE FOR PREHEAT APPLICATIONS. BELIMO MFT ACTUATORS OR APPROVED EQUAL.
- C. VALVES AND ACTUATORS SHALL BE BY BELIMO, OR APPROVED EQUAL.

3.5 PIPING ACCESSORIES

- A. STRAINERS SHALL BE Y-TYPE WITH REMOVABLE SCREEN. TWO-INCH AND SMALLER, SCREWED, MUSSCO #11, 2-1/2" AND LARGER, FLANGED CAST IRON MUSSCO #751 OR APPROVED EQUAL. PROVIDE BRASS SCREENS WITH 1/16" PERFORATIONS FOR WATER UP TO 3" INCLUSIVE AND ALL STEAM SIZES; 1/8" PERFORATIONS FOR 4" AND ABOVE FOR WATER.
- B. PROVIDE 4-1/2" PRESSURE GAUGES AS INDICATED ON DRAWINGS. PIPING FOR PRESSURE GAUGES SHALL BE STANDARD WEIGHT BRASS WITH SCREWED FITTINGS. PROVIDE PRESSURE SNUBBERS OR OIL FILLED GAGES. ACCURACY SHALL BE 1% OF SCALE RANGE. THE GAUGE RANGE SHALL BE SELECTED SO THAT THE OPERATING SYSTEM PRESSURE IS WITHIN THE MIDDLE THIRD OF THE GAUGE RANGE. PRESSURE GAGES TO BE PHOSPHOROUS BRONZE BOURDON TUBE TYPE, CAST ALUMINUM 4-1/2" DIAMETER CASE WITH BLOWOUT DISC, STAINLESS STEEL MOVEMENT WITH BRONZE BUSHING BRASS SOCKET AND BLACK NUMERALS ON A WHITE FACE. SHALL BE MODEL 500X AS MANUFACTURED BY H. O. TRESCOT OR APPROVED EQUAL. EACH GAUGE TO INCLUDE BRASS PETCOCK. GAUGES ON STEAM PIPING TO INCLUDE SIPHON.
- C. PROVIDE DIGITAL THERMOMETERS WITH LCD DISPLAY - WEISS OR AS APPROVED. THERMOMETERS AS INDICATED ON DRAWINGS. THERMOMETER TO HAVE ADJUSTABLE PIVOT AND BE PROVIDED WITH A SEPARABLE BRASS THERMOWELL. ACCURACY SHALL BE 1% OF FULL SCALE. RANGE SHALL BE SELECTED SO THAT THE NORMAL OPERATING SYSTEM TEMPERATURE IS WITHIN THE MIDDLE THIRD OF THE THERMOMETER RANGE. EACH THERMOMETER TO BE INSTALLED IN AN EXTENSION NECK BRASS SEPARABLE SOCKET. EXTENSION NECK LENGTH TO BE COORDINATED WITH INSULATION THICKNESS. SOCKET AND THERMOMETER INSERTION LENGTH TO BE MINIMUM OF 75% PIPE DIAMETER.

3.6 PIPING SYSTEMS INSTALLATION

- A. DIELECTRIC FITTINGS MUST BE USED AT JOINTS CONNECTING DISSIMILAR METAL PIPE OR VALVE MATERIALS.
- B. ROUTE PIPING IN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE, AND MAINTAIN SPECIFIED GRADIENTS.
- C. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
- D. INSTALL THERMOWELLS AND PRESSURE TAPS IN SYSTEM PIPING FOR THE CONTROL/S BUILDING MANAGEMENT SYSTEM SENSORS. COORDINATE LOCATION AND QUANTITY WITH THE CONTROLS SYSTEM SUBCONTRACTOR.
- E. ALL VALVES AND SPECIALTIES SHALL BE SO PLACED AS TO PERMIT EASY OPERATION AND ACCESS.
- F. PROVIDE VALVES IN ALL BRANCHES MAINS AND RISERS, AT ALL PUMPS, TANKS, REDUCING AND CONTROL VALVES, HEATING, AND COOLING SURFACES AND AT ALL APPARATUS; SO LOCATED, ARRANGED AND OPERATED AS TO GIVE COMPLETE SHUTOFF, EXCEPT WHERE FLANGED VALVES ARE USED. EACH CONNECTION TO EQUIPMENT SHALL INCORPORATE A UNION ON THE EQUIPMENT SIDE OF THE VALVE.
- G. PROVIDE LINE-SIZE BLOW-OFF VALVES AT ALL STRAINERS, AND WHERE SHOWN ON THE DRAWINGS.
- H. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS. PROVIDE FLANGED PIPING AT CHILLER HEADS TO ALLOW FOR PIPE REMOVAL FOR TUBE PULLS.
- I. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION, AND ACCESS TO VALVES AND FITTINGS.
- J. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN AT ALL LOW POINTS WITH 3/4" MINIMUM DRAIN VALVES AND CAPS.
- K. PROVIDE AUTOMATIC AIR VENTS AT SYSTEM HIGH POINTS AND AS INDICATED ON DRAWINGS. AIR VENTS TO BE 3/4" MINIMUM. PROVIDE SHUT OFF VALVES. PIPE VENTS TO DRAIN WHERE INSTALLED OVER ELECTRICAL EQUIPMENT OR IN A CONCEALED LOCATION.
- L. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
- M. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
- N. MINIMUM HORIZONTAL HEIGHT OF PIPING SHALL BE 8"-0", UNLESS APPROVED BY OWNER.
- O. BULLHEAD TEES ARE NOT PERMITTED.

- M. ALL NEW PIPING MUST BE TESTED. LEAK TEST SHALL BE CONDUCTED ON ALL PIPING SYSTEMS PRIOR TO FINAL CONNECTIONS TO EQUIPMENT OR APPLYING INSULATION OR CONCEALING. TEST SHALL BE CONDUCTED IN THE PRESENCE OF REPRESENTATIVE OF THE OWNER AND AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR IS TO CAP OFF OR ISOLATE ALL NEWLY INSTALLED PIPING AND HYDRAULICALLY PRESSURE TEST NEW PIPING AT 150 PERCENT OF THE SYSTEMS WORKING PRESSURE OR 100 PSI, WHICH EVER IS GREATER. TEST PRESSURE SHALL BE MAINTAINED FOR TWO (2) HOURS WITH NO DROP IN PRESSURE. THE CONTRACTOR SHALL PROVIDE TEMPORARY CONNECTIONS TO SERVICES, INSTRUMENTS, PUMPS AS NECESSARY FOR TESTING.
- N. PRE-OPERATIONAL CLEANING: AFTER THE PIPING SYSTEMS HAVE BEEN PRESSURE TESTED, THE CONTRACTOR SHALL PERFORM A PRE-OPERATIONAL CLEANING OF THE PIPING SYSTEMS. ALL CHEMICALS AND APPLICATION PROCEDURES SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. ENGINEER AND OWNER AND ENGINEER SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF WHEN THE CLEANING IS TO TAKE PLACE, AND SCHEDULE SHALL BE APPROVED BY THE OWNER AND ENGINEER.

3.7 WELDING

- A. JOINTS BETWEEN SECTIONS OF PIPE AND BETWEEN PIPE AND FITTINGS SHALL BE FUSION WELDED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY. MITERING OF PIPE TO FORM ELBOWS, MATCHING STRAIGHT RUNS TO FORM TEES OR ANY SIMILAR CONSTRUCTION SHALL NOT BE DONE.
- B. ALL WELDING SHALL BE DONE AS OUTLINED IN THE LATEST EDITION OF THE ASME CODE FOR PRESSURE PIPING.
- C. WELDING PROCESS - ALL WELDING SHALL BE DONE BY THE OXYACETYLENE OR ELECTRIC ARC WELDING PROCESS IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN WELDING OF PIPE JOINTS OF THE CODES FOR PRESSURE PIPING.
- D. BEVELING AND WELDING - ALL PIPE 2-1/2 INCHES AND LARGER MAY BE PURCHASED MILL BEVELED OR SHALL BE MACHINE BEVELED ON BOTH ENDS BEFORE WELDING. ON ODD LENGTHS OF PIPE, BEVELING MAY BE ACCOMPLISHED BY MEANS OF THE OXYACETYLENE CUTTING TORCH PROVIDED ALL PAINT, RUST, SCALE AND OXIDE ARE CAREFULLY REMOVED WITH HAMMER, CHISEL OR FILE AND BEVEL LEFT SMOOTH AND CLEAN. JOINTS SHALL BE PREPARED AND WELDED TO ASSURE THOROUGH FUSION OF ALIGNMENT AND THE PRODUCTION OF A JOINT THAT SHALL DEVELOP THE FULL STRENGTH OF THE PIPE AND THAT SHALL BE LEAKPROOF IN SERVICE.
- E. WELDING TEES - WELDING TEES SHALL BE USED WHEN SPECIFIED HEREINAFTER. WHERE NECESSARY, BRANCH CONNECTIONS SHALL BE REINFORCED IN AN APPROVED MANNER. FOR THE SMALLER BRANCHES, WHERE WELDING TEES ARE UNAVAILABLE, NOZZLES SHALL BE WELDED TO PIPE. WHERE SUCH NOZZLES ARE WELDED TO THE PIPE, ALL CUTTING OXIDE WHICH MAY DROP INSIDE THE PIPE SHALL BE REMOVED BEFORE WELDING THE BRANCH OR SECTION IN PLACE. WHERE BRANCH SIZE IS ONE HALF THE SIZE OF MAIN OR LARGER, USE WELDING TEES. WHERE BRANCH SIZE IS TWO (2) SIZES SMALLER THAN THE SIZE OF MAIN "WELDOLETS" OR "SOCKOLETS" MAY BE USED.
- F. WELDING RODS - THE WELDING ROD USED FOR WELDING STEEL AND WROUGHT IRON SHALL BE APPROVED WELDING ROD IN ACCORDANCE WITH ASTM SPEC. A233.
- G. WELDER SHALL BE FULLY CERTIFIED BY THE AUTHORITIES HAVING JURISDICTION TO CERTIFY WELDERS FOR PRESSURE PIPING.

3.8 PIPING INSULATION

- A. HOT WATER AND A/C CONDENSATE PIPES SHALL BE INSULATED. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. INSULATION SHALL BE MOLDED FIBERGLASS WITH FACTORY APPLIED VAPOR BARRIER JACKET. INSULATION SHALL HAVE SMOKE DEVELOPED RATING OF 25 OR LESS AND A FLAME SPREAD AND FUEL CONTRIBUTED RATING OF 50 OR LESS. FOR COLD WATER PIPING MAINTAIN INSULATION VAPOR BARRIER USING VAPOR BARRIER ADHESIVES AT JOINTS AND MASTIC AT END JOINTS AS RECOMMENDED BY MANUFACTURER.
- B. PROVIDE PREINSULATED PROTECTION SHIELDS AT PIPE HANGERS. INSERT MATERIAL FOR COLD PIPING TO BE FOAMGLAS OR OTHER APPROVED MATERIAL. INSERT MATERIAL FOR STEAM SHALL BE CALCIUM SILICATE OR OTHER APPROVED MATERIAL. PIPING SHALL NOT BE IN DIRECT CONTACT WITH HANGER FOR INSULATED PIPING. FOR COLD PIPING MAINTAIN VAPOR BARRIER AT PIPE SUPPORTS.
- C. INSULATION THICKNESS SHALL BE AS FOLLOWS:
- | SCHEDULE                               | SIZE             | THICKNESS |
|--|------------------|-----------|
| SERVICE                                |                  |           |
| HEATING HW & SW                        | 1-1/2" & SMALLER | 1-1/2"    |
| HEATING HW & SW                        | 2" AND LARGER    | 2"        |
| DOMESTIC WATER                         | ALL SIZES        | 1"        |
| A/C COND. DRAINS (CONCEALED LOCATIONS) | ALL SIZES        | 1/2"      |
- D. INSULATE VALVES AND OTHER COMPONENTS IN CHILLED WATER PIPING. INSULATION SHALL BE THE SAME THICKNESS AS ASSOCIATED PIPING. COMPONENTS REQUIRING ACCESS SHALL BE FITTED WITH REMOVABLE, INSULATED ENCLOSURE CONSTRUCTED OF RIGID INSULATION OR OTHER APPROVED METHOD.
- E. PROVIDE PREINSULATED PROTECTION SHIELDS AT PIPE HANGERS. INSERT MATERIAL FOR COLD PIPING TO BE FOAMGLAS OR OTHER APPROVED MATERIAL. PIPING SHALL NOT BE IN DIRECT CONTACT WITH HANGER FOR INSULATED PIPING. FOR COLD PIPING MAINTAIN VAPOR BARRIER AT PIPE SUPPORTS.

3.9 PIPING SYSTEMS HANGERS, ANCHORS AND SUPPORTS

- A. ATTACHMENTS TO STRUCTURE FOR ALL NEW AND MODIFIED PIPING TO BE SUPPORTED BY SUPPLEMENTARY STRUCTURAL STEEL CONNECTED TO STRUCTURAL BEAMS. PROVIDE ALL REQUIRED SUPPLEMENTARY STEEL.
- B. ATTACHMENTS FOR PIPING 2" AND SMALLER WITH LOADS ONLY UP TO 250 LBS. IS TO BE ACCOMPLISHED BY DRILLED-IN EXPANSION SHIELD TYPE ANCHORS.
- C. HANGERS FOR COPPER PIPING SHALL BE COPPER PLATED.
- D. BUILDING FIRE PROOFING SHALL BE RESTORED WHERE DISTURBED
- E. DO NOT HANG PIPING FROM HANGERS FOR OTHER TRADES.
- F. PIPE HANGERS SHALL BE OF THE CLEVIS TYPE, EXCEPT WHERE OTHERWISE NOTED.
- G. HANGER RODS SHALL BE GALVANIZED STEEL. HANGER ROD SHALL BE GALVANIZED AND NOT EXCEED 6 FEET IN LENGTH. SUPPLEMENTARY STEEL SHALL BE PROVIDED AS NECESSARY. PROVIDE HANGERS PER DRAWING DETAILS.
- H. BEAM CLAMPS - HANGERS SUPPORTED FROM STEEL SHALL BE APPROVED I BEAM CLAMPS FOR HANGERS SUPPORTING PIPING 2 INCHES AND SMALLER SHALL BE GRINNELL FIG. 2L7. FOR PIPING 2-1/2 INCHES AND LARGER, I BEAM CLAMPS SHALL BE FORGED STEEL. GRINNELL FIG. NO. 228. "C" CLAMPS ARE NOT TO BE USED.
- I. WHERE PIPING IS RUN NEAR THE FLOOR AND NOT HUNG FROM THE CEILING CONSTRUCTION, BUT IS SUPPORTED FROM THE FLOOR OR IN A TRENCH, SUCH SUPPORTS SHALL BE OF PIPE STANDARDS WITH BASE FLANGE AND ADJUSTABLE TOP YOKE.
- J. WHERE PIPING IS RUN ABOVE THE FLOOR, AND IS NOT HUNG FROM THE CEILING CONSTRUCTION OR NOT SUPPORTED FROM THE FLOOR, SUCH PIPING SHALL BE SUPPORTED FROM THE WALL WITH BRACKET HANGERS, EXPANSION BOLTED TO THE WALL.

3.10 PIPING SYSTEMS VIBRATION ISOLATION

- A. PROVIDE VIBRATION ISOLATION FOR ALL MOTORIZED EQUIPMENT. ALL SPRING TYPE ISOLATORS SHALL BE SEISMICALLY STABLE AND SHALL HAVE AN ADDITIONAL TRAVEL TO SOLID OF 50%. ALL COMPONENTS OF EXPOSED ISOLATORS INCLUDING FASTENERS SHALL BE CORROSION PROTECTED BY ZINC OR GALVANIZED PLATING, POWDER COATING OR OTHER METHODS ACCEPTABLE TO THE ENGINEER.

4.0 HOUSEKEEPING PADS

- A. PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED EQUIPMENT AND AS SHOWN ON DRAWINGS. MINIMUM HOUSEKEEPING PAD THICKNESS SHALL BE 4" AND EXTEND A MINIMUM OF 4" BEYOND THE EQUIPMENT ON ALL SIDES. PROVIDE 1" CHAMFER AT UPPER EDGES, ALL AROUND. HOUSEKEEPING PADS SHALL BE CONCRETE OF MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI. PROVIDE 6"x6" 10 GAUGE REINFORCING MESH.

5.0 IDENTIFICATION

- A. PROVIDE IDENTIFICATION OF PIPING USING SPRAY PAINT AND TEMPLATES OR WITH PLASTIC STRAP ON MARKERS AS MANUFACTURED BY SETON NAME PLATE COMPANY. COLORS AND LETTERING SHALL MATCH EXISTING. PIPING SHALL BE LABELED A MINIMUM OF EVERY 30 FEET AND WHERE PIPING PASSES THROUGH WALLS.
- B. PROVIDE IDENTIFICATION OF ALL NEW STARTERS AND OTHER EQUIPMENT USING APPROVED LABELS.
- C. ALL EQUIPMENT MUST HAVE THE MANUFACTURER'S NAMEPLATE VISIBLE AND SHALL NOT BE PAINTED OVER, INSULATED OR LOCATED WHERE DIFFICULT TO VIEW.

8.0 TESTING AND BALANCING

- A. SUBCONTRACT WITH AN INDEPENDENT AGENCY FOR THE TESTING, ADJUSTMENT,

AND BALANCING OF AIR AND WATER SYSTEMS. AGENCY SHALL BE COMPANY SPECIALIZING IN THE ADJUSTING AND BALANCING OF SYSTEMS SPECIFIED IN THIS SECTION WITH MINIMUM 5 YEARS EXPERIENCE, CERTIFIED BY AABC. PERFORM WORK UNDER SUPERVISION OF REGISTERED PROFESSIONAL ENGINEER. TOTAL SYSTEM BALANCE SHALL BE PERFORMED IN ACCORDANCE WITH AABC NATIONAL STANDARDS FOR FIELD MEASUREMENT AND INSTRUMENTATION, TOTAL SYSTEM BALANCE.

- B. PRIOR TO START THE TESTING AND BALANCING THE CONTRACTOR SHALL CONFIRM THE SYSTEM ARE PROPERLY CLEAN, CONSTRUCTION DEBRIS REMOVED FROM THE RETURN PLENUMS AND ALL FILTERS REPLACED.

- C. ADJUST FLOW TO WITHIN 10 PERCENT OF DESIGN REQUIREMENTS. PREPARE AND SUBMIT A BALANCING REPORT SHOWING ALL READINGS OF CFM FOR EACH OUTLET, TRAVERSES OF ALL MAIN SUPPLY AIR DUCTS AND THE TOTAL FOR THE SYSTEM. REPORT TO INCLUDE DESIGN VALUES FOR THE SAME. REPORT TO INCLUDE ACTUAL ELECTRICAL CHARACTERISTICS OF EACH PIECE OF EQUIPMENT TO BE BALANCED (RPM, AMPS, BHP, ETC.) AS WELL AS ELECTRICAL NAMEPLATE CHARACTERISTICS. ACCURATELY RECORD ACTUAL LOCATIONS OF BALANCING VALVES AND DAMPERS.

- D. SEQUENCE WORK TO COMMENCE AFTER COMPLETION OF SYSTEMS AND SCHEDULE COMPLETION OF WORK BEFORE SUBSTANTIAL COMPLETION OF PROJECT. BEFORE COMMENCING WORK, VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE. ENSURE THE EQUIPMENT IS OPERABLE AND IN A SAFE AND NORMAL CONDITION, THE TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE AND PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT. BEGINNING OF WORK MEANS ACCEPTANCE OF EXISTING CONDITIONS.

- E. REPORT ANY DEFECTS OR DEFICIENCIES NOTED DURING PERFORMANCE OF SERVICES TO ENGINEER. PROMPTLY REPORT ABNORMAL CONDITIONS IN MECHANICAL SYSTEMS OR CONDITIONS WHICH PREVENT SYSTEM BALANCE.

- F. PERMANENTLY MARK SETTINGS OF DAMPERS AND OTHER ADJUSTMENT DEVICES ALLOWING SETTINGS TO BE RESTORED. SET AND LOCK MEMORY STOPS. AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.

- G. LEAVE SYSTEMS IN PROPER WORKING ORDER, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS.

- H. REPLACE BELTS AND SHEAVES FOR EXISTING FANS WHERE A SPEED CHANGE IS REQUIRED TO ACHIEVE CFM INDICATED ON DRAWINGS AND TO MINIMIZE FAN ENERGY.

COORDINATION DRAWING

1.1 DESCRIPTION

- A. GENERAL CONTRACTOR SHALL COORDINATE CONSTRUCTION OPERATIONS, INCLUDED IN VARIOUS SECTIONS OF SPECIFICATIONS AS PROVIDED TO ASSURE EFFICIENT AND ORDERLY INSTALLATION OF ALL PARTS OF WORK. COORDINATE CONSTRUCTION OPERATIONS INCLUDED UNDER DIFFERENT SECTIONS THAT DEPEND ON EACH OTHER FOR PROPER INSTALLATION, CONNECTION, AND OPERATION. COORDINATION OF ALL PARTS OF WORK SHALL BE LIMITED TO BUT NOT EXCLUSIVE OF THE CONTRACT TO WHICH GENERAL CONTRACTOR IS UNDER CONTRACT TO PROVIDE.
- B. COORDINATION DRAWINGS: REPRODUCIBLE DRAWINGS SHOWING WORK WITH HORIZONTAL AND VERTICAL DIMENSIONS TO AVOID INTERFERENCE WITH STRUCTURAL FRAMING, CEILINGS, PARTITIONS, EQUIPMENT, LIGHTS, MECHANICAL, ELECTRICAL, CONVEYING SYSTEMS, AND OTHER SERVICES:
- IN AND ABOVE CEILINGS.
  - WITHIN WALLS.
  - WITHIN CHASES.
  - IN MECHANICAL SPACES.
  - IN ELECTRICAL SPACES.
- C. PREPARE COORDINATION DRAWINGS WHERE COORDINATION IS NEEDED FOR INSTALLATION OF PRODUCTS AND MATERIALS FABRICATED BY SEPARATE ENTITIES.
- D. PREPARE COORDINATION DRAWINGS WHERE LIMITED SPACE AVAILABILITY NECESSITATES MAXIMUM UTILIZATION OF SPACE FOR EFFICIENT INSTALLATION OF DIFFERENT COMPONENTS.
- E. COORDINATE INSTALLATION OF DIFFERENT COMPONENTS TO ASSURE MAXIMUM ACCESSIBILITY FOR REQUIRED MAINTENANCE, SERVICE, AND REPAIR.
- F. WORK OUT ALL "TIGHT" CONDITIONS INVOLVING WORK OF VARIOUS SECTIONS IN ADVANCE OF INSTALLATION.
- G. SLEEVE, COREDRILL AND BLOCKOUT LAYOUT DRAWINGS: DRAWINGS SHOWING PROPOSED LOCATIONS AND SIZES OF SLEEVES, COREDRILLS BLOCKOUTS, AND EMBEDDED ITEMS IN CONCRETE WALLS, COLUMNS, FLOORS AND BEAMS.
- H. PRIOR TO START OF WORK AND INSTALLATION IN ANY GIVEN AREA, CONTRACTOR/SUBCONTRACTOR TO WHICH GENERAL CONTRACTOR IS UNDER CONTRACT SHALL APPROVE, SIGN, COORDINATION DRAWINGS AFFECTING THE CONTRACTOR/SUBCONTRACTOR'S WORK IN THAT AREA.
- I. MODIFICATIONS REQUIRED AS RESULT OF FAILURE TO RESOLVE INTERFERENCE'S, PROVIDE CORRECT COORDINATION DRAWINGS, OR CALL ATTENTION TO CHANGES REQUIRED IN OTHER WORK AS RESULT OF MODIFICATIONS SHALL BE PAID FOR BY RESPONSIBLE CONTRACTOR/SUBCONTRACTOR.
- J. COORDINATION MEETINGS SHALL BE SCHEDULED BY THE GENERAL CONTRACTOR, WITH ALL AFFECTED SUBCONTRACTORS.

1.2 PRODUCTION OF COORDINATION DRAWINGS

- A. CONTRACTOR SHALL PROVIDE MINIMUM 1/4 IN SCALE PLAN, ELEVATION AND SECTION DRAWINGS, BOTH AS PAPER HARD COPIES AND AS CAD ELECTRONIC FILES PREFERABLY DEVELOPED USING AUTOCAD, SHOWING:
- PARTITIONS.
  - FIRE/SMOKE RATED BARRIERS.
  - CEILING HEIGHTS.
  - STRUCTURAL FRAMING LOCATIONS AND ELEVATIONS.
  - COLUMN LINES.
  - OTHER WORK.

- B. GENERAL CONTRACTOR SHALL PROVIDE AS IS CONTRACTED PER INDIVIDUAL TRADE, COORDINATION DRAWINGS IN ORDER FOR CONTRACTOR/SUBCONTRACTORS TO PRODUCE COMBINED COORDINATION LAYOUT DRAWINGS PLAN AND SECTIONS OF HVAC DUCTWORK, HYDRONIC, STEAM, CONDENSATE, FUEL OIL, FIRE PROTECTION PIPING, PLUMBING, SPECIAL WATER SYSTEMS, GAS SYSTEMS, ELECTRICAL CABLE TRAY, CONDUIT, CONVEYING SYSTEMS, EQUIPMENT AND OTHER WORK, WHERE APPLICABLE.

- C. GENERAL CONTRACTOR SHALL WORK TO RESOLVE MAJOR INTERFERENCE'S AT INITIAL COORDINATION MEETING PRIOR TO PRODUCTION OF ANY DRAWINGS.
- D. GENERAL CONTRACTOR SHALL WORK TO PRODUCE INITIAL COORDINATION DRAWINGS WITHIN REASON, AFTER INITIAL MEETING, SO AS NOT TO DELAY PROPOSED TIMELINES, AND SCHEDULES.

- E. GENERAL CONTRACTOR SHALL MEET AS IS REQUIRED, WITHIN REASON, TO RESOLVE INTERFERENCE'S AND CORRECT DRAWINGS.

1.3 AFTER APPROVAL

- A. AFTER SUBCONTRACTORS' WRITTEN APPROVAL OF COORDINATION DRAWINGS, CONTRACTOR SHALL DETERMINE METHOD USED TO RESOLVE INTERFERENCE'S NOT PREVIOUSLY IDENTIFIED.
- B. CONTRACTOR SHALL GIVE WRITTEN APPROVAL OF CHANGES TO COORDINATION DRAWINGS PRIOR TO START OF WORK IN AFFECTED AREA.
- C. MAINTAIN ONE COPY OF CURRENT APPROVED COORDINATION DRAWINGS AT PROJECT SITE.

1.4 PRECEDENCE OF SERVICES FOR COORDINATION DRAWINGS

- A. IN EVENT OF CONFLICTS INVOLVING LOCATION AND LAYOUT OF WORK, GENERAL CONTRACTOR SHALL USE THE FOLLOWING PRIORITY TO RESOLVE DISPUTES:
- STRUCTURE AND PARTITIONS HAVE HIGHEST PRIORITY.
  - EQUIPMENT LOCATION AND ACCESS.
  - CEILING SYSTEM AND RECESSED LIGHT FIXTURES.
  - GRAVITY DRAINAGE LINES.
  - HIGH PRESSURE DUCTWORK AND DEVICES.
  - LARGE PIPE MAINS, VALVES AND DEVICES.
  - LOW PRESSURE DUCTWORK, DIFFUSERS, REGISTERS, GRILLES, HVAC EQUIPMENT.
  - FIRE PROTECTION PIPING, DEVICES AND HEADS.
  - SMALL PIPING, TUBING, ELECTRICAL CONDUIT, AND DEVICES.

- B. CONDUITS INSTALLED IN CORRIDORS SHALL BE MAINTAINED AT LEAST 9 IN ABOVE FINISHED CEILING. CONDUITS SHALL BE GROUPED WITHIN A 12 IN WIDTH.
- C. THE SPACE UTILIZED FOR CONDUIT SHALL BE SELECTED TO ALLOW ACCESS TO ALL DEVICES WHICH NORMALLY REQUIRE ADJUSTMENT, REPAIR, RESETTING, ETC.
- D. SLEEVES THROUGH RATED PARTITIONS.
- E. ACCESS PANELS.

1.5 PRODUCTION OF LAYOUT DRAWINGS

- A. CONTRACTOR SHALL PROVIDE TO GENERAL CONTRACTOR SCALE PLAN AND ELEVATION DRAWINGS, IN CAD FORMAT PREFERABLY FOR USE WITH AUTOCAD
- B. SUBCONTRACTORS SHALL INDICATE TO GENERAL CONTRACTOR, PROPOSED LOCATION AND SIZE OF THEIR REQUIRED SLEEVES, COREDRILLS, BLOCKOUTS AND EMBEDDED ITEMS:
- AT FLOOR SLABS AND WALLS TO BE CORE DRILLED OR CUT, CONTRACTOR SHALL FIND AND MARK ALL REINFORCING IN BOTH FACES LOCATED BY MEANS OF X-RAY, PACH-OMETER, OR PROF-OMETER. SUBMIT SKETCH SHOWING LOCATION OF REBAR AND PROPOSED CORES FOR REVIEW AND IMPLEMENTATION BY GENERAL CONTRACTOR.

1.6 SUBMITTALS

- A. PROJECT INFORMATION:
- CONTRACTOR'S APPROVED COORDINATION DRAWINGS.
  - LETTER INDICATING ONE COPY OF APPROVED COORDINATION DRAWINGS AVAILABLE AT PROJECT SITE.
  - ONE COPY OF APPROVED COORDINATION DRAWINGS TO THE OWNER/GENERAL CONTRACTOR FOR INFORMATION, IF REQUESTED.
  - CONTRACTOR'S PROPOSED SLEEVE, COREDRILL AND BLOCKOUT LAYOUT DRAWINGS.

12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
<div><div><div><div><div><div><b>Southport</b></div></div></div><div><div><div><span></span></div></div><div><div>Engineering Associates, PC</div></div></div><div><div><div><div><div><div><span></span></div><div><span></span></div></div></div><div><div><div><span></span></div><div><span></span></div></div></div><div><div><div><span></span></div><div><span></span></div></div></div><div><div><div><span></span></div></div></div></div><div><div><div>11 BAILEY AVENUE RIDGEFIELD, CT 06877</div><div>TEL: 203-431-6844 FAX: 203-431-6877</div></div></div></div></div></div></div></div>			
PROJECT:	TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877		
DRAWING TITLE:	MECHANICAL SPECIFICATIONS (CONTINUED)		
SCALE:	AS NOTED	DRAWN BY:	JCP
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	BU
DRAWING NO:		M-101	





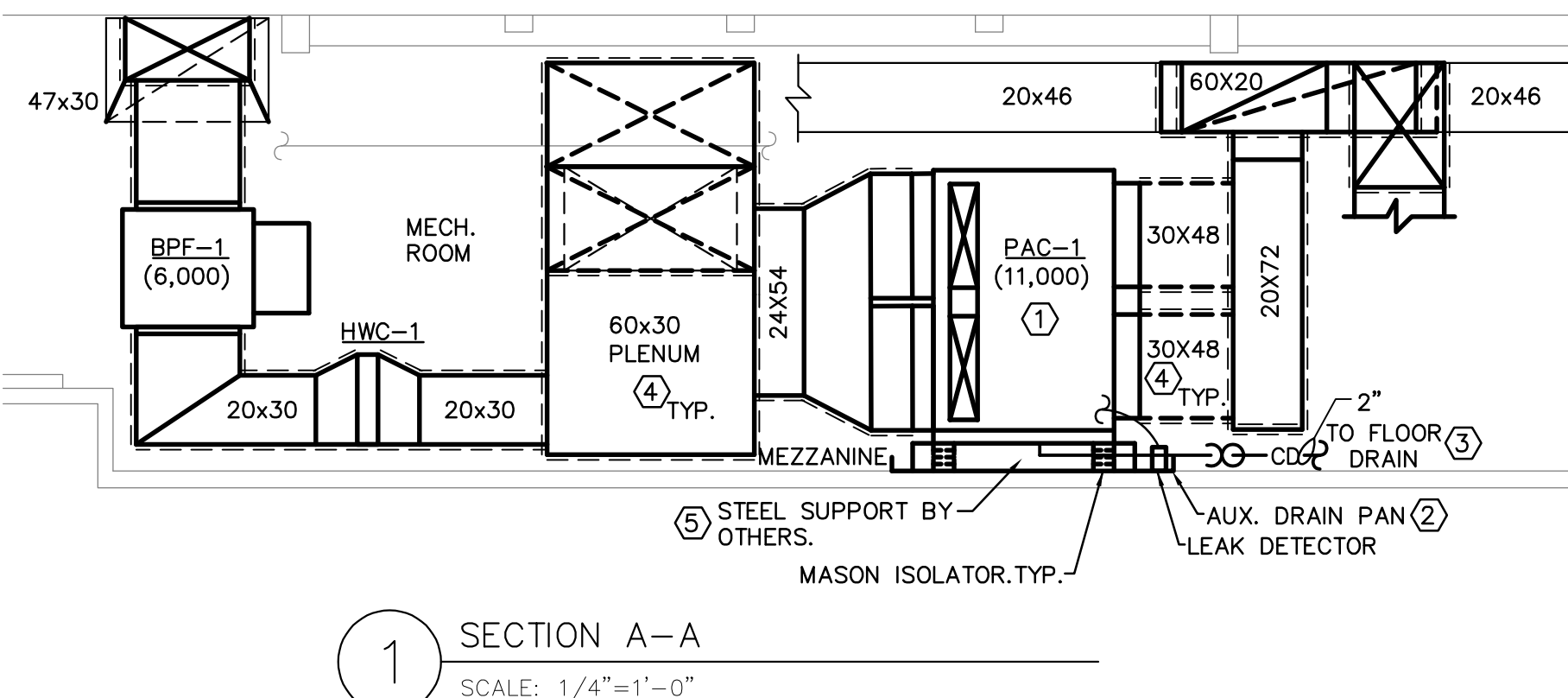
1. DEMOLISH ALL EXISTING DAMAGED, UNIFORM PRESSURE AND LOW PRESSURE DUCT WORK IN AREA OF WORKING DAMAGED ALL TYPICAL DUCTWORK, DIFFUSERS, DISCONNECT AT EXISTING HANGERS OR ON FIVE-FOOT DAMPERS, CAP & SEAL ALL EXISTING DAMAGED DUCTWORK.
2. DISCONNECT AND REMOVE ALL EXISTING SUPPLY AIR DUCTS AND FANS ON THE FLOOR. DISCONNECT SHALL INCLUDE ALL OTHER CONNECTIONS, CONTROLS, DIFFUSERS AND FANWORK ASSOCIATED WITH THE SUPPLEMENTAL UNIT.
3. DEMOLITION SHALL CONFORM TO BUILDING RULES & REGULATIONS. IN SUBMITTING HIS BID, CONTRACTOR IS ASSURED HE HAS REVIEWED & ACCEPTED ALL CITY, STATE & FEDERAL REQUIREMENTS.
4. REMOVE ALL EXISTING SUPPLEMENTAL STEEL FOR UNITS AND FANS THAT ARE BEING REMOVED.
5. UPON COMPLETION OF WORKING DEMOLITION, VERIFY OPERATION OF EXISTING FLOOR ISOLATION DAMPERS.
6. THE CONTRACTOR SHALL PERFORM DEMOLITION & REMOVAL WORK WITH MINIMAL INTERFERENCE WITH FUNCTIONING OF THE BUILDING.
7. DEMOLITION SHALL BE COMPLETED BY A HEAT AND WORKMANSHIP MANAGER, THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
8. THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEDUCTIONS AND PASSING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN ADVANCE OF THE DEMOLITION WORK.


- ① REMOVE EXISTING OUTRIGER AIR INTAKE (LOWER) AND ASSOCIATED DUCTWORK BACK TO EXISTING UNIT LOCATION FOR EASE OF DEMOLITION/REMOVAL OF UNIT. LOWER AND DUCTWORK ARE TO REMAIN REMOVED UNTIL NEW UNITS ARE BROUGHT INTO MECHANICAL ROOM.  
  
REMOVE EXISTING EXHAUST FAN AND CUT BACK POWER. REMOVE EXISTING HOUSING/DRIP PAN.
- ② REMOVE EXISTING ALL-1 VENTILATION UNIT. DISCONNECT FROM DUCTWORK AND CUT BACK TO APPROPRIATE POINTS AS SHOWN ON PLAN AND CAP TEMPORARILY. CUT BACK TO EXISTING UNIT LOCATION FOR EASE OF DEMOLITION/REMOVAL OF UNIT. HOUSING/DRIP PAN. HOT WATER PIPING TO BE CUT BACK TO ALLOW FOR REMOVAL OF UNIT AND PREPARED FOR RECONNECTION TO NEW UNITS IN CONSTRUCTION PHASE.
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12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
 <p><b>Southport</b> Engineering Associates, PC</p> <p>11 BAILEY AVENUE RIDGEFIELD, CT 06877</p> <p>TEL: 203-431-6844 FAX: 203-431-6877</p>			
PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE: MECHANICAL CONSTRUCTION PLAN			
SCALE:	AS NOTED	DRAWN BY:	JCP DRAWING NO:
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	BU
M-300			



DESIGNATION	LOCATION	SERVICE	VAV OR CAV	MIN. OA CFM	ELECTRIC				FAN		FILTERS		COOLING COIL				COMPRESSOR				HOT WATER COIL				POOL HEATING				REMOTE CONDENSER				OPERATING WEIGHT (LBS.)	VIBRATION ISOLATION		MANUFACTURER INFORMATION		REMOTE CONDENSER MODEL NO.														
					MCA	MOPC	FLA	V-PHASE-HZ	CFM	ESP	MHP	TYPE	DX OR CHW	SENSIBLE MBH	TOTAL MBH	EAT DB/F	WB/F	LAT DB/F	WB	REFRIGERANT TYPE	REMOVAL (LBS./HR)	#	4	LAT	EBT	LWT	GWP	MO	WD	EAT	EBT	LWT		GWP	MO	WD	EAT		EBT	LWT	GWP	MO	WD	INDOOR	REMOTE COOLER	MOUNTING TYPE	BASE TYPE	NAME	EVAPORATOR SECTION MODEL NO.			
PAC-1	SEE PLAN	NATORATORIUM	CAV	3900	113	150	102.6	208V/3PH/60	10800	1.5	5	(2)	-	DX	157.9	287.1	86	71	-	R410A	119.6	2	40.4	217.0	470	82	144	180	160	51	7	0	186	36	10	95	358.9	0.75	3.6	2	4.2	8.5	2	23	30	3000	1300	SPRING	RAIL	SERESCO	NE-220-PG-I-J-3GNH0103W2C3AN3H	NG-V-12

1. THE CONTRACTOR MUST PROVIDE UNIT WITH THE FOLLOWING: DISCONNECT SWITCH, SPRING-TYPE VIBRATION ISOLATORS, WMS FOR INTAKE AND DISCHARGE, LOW AMBIENT DAMPER, START-UP AND TRAINING BY UNIT MANUFACTURER'S REP.	5. PROVIDE SPRING TYPE VIBRATION ISOLATORS FOR ALL REFRIGERANT & WATER PIPING FOR A MINIMUM OF 20 FT. FROM AC & CONDENSING UNIT.	10. PROVIDE MANUFACTURER RECOMMENDED FLUID COOLER PUMP PACKAGED INCLUDING ALL ASSOCIATED PIPING SPECIALTIES, CIRCUITRY AND CONTROLS.
2. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.	6. COORDINATE ROUTING FOR NEW POOL HEATING PIPING FROM POOL FILTRATION ROOM.	11. PROVIDE MANUFACTURER RECOMMENDED CONTROLLER WITH BACNET FOR INTERFACE WITH NETWORK DEVICES.
3. PROVIDE MOUNTING STEEL SUPPORTS, WELDED STAINLESS STEEL DRIP PAN, CONDENSATE PUMP AND LEAK DETECTOR WITH LEAK DETECTOR PANEL WITH SOUND AND VISUAL ALARM.	7. COORDINATE WITH NEW EXHAUST FANS FOR INTERLOCK AND CONTROL.	12. PROVIDE UNIT WITH OPTIONAL MINIMUM OUTDOOR AIR (OA) OPENING EQUIPPED WITH A MOTORIZED DAMPER AND FILTER.
4. PROVIDE A CONTROL PANEL WITH CONTROLLER AND ALL REQUIRED SPECIALTY EQUIPMENT OF OPERATION AS INDICATED ON CONTROL DRAWING M-500. PROVIDE INTERLOCKS TO OUTDOOR AIR AND SPILL DAMPERS AS REQUIRED.	8. MAINTAIN MANUFACTURER REQUIRED CLEARANCES AROUND ALL EQUIPMENT.	13. PROVIDE UNIT WITH OPTIONAL MAXIMUM OUTDOOR AIR (OA) DAMPER TO SET PROPER AMOUNT OF OUTDOOR AIR INTAKE.
	9. PROVIDE WITH MANUFACTURER PROVIDED CONTROLLER. CONTROLLER SHALL BE STANDALONE, WITH CAPABILITY FOR REMOTE NETWORK ACCESS.	14. PROVIDE OUTDOOR FLUID COOLER WITH EC-TYPE/MODULATING FANS

HOT WATER COIL SCHEDULE														REMARKS
TAG	MANUFACTURER / MODEL	SERVES	LOCATION	MODEL	SIZE	CFM	HEATING CAPACITY					FMS PER INCH	COIL ROWS	
							TOTAL MBH	FLOW (GPM)	WATER PRESSURE DROP (FT H2O)	EWI/L/WT (°F)	EAT / LAT (db)			
HWC-1	HACK ENVIRONMENTAL	BPF-1	SEE DWGS	5WCO801A	30x20	6000	65	6	0.6	180 / 153	82 / 93	8	1	1,2,3
NOTES:	1. PROVIDE 24 VAC VALVE PACKAGE INCLUDING MOTORIZED VALVES, HAYS MERSUFLO #2517 AUTOFLOW REGULATORS, SHUTOFF VALVES, STRAINER W /BLOWDOWN AND PT PORTS REMOTE INSTALLED. CONTRACTOR SHALL FULLY INSULATE PIPING ASSEMBLY PRIOR TO INSTALL.													
	2. TUBING (IN): 0.625x0.025 COPPER, FIN MATERIAL (IN): 0.0095 ALUMINUM, GALVANIZED STEEL-FLANGED CASING													
	3. PROVIDE WITH TWO WAY MOTORIZED CONTROL VALVE													

HOT WATER PUMP CIRCULATOR SCHEDULE										
MARK NO.	LOCATION	SERVICE	TYPE	GPM	HEAD FT	MOTOR			MANUFACTURER / MODEL	NOTES
PP-1	POOL PUMP RM	HOT WATER	IN-LINE	36	56	208	PH	HP	RPM	
						3	2	1800	B&G - e-805C / 1.5X1.5X9.5B	1,2,3,4,5

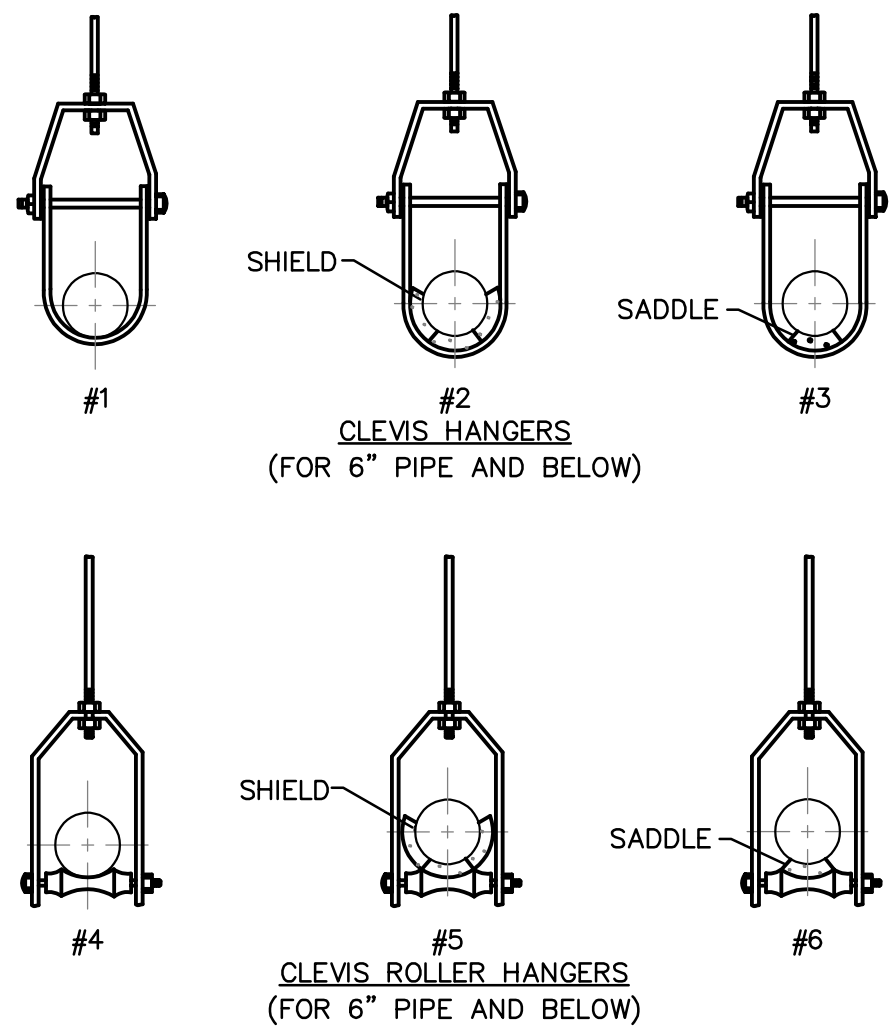
Notes:

1. Provide integral disconnect
2. Provide starters and control wiring as required
3. Stainless Steel Pump Body
4. Seal shaft have EPR elastomers, stainless steel spring and silicon carbide (SiC-SiC)
5. Provide 304 stainless steel impeller

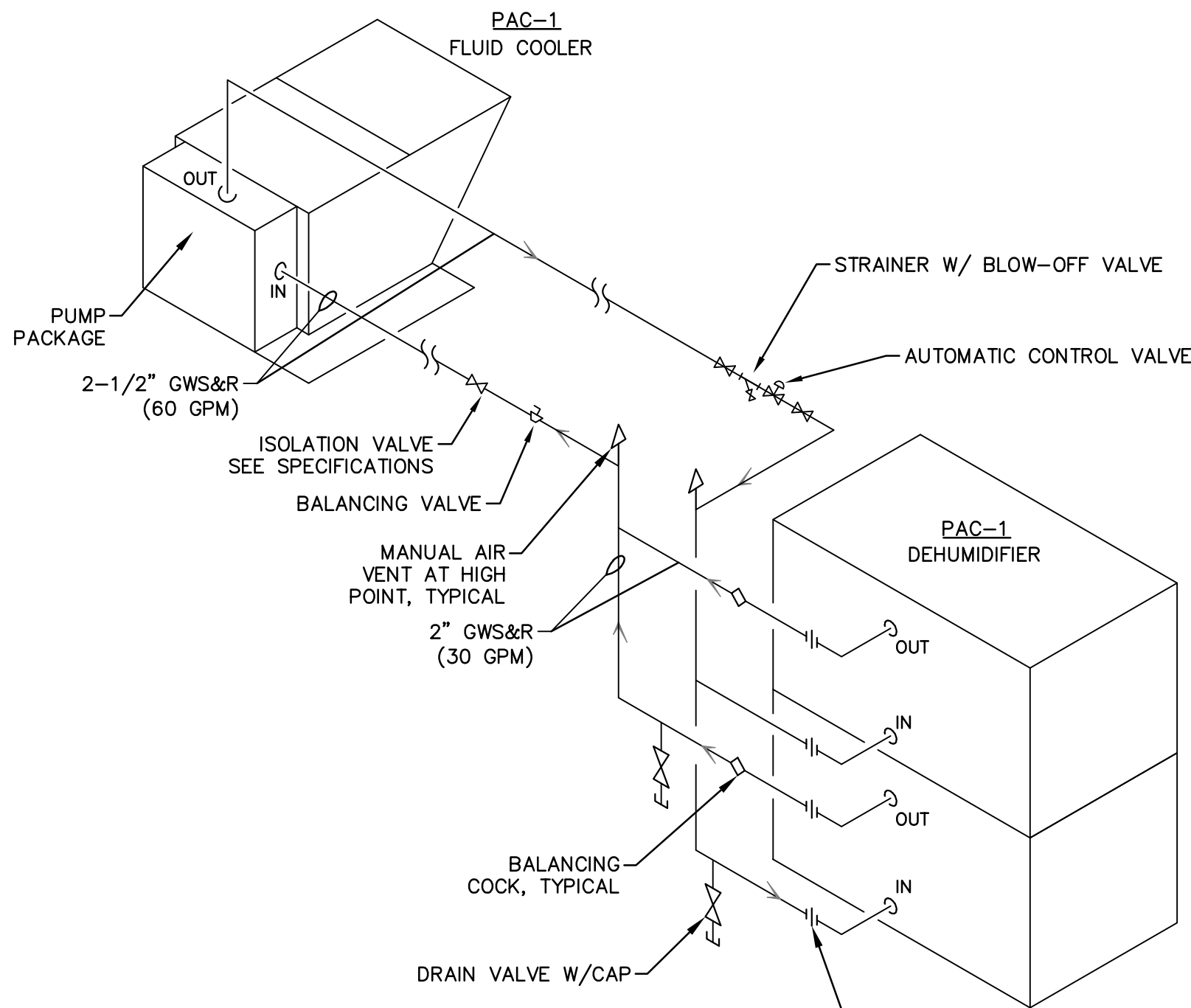
1. PIPE SUPPORTS, ROD SPACING AND ROD SIZING SHALL COMPLY TO MSS-69.
2. SHIELDS AND HIGH DENSITY INSULATION SHALL BE A MINIMUM OF 12" OR 1.5 PIPE DIAMETER WHICHEVER IS LONGER, MAXIMUM LENGTH OF SHIELD IS 24". SHIELDS THICKNESS 0.06 UP TO 6 INCH PIPE SIZE. 0.075" FOR LARGER SIZES.

HANGER ROD SCHEDULE		HANGER ROD SPACING	
PIPE SIZE	ROD SIZE	PIPE SIZE	MAX. SPACING
UP TO 2"	3/8" DIA.	1/2" to 1-1/4"	9'
2 1/2" THRU 3"	1/2"	1 1/2"	7'
4 & 5"	5/8"	2" AND 3"	10'
6"	3/4"	4" AND 5"	14'
8 THRU 12"	7/8"	6" AND 8"	17'
LARGER SIZES	1"	LARGER	20'

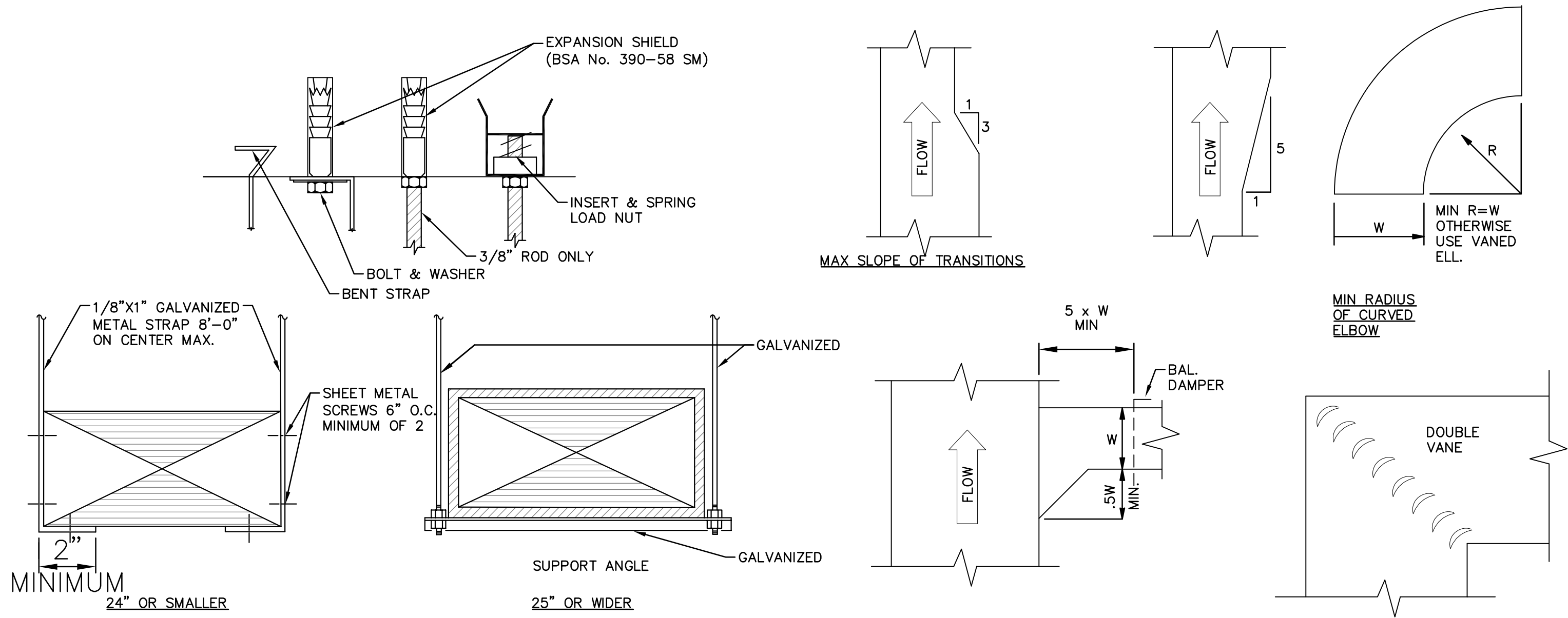
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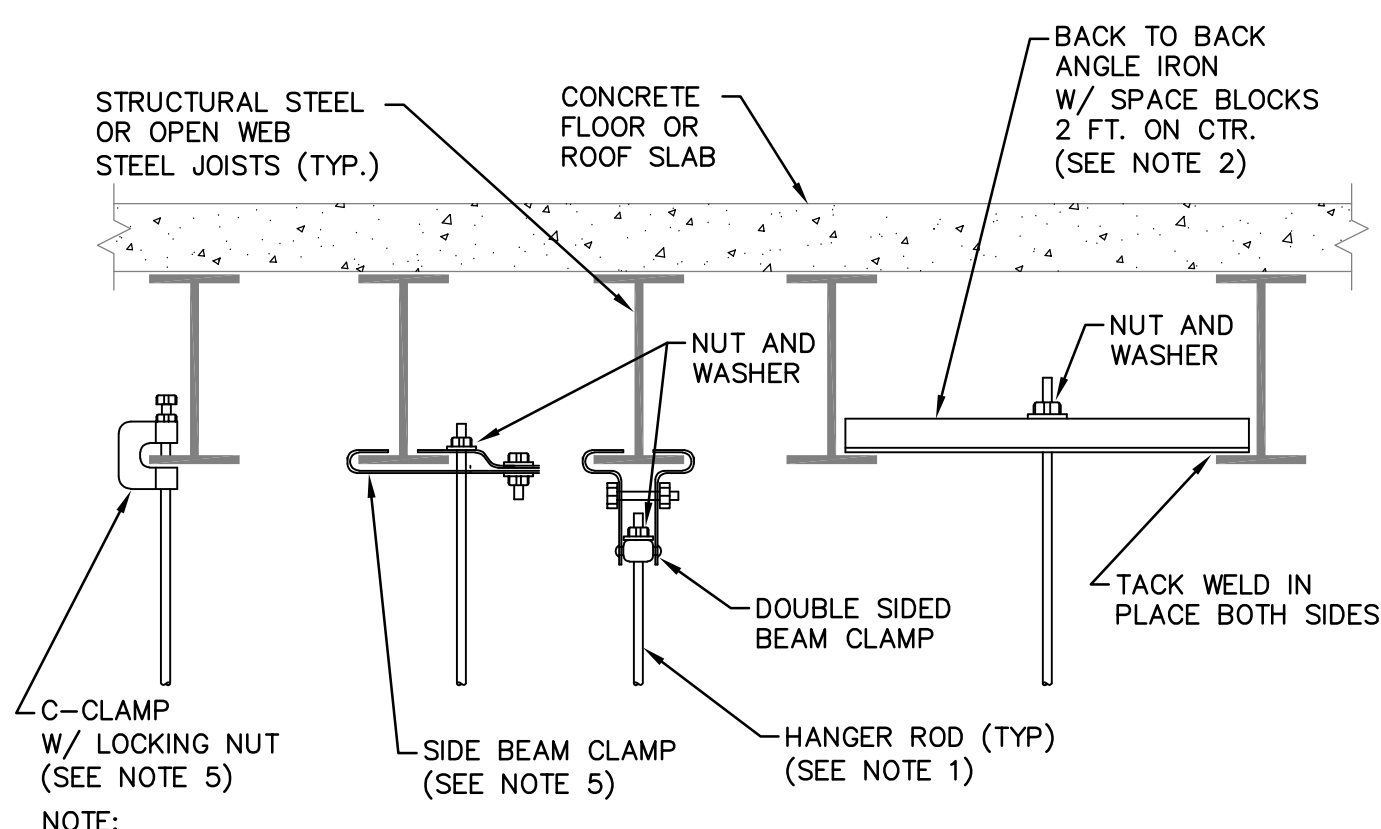
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DUCT WIDTH.	ROD DIA.	SUPPORT ANGLE OR EQUIV. CHANNEL	MAXIMUM SPACING	MAXIMUM AREA
25" TO 30"	3/8"	1 1/2" X 1 1/2" X 1/8"	8'-0" O.C.	4 SQ. FT.
31" TO 42"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
43" TO 60"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
61" TO 84"	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.
85" & UP	3/8"	1 1/2" X 1 1/2" X 1/8"	6'-0" O.C.	10 SQ. FT.

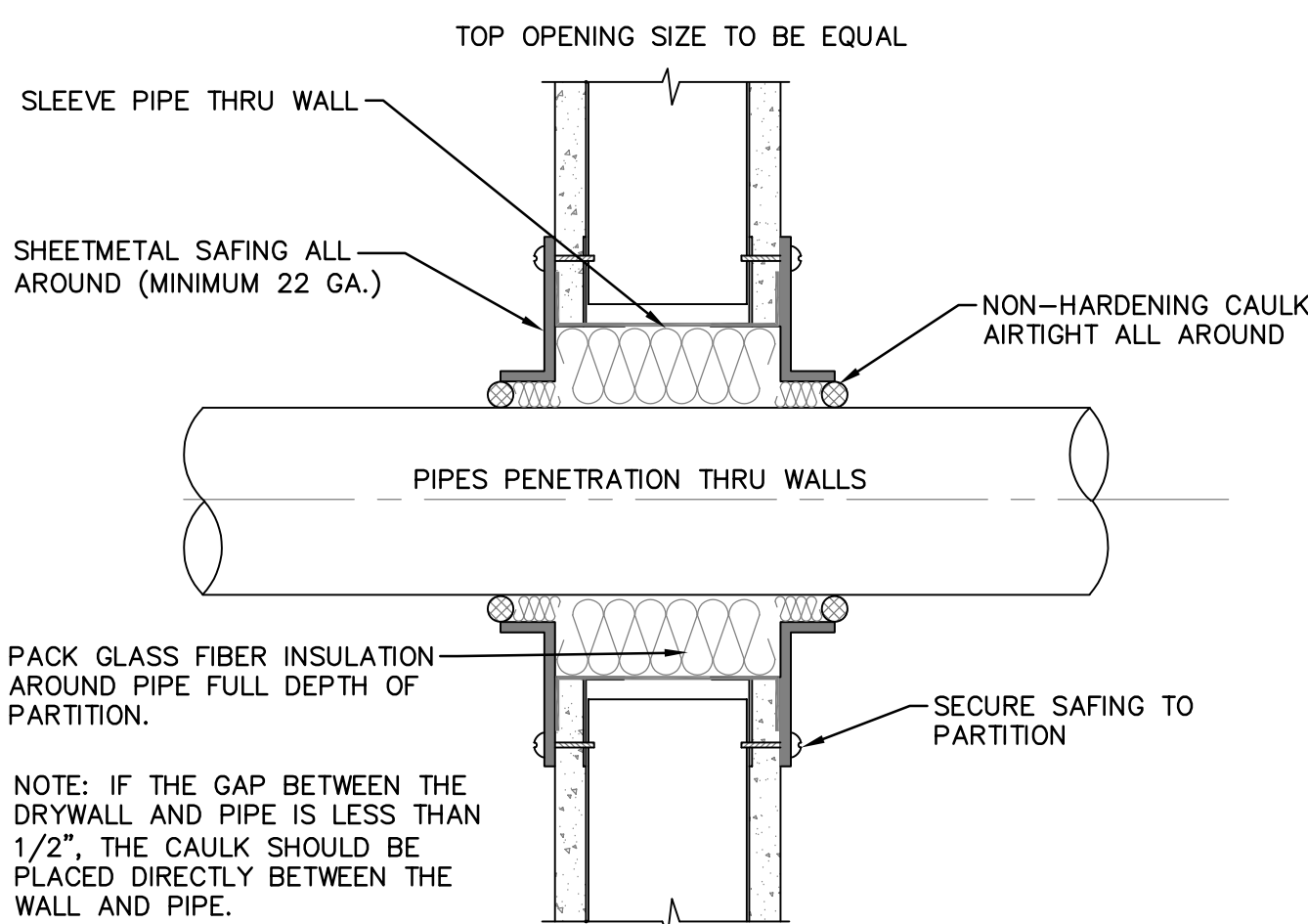
\* REDUCE SPACING TO NEXT SMALLER INTERVAL IF DUCT AREA EXCEEDS MAXIMUM

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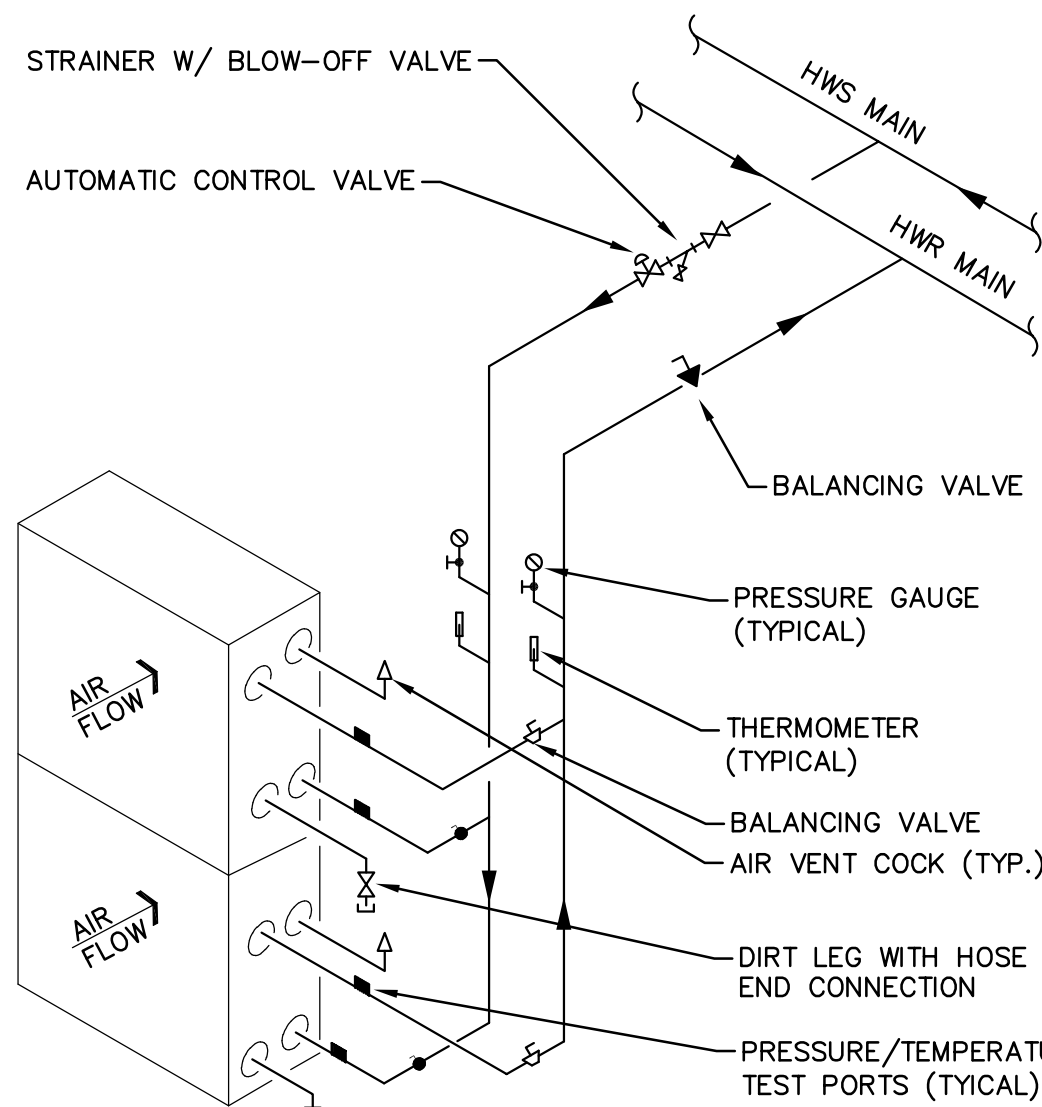


1. REFER TO PIPE HANGER HANGER ROD FOR HANGER ROD SIZE, FOR CEILING SUSPENDED EQUIPMENT PROVIDE MIN. 3/8" DIA. HANGER ROD [REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS].
2. FOR PIPES UNDER 1" USE 1 SINGLE 1-1/2" x 1-1/2" x 1/4" ANGLE IRON WITH C-CLAMP. FOR PIPES 2-1/2" AND LARGER USE 3" x 3" x 1/4" ANGLE IRON BACK TO BACK AS SHOWN.
3. REFER TO "TYPICAL METHOD OF SECURING HANGER RODS TO CONCRETE DECK DETAIL" FOR ATTACHING HANGER RODS TO CONCRETE DECK.
4. REPAIR OF FIREPROOFING IN ORDER TO FACILITATE THE INSTALLATION OF HANGER RODS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. USE OF C-CLAMPS AND SIDE BEAM CLAMPS IS LIMITED TO PIPING 2-1/2" AND UNDER.

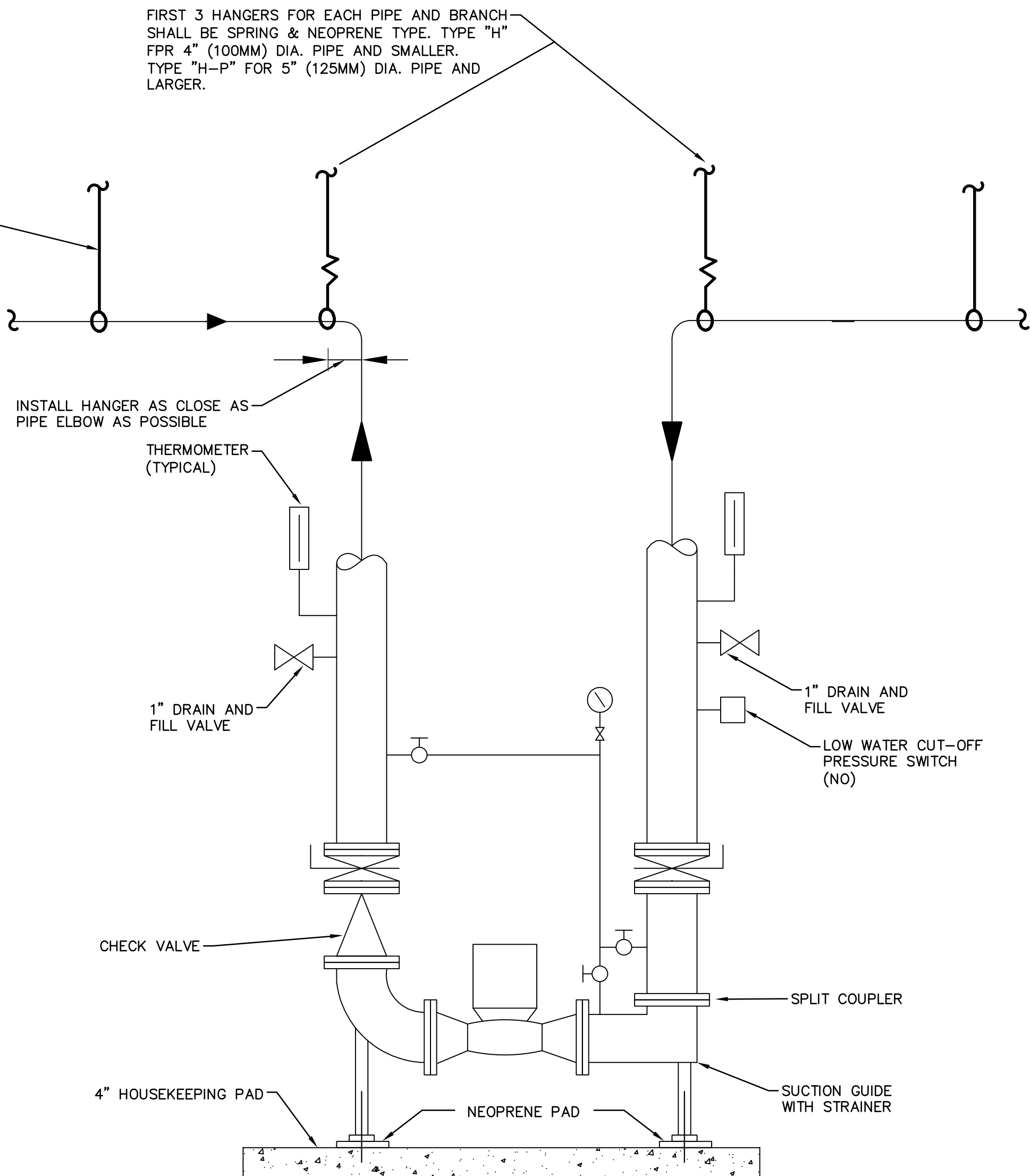
② RODS T  
SCALE: NONE



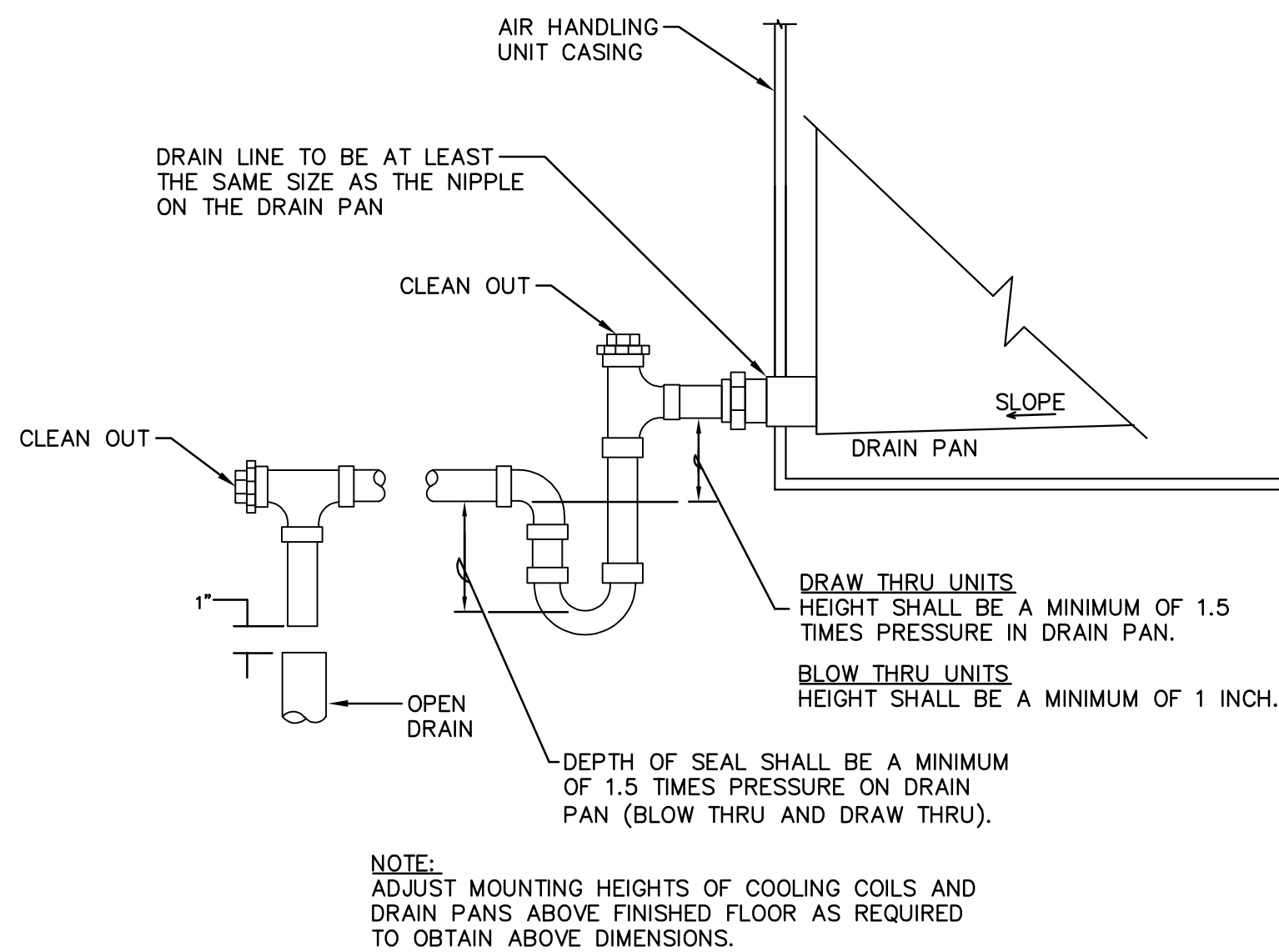
4 SCALE: NONE




5 SCALE: NONE



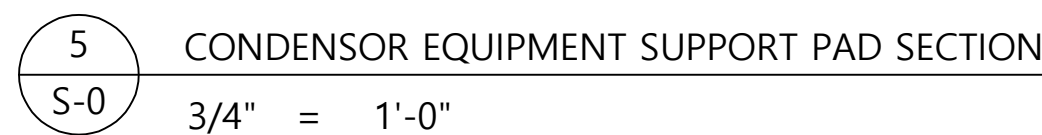
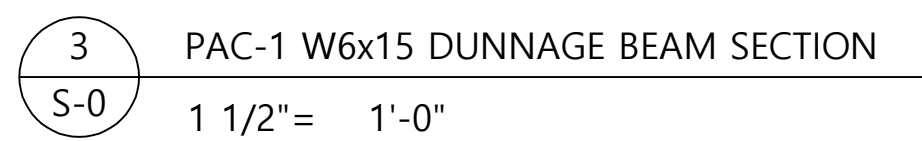
**SCALE: NTS**



9 SCALE: NONE

12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
 <p><b>Southport</b> Engineering Associates, PC</p> <p>11 BAILEY AVENUE RIDGEFIELD, CT 06877</p> <p>TEL: 203-431-6844 FAX: 203-431-6877</p>			
PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE: MECHANICAL SCHEDULES AND DETAILS			
SCALE:	AS NOTED	DRAWN BY:	JCP DRAWING NO:
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	BU
			M-400

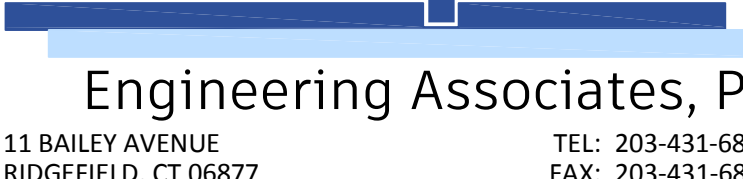




6 CONDENSER EQUIPMENT SUPPORT PAD SECTION  
S-0 3/4" = 1'-0"



## MPA PROJECT No. 22/6183

12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
 <p><b>Southport</b> Engineering Associates, PC</p> <p>11 BAILEY AVENUE TEL: 203-431-6844 RIDGEFIELD, CT 06877 FAX: 203-431-6877</p>			
PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE:  MECHANICAL DETAILS CONTINUED			
SCALE:	AS NOTED	DRAWN BY:	JCP DRAWING NO:
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	BU
			<b>M-401</b>



CONTROL SPECIFICATION

1.0 GENERAL

1.1 WORK INCLUDED

- A. THE WORK INCLUDES INSTALLATION OF DIRECT DIGITAL CONTROLS AS SPECIFIED IN THESE SPECIFICATIONS AND AS NOTED ON OTHER PROJECT DRAWING AND SHALL EXECUTED AND PROVIDED BY CONTROLS CONTRACTOR. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL HVAC COMPONENTS AND COORDINATE WITH CONTROLS CONTRACTOR FOR VOLTAGE AND TRANSFORMERS REQUIREMENTS.
- B. LOW VOLTAGE WIRING BY CONTROLS CONTRACTOR.

1.2 GENERAL REQUIREMENTS

- A. PROVIDE SERESCO CONTROL SYSTEM WITH BACNET FOR INTERFACE WITH NETWORK DEVICES.
- B. DIRECT DIGITAL CONTROLLERS (DDCS) WHICH ALLOW CUSTOM PROGRAMMING SHALL BE USED FOR ALL CONTROL APPLICATIONS. UNITARY CONTROLLERS, APPLICATION SPECIFIC CONTROLLERS AND CONTROLLERS WHICH LIMIT THE NUMBER OF CONTROL LOOPS AND FUNCTIONS SHALL NOT BE USED EXCEPT AS NOTED OTHERWISE.
- C. A MINIMUM OF 2 SPARE POINTS OF EACH TYPE SHALL BE INSTALLED IN NEW DDC CONTROLLERS. WHERE A DDC PANEL(S) IS INSTALLED WITHIN A CONTRACTOR SUPPLIED ENCLOSURE THE ENCLOSURE MUST BE SIZED TO ALLOW THE ADDITION OF AT LEAST ONE POINT EXPANSION MODULE.
- D. CONNECTIONS FROM DDC CONTROLLER TO ITS FIELD DEVICES SHALL BE WITH BARRIER TYPE TERMINAL STRIPS.
- E. IDENTIFY ALL EQUIPMENT INTERNAL TO PANEL OR FACE MOUNTED WITH NAMEPLATES TO MATCH APPROVED SHOP DRAWINGS.
- F. THE CONTRACTOR SHALL WARRANTY THE CONTROLS TO BE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIAL FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
- G. THE OWNER SHALL NOT BE RESTRICTED IN THE USE AND MODIFICATIONS OF ALL SOFTWARE INSTALLED FOR THIS PROJECT. COPYRIGHTING OR OTHER RESTRICTIONS, BY THE CONTRACTOR, ON THE ACCESS, BY THE OWNER, TO THE INSTALLED SOFTWARE SHALL BE PROHIBITED.
- H. DEMOLITION: UNUSED CONTROLS, CONTROL DEVICES, WIRING, TUBING AND CONTROL PANELS SHALL BE REMOVED.

1.3 SUBMITTALS

- A. SUBMIT THREE HARD COPIES AND ONE SOFT COPY (PDF) OF THE SUBMITTALS INDICATED BELOW. INDICATE AT THE BEGINNING OF EACH SUBMITTAL, KNOWN SUBSTITUTIONS AND DEVIATIONS FROM REQUIREMENTS OF CONTRACT DOCUMENTS.
- B. SHOP DRAWING SUBMITTALS TO INCLUDE SUFFICIENT DATA TO INDICATE COMPLETE COMPLIANCE WITH CONTRACT DOCUMENTS. SUBMISSIONS IN FORM OF DRAWINGS, BROCHURES, BULLETINS, CATALOG DATA, CONTROL PROGRAMMING AND SEQUENCE OF OPERATIONS. DRAWING SIZE, 11" X 17" MINIMUM.
- C. FINAL CALIBRATION, COMMISSIONING AND TESTING REPORTS.
- D. PREPARE AS-BUILT DRAWINGS UPON COMPLETION OF THE PROJECT. AS-BUILT DRAWINGS TO INCLUDE POINT-TO-POINT WIRING, AND INDICATE ALL EQUIPMENT LOCATIONS.

2.0 PRODUCTS

2.1 SENSORS AND CONTROL DEVICES

- A. GENERAL
1. PROVIDE SENSORS AND CONTROL DEVICES AS INDICATED ON DEVICE SCHEDULE PLANS, CONTROL DIAGRAMS AND AS REQUIRED TO MEET SPECIFIED PERFORMANCE.
2. ALL COMPONENTS OF SENSORS EXPOSED TO PROCESS SHALL BE RATED TO WITHSTAND 150 PERCENT OF MAXIMUM PROCESS TEMPERATURE AND PRESSURE.
- B. TEMPERATURE SENSORS
1. TEMPERATURE SENSOR ACCURACY SHALL NOT EXCEED  $\pm 1.0^{\circ}\text{F}$ .
2. OUTSIDE AIR SENSORS SHALL BE MOUNTED ON A NORTHERN EXPOSURE AND MOUNTED WITHIN A VENTILATED ENCLOSURE.
3. IMMERSION SENSORS SHALL BE PROVIDED WITH A SEPARABLE STAINLESS STEEL OR BRASS WELL.
- C. CURRENT RELAY: SHALL BE SPLIT CORE, ADJUSTABLE SETPOINT, CURRENT SENSING RELAY WITH SPDT OUTPUT CONTACTS

2.2 SOFTWARE

- A. GRAPHICS: EACH SYSTEM CONTROLLED SHALL HAVE A UNIQUE GRAPHIC.

3.0 EXECUTION

3.1 LOCATION OF EQUIPMENT

- A. THE DRAWINGS AND SPECIFICATIONS DESCRIBE APPROXIMATE LOCATIONS OF THE WORK. VERIFY ALL LOCATIONS IN THE FIELD.
- B. LOCATE EQUIPMENT AND ACCESSORIES SO AS TO PROVIDE EASY ACCESS FOR PROPER SERVICE AND MAINTENANCE.
- C. DIRECT DIGITAL CONTROLLERS AND FIELD EQUIPMENT PANELS SHALL BE LOCATED IN THE VICINITY OF THE EQUIPMENT CONTROLLED IN MECHANICAL, ELECTRICAL AND UTILITY ROOMS IN APPROVED LOCATIONS.
- D. DDCS AND FEPS SHALL NOT BE LOCATED DIRECTLY UNDERNEATH VALVES OR OTHER AREAS WHERE THEY MAY BE SUBJECT TO WATER OR HEAT DAMAGE. IN ADDITION, PANELS SHALL BE MOUNTED WITH THE BOTTOM NO LOWER THAN 3 FEET AND TOP NO HIGHER THAN 7 FEET ABOVE THE FLOOR, WITH A MINIMUM OF 3 FEET DEEP BY 2.5 FEET WIDE FOOT CLEARANCE AT THE FRONT.

3.2 INSTALLATION OF WIRING

- A. PROVIDE CONTROL WIRING FOR CONTROL DEVICES, MONITORING DEVICES, INSTRUMENTATION, AND INTERLOCKS AS REQUIRED FOR A COMPLETE SYSTEM.
- B. RUN ALL WIRING IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AUTHORITIES AND CODES HAVING JURISDICTION. ALL WIRING WITHIN BOILER ROOM AND PUMP ROOMS, AND OTHER EXPOSED AREAS TO BE INSTALLED IN CONDUIT.
- C. PROVIDE SLEEVES FOR WIRING THROUGH FIRE RATED WALLS AND FLOORS. FIRESTOP TO MAINTAIN WALL AND FLOOR RATINGS.
- D. WIRING LESS THAN 50 VOLTS SHALL NOT BE RUN IN THE SAME RACEWAY WITH WIRING GREATER THAN 50 VOLTS.
- E. WHERE LOW VOLTAGE WIRING IS INSTALLED WITHIN AN ENCLOSURE WITH 120V OR GREATER VOLTAGE WIRING, THHN 600V INSULATED WIRING SHALL BE USED FOR WIRING LOW VOLTAGE.
- F. USE GREENFIELD FOR FINAL CONNECTIONS TO VALVES, MOTORS, ETC.
- G. CONNECTIONS FROM DDC CONTROLLER TO ITS FIELD DEVICES SHALL BE WITH BARRIER TYPE TERMINAL STRIPS.
- H. CONDUITS SHALL BE SEALED WHERE SUBJECT TO MOISTURE AND CONDENSATION SUCH AS CONNECTION TO COLD WATER VALVE ACTUATORS, COOLING TOWERS, OUTSIDE WALLS AND EQUIPMENT IN UNCONDITIONED SPACES.
- I. COLOR CODE OR NUMBER ALL CONTROL WIRING. CODING SHALL CORRESPOND WITH CODING SHOWN ON THE APPROVED TEMPERATURE CONTROL SYSTEM DRAWINGS.
- J. ALL WIRES IN HVAC UNIT CONTROL CABINETS, PANELS, BOXES, ETC., SHALL BE NEATLY ARRANGED, TIED WHERE NECESSARY AND LEFT WITH SUFFICIENT SLACK FOR EASE OF SERVICING. WIRES SHALL BE NEATLY GROUPED AND BUNDLED. FOR WIRING BUNDLES WITH 20 OR MORE CONDUCTORS RUN IN PANDUIT OR APPROVED PLASTIC WIREWAYS WITH SNAP-ON COVERS. SEPARATE TERMINAL BLOCKS SHALL BE INSTALLED FOR 120 VOLT A.C. WIRING AND FOR LOW LEVEL SIGNAL WIRING. TERMINAL BLOCKS SHALL BE 300 VOLT RATED, MEDIUM DUTY, CHANNEL MOUNTED, WITH NUMBERED MARKING STRIPS. SPLICES USING "WIRE NUTS" OR OTHER METHODS SHALL NOT BE PERMITTED.
- L. CONTROLS TRANSFORMERS SHALL HAVE SERVICE SWITCHES AND BE FUSED ON THE HIGH VOLTAGE SIDE.

3.3 INSTALLATION OF SENSORS AND CONTROL DEVICES

- A. EACH DDC, UC, AND CONTROL DEVICE, FIELD OR PANEL MOUNTED, SHALL BE IDENTIFIED BY A NAMEPLATE PERMANENTLY ATTACHED TO ITS ENCLOSURE (1/4" HIGH LETTERS MINIMUM). IDENTIFIERS SHALL MATCH RECORD DOCUMENTS.

- B. PROVIDE CAPPED TEST PORTS ON BOTH PORTS OF PRESSURE AIR AND WATER TRANSDUCERS

- C. CURRENT SENSORS SHALL BE SET AT APPROXIMATELY 75% OF THE NORMAL OPERATING AMPS.

3.4 TRAINING

- A. THE CONTRACTOR SHALL GIVE INSTRUCTION IN THE ADJUSTMENT, OPERATION AND MAINTENANCE, INCLUDING PERTINENT SAFETY REQUIREMENTS, OF THE EQUIPMENT AND SYSTEM INSTALLED. THREE TRAINING SESSIONS SHALL BE PROVIDE WITH A MINIMUM OF 8 HOURS TOTAL.

3.5 CALIBRATION AND COMMISSIONING

- A. PERFORM COMMISSIONING CONSISTING OF FIELD I/O CALIBRATION AND COMMISSIONING, SYSTEM PROGRAM COMMISSIONING, AND SEASONAL COMMISSIONING. DOCUMENT ALL COMMISSIONING INFORMATION ON COMMISSIONING DATA SHEETS THAT SHALL BE SUBMITTED PRIOR TO ACCEPTANCE TESTING.

3.6 AUTOMATIC CONTROL PROGRAMS AND SEQUENCES

A. GENERAL

1. ALL CONTROL AND ALARM FUNCTIONS WHICH USE ANALOG POINTS TO SWITCH EQUIPMENT ON AND OFF (E.G., FANS, PUMPS) MUST BE PROGRAMMED WITH DEAD BANDS, TIME DELAYS, MINIMUM ON AND ON TIME FUNCTIONS AND/OR OTHER FUNCTIONS TO PREVENT SHORT CYCLING OF EQUIPMENT AND NUISANCE ALARMS.
2. DEGRADED MODE: IF, BY FAILURE OF ANOTHER DDC, SENSOR OR SYSTEM COMPONENT WHICH CAUSES INFORMATION CRITICAL TO A DDC'S PROGRAM TO BE LOST, DEFAULT VALUES OR SUBROUTINES WILL AUTOMATICALLY BE USED TO APPROXIMATE CRITICAL INFORMATION TO ENSURE CONTINUED CONTROL.
3. WHERE HEATING AND COOLING IS AVAILABLE TO A TEMPERATURE CONTROL ZONE THE ZONE SHALL BE PROVIDED WITH A MINIMUM OF 5 DEGREE DEADBAND BETWEEN OPERATION OF HEATING AND COOLING SUPPLIED TO THE ZONE (EXCEPTION: LOW OR HIGH LIMIT CONTROL FUNCTIONS).

B. WATER COOLED/HEATING SPLIT DEHUMIDIFIER (PAC-1)

1. REFER POOL DIAGRAM THIS PAGE.

C. EXISTING MEZZANINE EXHAUST FAN (MEF-1)

1. UPON TEMPERATURE IS ABOVE ITS SETPOINT THE INTAKE DAMPER (DC-3) SHALL OPEN AND THE EXHAUST FAN SHALL RUN CONTINUOUSLY. UPON TEMPERATURE ACHIEVE ITS SETPOINT THE FAN SHALL SHUT-OFF AND THE INTAKE DAMPER SHALL CLOSE. REFER TO PAC-1 CONTROLS DIAGRAM FOR INTAKE DAMPER DC-3 LOCATION

DEVICE SCHEDULE - DESCRIPTIONS

THE FOLLOWING DEVICE SCHEDULE IDENTIFIES THE MINIMUM MONITORING AND CONTROL DEVICE REQUIREMENTS. ADDITIONAL HARDWARE AND SOFTWARE REQUIRED TO PERFORM THE AUTOMATIC CONTROL SEQUENCES AND PROVIDE A COMPLETE WORKING CONTROL SYSTEM SHALL BE INCLUDED BY THIS CONTRACTOR WITHOUT ADDITIONAL COST.

POINT TYPE

DO - DIGITAL OUTPUT  
DI - DIGITAL INPUT  
AO - ANALOG OUTPUT  
AOP - ANALOG OUTPUT - PNEUMATIC  
AI - ANALOG INPUT  
CALC - CALCULATED POINT

POINT FUNCTIONS - INDICATES THE MINIMUM REQUIRED FMCS PROCESSING AND ALARM FUNCTIONS.

PRF (PROOF ALARM) - IF THE STATUS OF THE CONTROLLED DEVICE DOES NOT MATCH THE COMMANDED STATE OF THE DEVICE, AFTER AN ADJUSTABLE TIME DELAY, A PROOF ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

ALM (ALARM) - WHENEVER THE POINT CHANGES FROM THE NORMAL STATE AN ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

HA (HIGH ALARM) - WHENEVER THE POINT VALUE EXCEEDS THE HIGH ALARM LIMIT AN ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

LA (LOW ALARM) - WHENEVER THE POINT VALUE FALLS BELOW THE LOW ALARM LIMIT AN ALARM SHALL BE ANNUNCIATED AT THE OPERATORS TERMINAL.

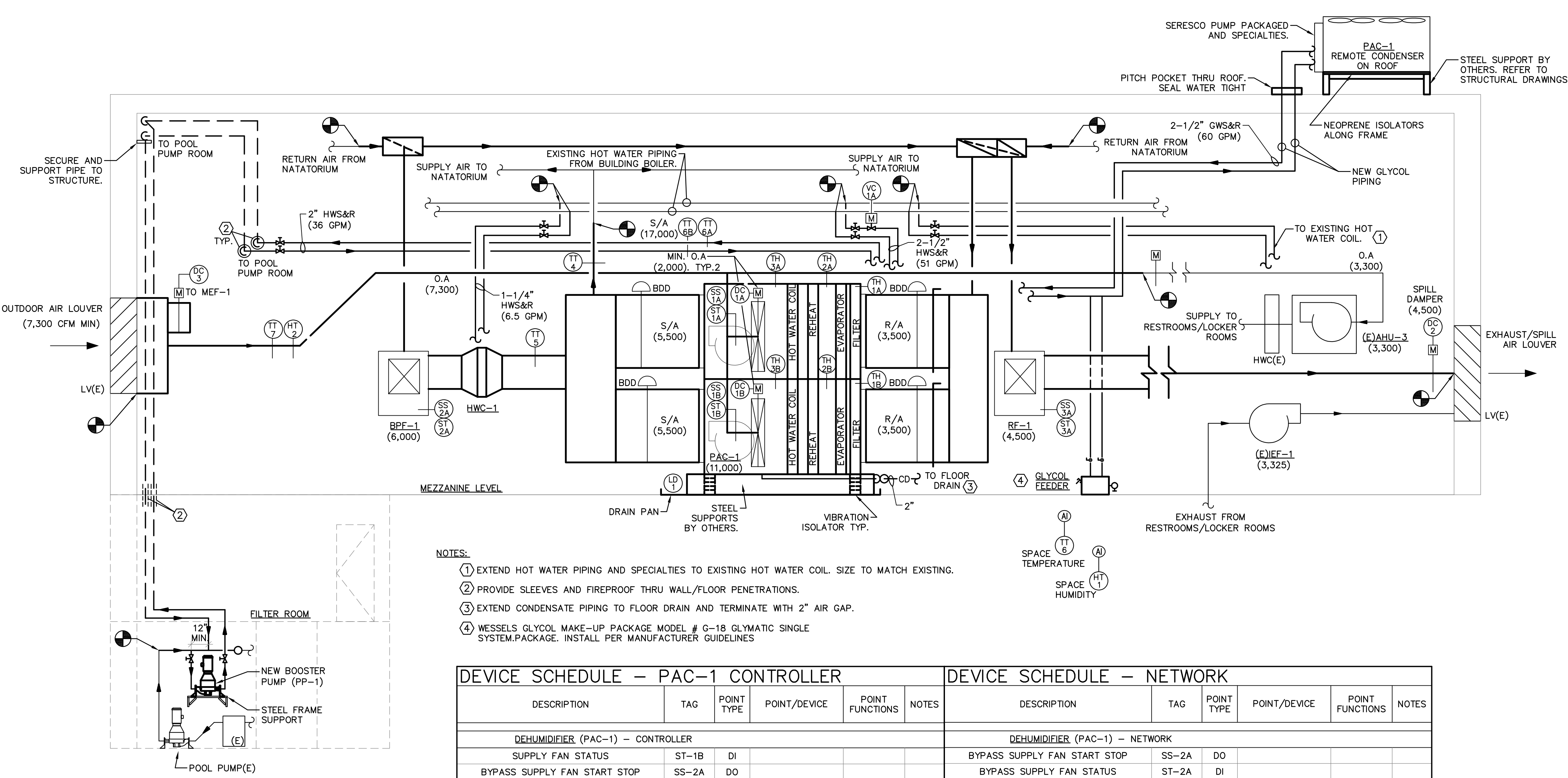
DEV (SETPOINT DEVIATION ALARM) - IF THE MEASURED VARIABLE OF A CONTROL LOOP DEVIATES FROM THE SETPOINT BY A PRESET OFFSET FOR MORE THAN A PRESET TIME LIMIT A DEVIATION ALARM SHALL BE ANNUNCIATED AT THE OPERATOR'S TERMINAL.

RT (RUN HOURS) - TOTALIZE THE HOURS OF OPERATION OF THE CONTROLLED DEVICE. WHEN THE TOTAL HOURS EXCEEDS A HIGH LIMIT VALUE AN ALARM SHALL BE ANNUNCIATED AT THE OPERATOR'S TERMINAL.

TOT (TOTAL) - TOTALIZE THE CUMULATIVE VALUE OF THE POINT (I.E., CUMULATIVE FLOW FROM A FLOW METER POINT).

PA (PULSE ACCUMULATE) - COUNT A PULSED DIGITAL SIGNAL AND CALCULATE AN EQUIVALENT ANALOG VALUE.

CALC (CALCULATE) - CALCULATE VALUE FROM OTHER POINT INFORMATION.



NOTES:

- ① EXTEND HOT WATER PIPING AND SPECIALTIES TO EXISTING HOT WATER COIL. SIZE TO MATCH EXISTING.
- ② PROVIDE SLEEVES AND FIREPROOF THRU WALL/FLOOR PENETRATIONS.
- ③ EXTEND CONDENSATE PIPING TO FLOOR DRAIN AND TERMINATE WITH 2" AIR GAP.
- ④ WESSELS GLYCOL MAKE-UP PACKAGE MODEL # G-18 GLYMATIC SINGLE SYSTEM PACKAGE. INSTALL PER MANUFACTURER GUIDELINES

DEVICE SCHEDULE - PAC-1 CONTROLLER

DESCRIPTION	TAG	POINT TYPE	POINT/DEVICE	POINT FUNCTIONS	NOTES
DEHUMIDIFIER (PAC-1) - CONTROLLER					
SUPPLY FAN STATUS	ST-1B	DI			
BYPASS SUPPLY FAN START STOP	SS-2A	DO			
BYPASS SUPPLY FAN STATUS	ST-2A	DI			
RETURN AIR TEMPERATURE/HUMIDITY	TT-1A	AI		RT, PRF	
RETURN AIR TEMPERATURE/HUMIDITY	TT-1B	AI		RT, PRF	
EVAPORATOR DISCHARGE TEMPERATURE	TT-2A	AI		RT, PRF	
EVAPORATOR DISCHARGE TEMPERATURE	TT-2B	AI		RT, PRF	
SUPPLY DISCHARGE AIR TEMPERATURE	TT-4	AI		RT-PRF	
HOT WATER COIL VALVE	VC-1A	AO			1
CONDENSER WATER VALVE	VC-2	AO			1
MINIMUM OUTSIDE AIR DAMPER CONTROL	DC-1A	AO			
MINIMUM OUTSIDE AIR DAMPER CONTROL	DC-1B	AO			

NOTES:

GENERAL NOTE: ALL CONTROLS SHALL BE NEW.

1. NEW VALVES PROVIDED BY CONTROLS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
2. PROVIDE ONE SET ONLY.
3. LOCATION TO BE DETERMINED DURING PROJECT INSTALLATION.
4. LOW SPACE TEMPERATURE AND ALARMS TO BE TIED INTO NETWORK SYSTEM

DEVICE SCHEDULE - NETWORK

DESCRIPTION	TAG	POINT TYPE	POINT/DEVICE	POINT FUNCTIONS	NOTES
DEHUMIDIFIER (PAC-1) - NETWORK					
BYPASS SUPPLY FAN START STOP	SS-2A	DO			
BYPASS SUPPLY FAN STATUS	ST-2A	DI			
SPILL FAN START STOP	SS-3A	DO			
SPILL FAN STATUS	ST-3A	DI			
MIXED AIR TEMPERATURE	TT-3A	AI		RT, PRF	
MIXED AIR TEMPERATURE	TT-3B	AI		RT, PRF	
BYPASS DISCHARGE AIR TEMPERATURE	TT-5	AI		RT, PRF	
SPACE AIR TEMPERATURE	TT-6	AI		HA, LA	4
SPILL AIR DAMPER CONTROL	DC-2	AO			
SPACE HUMIDITY	HT-1	AI		HA	
MISC. DEVICES					
OUTSIDE AIR TEMPERATURE	TT-7	AI			2, 3
OUTSIDE AIR HUMIDITY	HT-2	AI			2, 3
LEAK DETECTOR	LD-1	DI		ALM	4

NOTES:

GENERAL NOTE: ALL CONTROLS SHALL BE NEW.

1. NEW VALVES PROVIDED BY CONTROLS CONTRACTOR AND INSTALLED BY MECHANICAL CONTRACTOR.
2. PROVIDE ONE SET ONLY.
3. LOCATION TO BE DETERMINED DURING PROJECT INSTALLATION.
4. LOW SPACE TEMPERATURE AND ALARMS TO BE TIED INTO NETWORK SYSTEM

GENERAL SEQUENCE OF OPERATION

THE DEHUMIDIFIER PAC-1, BYPASS FAN BPF-1 AND RELIEF FAN RF-1 SHALL BE STARTED/STOPPED BY ITS LOCAL CONTROLLER. IF THE PAC-1 SUPPLY AIR FAN AND RELIEF FANS ARE NOT IN OPERATION THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.

OCCUPIED MODE: THE OUTDOOR/SPILL AIR DAMPERS SHALL OPEN, THE PAC-1 SUPPLY FANS, BYPASS SUPPLY FAN BPF-1 AND RELIEF FAN RF-1 SHALL BE STARTED RUN AND THE PAC-1 CONTROLLER SHALL MODULATE TO MAINTAIN TEMPERATURE AND HUMIDITY SETPOINTS. UPON SPACE TEMPERATURE IS BELOW ITS SETPOINT, THE 1ST HEATING STAGE VIA PAC-1 HOT WATER COILS CONTROLS SHALL BE ENERGIZED TO MAINTAIN SPACE TEMPERATURE (82°F ADJ.) AND HUMIDITY SETPOINTS. UPON SPACE TEMPERATURE DROPS 2°F BELOW SETPOINT THE BYPASS SUPPLY FAN HOT WATER COIL SHALL BE ENABLE TO MAINTAIN SPACE SETPOINT.

UNOCCUPIED MODE: THE RELIEF FAN SHALL SHUT-OFF AND THE OUTDOOR/SPILL DAMPERS SHALL REMAIN CLOSED. THE DEHUMIDIFIER PAC-1 AND BYPASS SUPPLY FAN BPF-1 FAN SHALL OPERATE AS DESCRIBED ABOVE MAINTAINING SPACE SETPOINT (82°F ADJ.), E HEATING VIA PERIMETER STEAM RADIATORS.

POOL WATER TEMPERATURE: THE POOL WATER TEMPERATURE IS COMPARED TO IS SETPOINT AND POOL HEATING IS PROVIDED IF REQUIRED.

EMERGENCY MODES:

1. UPON MIXED AIR TEMPERATURE IS BELOW ITS SETPOINT 40°F ADJ. THE PAC-1 OUTDOOR DAMPER SHALL CLOSE, THE HOT WATER VALVE SHALL OPEN AND AUDIBLE ALARM SHALL BE INITIATED. MANUAL RESET TO OCCUPY MODE OPERATION.
2. UPON SAFETY FLOAT SWITCH IS ABOVE ITS LEVEL THE PAC-1 SUPPLY FAN SHALL SHUT OFF WITH AUDIBLE AND NOTIFICATION ALARM.
3. SMOKE DETECTOR: WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, THE UNIT WILL SHUTOFF AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. THE OUTSIDE/RELIEF AIR DAMPER SHALL CLOSE AND THE BYPASS SUPPLY FAN BPF-1 AND RELIEF FAN RF-1 ASSOCIATED WITH THE UNIT SHALL BE TURNED OFF.
4. LEAK DETECTOR SHALL CLOSE ALL VALVES, DAMPERS, SHUT DOWN PAC-1, BYPASS SUPPLY FAN AND RELIEF FAN UNITS WITH AUDIBLE AND NOTIFICATION ALARM.

TYPICAL DEHUMIDIFIER CONTROL DIAGRAM

(PAC-1)

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DATE	REV	DESCRIPTION	BY
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PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE: MECHANICAL CONTROLS			
SCALE:	AS NOTED	DRAWN BY: JCP	DRAWING NO:
DATE:	11/15/22	CHECKED BY: BU	
PROJECT NO:	414003	APPROVED BY: BU	M-500



ELECTRICAL DRAWING LIST		
E-100	~	ELECTRICAL LEGENDS, NOTES AND SPECIFICATIONS
E-101	~	ELECTRICAL SPECIFICATIONS AND DETAILS
E-200	~	ELECTRICAL DEMOLITION PART PLAN ~ UPPER MECHANICAL AREA
E-300	~	ELECTRICAL POWER PART PLAN ~ UPPER MECHANICAL AREA

ELECTRICAL GENERAL SYMBOLS AND ABBREVIATIONS	
	JUNCTION BOX
	JUNCTION BOX WITH BLANK FACEPLATE
	CONTROL WIRING IN CONDUIT
	EMERGENCY BRANCH CIRCUIT IN CONDUIT
	BRANCH CIRCUIT IN CONDUIT CONCEALED BELOW FLOOR SLAB
	BRANCH CIRCUIT IN FLEXIBLE CONDUIT
	BRANCH CIRCUIT IN CONDUIT ~ HOT LEG, SWITCH LEG, NEUTRAL AND EQUIPMENT GROUND, RESPECTIVELY
	BRANCH CIRCUIT HOMERUN ~ PANEL AND SPACE AS INDICATED ON DRAWINGS
	EXISTING EQUIPMENT/WIRE TO BE REMOVED
	EXISTING EQUIPMENT/WIRE TO REMAIN
	NEW EQUIPMENT/WIRE
AFF	ABOVE FINISHED FLOOR
BFF	BELOW FINISHED FLOOR
ER	EXISTING TO REMAIN
RE	RELOCATED EXISTING
TBD	TO BE DETERMINED
UG	UNDERGROUND
WP	WEATHER-PROOF

ELECTRICAL POWER & SYSTEMS SYMBOLS AND ABBREVIATIONS	
	SIMPLEX RECEPTACLE, WALL MOUNTED ~ TYPE AS INDICATED ON DRAWINGS
	DUPLEX RECEPTACLE, WALL MOUNTED
	DUPLEX RECEPTACLE, RECESSED MOUNTED IN WALL
	DUPLEX RECEPTACLE, FLUSH MOUNTED IN FLOOR
	DUPLEX RECEPTACLE, FLUSH MOUNTED IN CEILING
	QUADRUPLEX RECEPTACLE, WALL MOUNTED
	VOICE AND/OR DATA OUTLET, WALL MOUNTED
	VOICE AND/OR DATA OUTLET, FLUSH MOUNTED IN FLOOR
	VOICE AND/OR DATA OUTLET, FLUSH MOUNTED IN CEILING
	POKE-THRU DEVICE, FLUSH MOUNTED IN FLOOR ~ PROVIDE WITH DEVICES AS INDICATED ON DRAWINGS OR POWER AND VOICE/DATA CONNECTIONS AS REQUIRED
	TELEVISION OUTLET, WALL MOUNTED
	HANDICAPPED PUSH BUTTON FOR MOTORIZED DOOR
	DOORBELL SYSTEM PUSH BUTTON
	DOORBELL SYSTEM AUDIO AND/OR VISUAL DEVICE
	EMERGENCY POWER-OFF PUSH BUTTON
	CONTACTOR
	LOW-VOLTAGE TRANSFORMER
	NONFUSED DISCONNECT SWITCH ~ TYPE AND SIZE AS INDICATED ON DRAWINGS
	FUSED DISCONNECT SWITCH ~ TYPE AND SIZE AS INDICATED ON DRAWINGS
	COMBINATION MOTOR STARTER AND NONFUSED DISCONNECT SWITCH ~ TYPE AND SIZE AS INDICATED ON DRAWINGS
	MOTOR STARTER ~ TYPE AND SIZE AS INDICATED ON DRAWINGS
	DOUBLE-POLE, DOUBLE-THROW SWITCH FOR RAISE/LOWER CONTROL OF MOTORIZED PROJECTION SCREEN ~ LOWERCASE LETTER INDICATES CONTROLLED SCREENS
	MANUAL MOTOR STARTER, TOGGLE-OPERATED WITH THERMAL OVERLOADS SIZED PER MANUFACTURER'S SPECIFICATIONS
	VARIABLE FREQUENCY DRIVE ~ BY OTHERS
	ELECTRIC MOTOR ~ "H" INDICATES HORSEPOWER RATING, "MD" INDICATES MOTORIZED DOOR AND "PS" INDICATES PROJECTION SCREEN
	FUSE
	SWITCH
	CIRCUIT BREAKER
	DRAW-OUT TYPE CIRCUIT BREAKER
	METER WITH CURRENT TRANSFORMERS
	METER
	GROUND BAR
	EXISTING PANELBOARD/LOADCENTER, FLUSH MOUNTED
	NEW PANELBOARD/LOADCENTER, FLUSH MOUNTED
	EXISTING PANELBOARD/LOADCENTER, SURFACE MOUNTED
	NEW PANELBOARD/LOADCENTER, SURFACE MOUNTED
	EXISTING DISTRIBUTION PANELBOARD, SURFACE MOUNTED
	NEW DISTRIBUTION PANELBOARD, SURFACE MOUNTED
GFI	GROUND-FAULT CIRCUIT INTERRUPTING TYPE DEVICE

FIRE ALARM SYMBOLS	
	BUILDING STANDARD AUDIO/VISUAL DEVICE, WALL MOUNTED ADA COMPLIANT ~ FIELD-SELECTABLE MULTI-TAP AND MULTI-CANDELA TYPE UNLESS NOTED OTHERWISE
	BUILDING STANDARD PULL STATION
	BUILDING STANDARD AREA SMOKE DETECTOR, CEILING MOUNTED
	BUILDING STANDARD DUCT SMOKE DETECTOR
ER	EXISTING TO REMAIN
N	NEW
RE	RELOCATED EXISTING

## ELECTRICAL SPECIFICATIONS

### A. GENERAL ~ 260100:

- PROVIDE LABOR, MATERIALS, EQUIPMENT AND SERVICES FOR THE COMPLETION OF ELECTRICAL SYSTEMS AS SHOWN ON THESE DRAWINGS AND AS REQUIRED BY THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC), STATE AND LOCAL CODES, AND OSHA REGULATIONS. THE CONTRACTOR SHALL PAY ALL FEES, AND OBTAIN ALL CERTIFICATES AND INSPECTIONS.
- NON-COMPLIANCE: SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY WITH THE REQUIREMENTS OF APPLICABLE BUILDING CODES, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, AND UTILITY COMPANY REGULATIONS; HE SHALL BEAR ALL COSTS ARISING IN CORRECTING THE DEFICIENCIES.
- IN CASE OF DIFFERENCE BETWEEN BUILDING CODES, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, UTILITY COMPANY REGULATIONS, THESE SPECIFICATIONS AND THE CONTRACT DRAWINGS, THE STRICTEST SHALL PREVAIL. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER IN WRITING OF ANY SUCH DIFFERENCE.
- ALL EQUIPMENT SHALL BE NEW AND UNUSED; AND SHALL BE "UL" LISTED AND BEAR THE "UL" LABEL.
- ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. ALL MATERIALS SHALL BE OF THE BEST QUALITY FOR PURPOSE INTENDED. TRADE NAMES AND CATALOG NUMBERS ARE INTENDED TO INDICATE THIS QUALITY AND GRADE. OBTAIN WRITTEN APPROVAL FROM THE OWNER FOR ANY SUBSTITUTIONS MADE AFTER ACCEPTANCE OF SUBMITTAL FOR ANY ITEM.
- ON ACCEPTANCE OF CONTRACT, THE CONTRACTOR AGREES TO GUARANTEE ALL WORK AND EQUIPMENT FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM DATE OF INITIAL OPERATION. MANUFACTURED EQUIPMENT SHALL CARRY FULL PERIOD OF THE MANUFACTURER'S GUARANTEE AND SHALL NOT BE LESS THAN ONE (1) YEAR.
- PRIOR TO SUBMISSION OF BID, THE CONTRACTOR SHALL VISIT THE JOB SITE TO ASCERTAIN ACTUAL FIELD CONDITIONS AS THEY RELATE TO THE WORK IN THESE SPECIFICATIONS AND DRAWINGS. ANY DISCREPANCIES SHALL BE BROUGHT TO ATTENTION OF THE ARCHITECT AND/OR ENGINEER AT THIS TIME. ALL ITEMS NOT RESOLVED PRIOR TO BID SHALL BE INCLUDED AS WRITTEN QUALIFICATIONS TO THE BID DOCUMENT. SUBMISSION OF BID SHALL BE EVIDENCE THAT VERIFICATION OF THE JOB SITE HAS BEEN PERFORMED.
- THE GENERAL CONTRACTOR SHALL PERFORM ALL CUTTING, CORE DRILLING, SLAB PENETRATIONS, TRENCHING, ETC. NECESSARY FOR PROPER INSTALLATION OF ELECTRICAL WORK. THE CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR AS REQUIRED TO INCLUDE ALL WORK IN THE BID SUBMISSION.
  - WHERE FLOOR PENETRATIONS ARE REQUIRED, FLOOR SLABS SHALL BE X-RAYED PRIOR TO THE START OF ANY WORK. COORDINATE SCHEDULING OF THIS WORK WITH THE ARCHITECT AND BUILDING MANAGEMENT.
  - ALL LOCATIONS SHALL BE FIELD COORDINATED WITH THE ARCHITECT AND/OR BUILDING MANAGEMENT; AND SHALL BE APPROVED BY THE BUILDING STRUCTURAL ENGINEER PRIOR TO START OF WORK.
  - COORDINATE WITH THE BUILDING MANAGEMENT TO ENSURE INTEGRITY OF FLOOR SLABS IS MAINTAINED. PROVIDE ALL STRUCTURAL SUPPORTS AS DIRECTED BY THE BUILDING STRUCTURAL ENGINEER IF REQUIRED.
- OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE FIRE-STOPPED USING APPROVED METHODS. ACCEPTABLE MANUFACTURERS ARE HILTI AND 3M BUT MATERIAL MUST BE APPROVED BY THE LOCAL AUTHORITY HAVING JURISDICTION.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL ELECTRICAL INSTALLATIONS THAT ARE WITHIN CLOSE PROXIMITY OF OTHER TRADES. CONDUIT SHALL BE INSTALLED AS HIGH AS POSSIBLE ABOVE FINISHED CEILING TO AVOID CONFLICTS WITH OTHER TRADES. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION.
- COVER LIGHT FIXTURES, EQUIPMENT, APPARATUS, ETC. TO PROTECT AGAINST CHEMICAL, WATER, DIRT OR MECHANICAL DAMAGE BEFORE AND DURING THE CONSTRUCTION PERIOD UNTIL THE FINAL ACCEPTANCE. ALL EQUIPMENT SHALL BE DELIVERED, PROPERLY PACKED AND STORED AT THE JOB SITE UNTIL FINAL INSTALLATION.
- THE CONTRACTOR SHALL REPAIR ANY DAMAGE DONE BY HIMSELF OR HIS WORKMEN. RESTORE TO ORIGINAL CONDITION ANY APPARATUS, EQUIPMENT OR SURFACE DAMAGED UNDER THIS SCOPE OF WORK PRIOR TO FINAL ACCEPTANCE, INCLUDING RESTORATION OF DAMAGES TO SHOP COATS OF PAINT.
- IT IS THE INTENT OF THESE SPECIFICATIONS AND DRAWINGS TO REQUIRE AN INSTALLATION THAT IS CORRECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL IN THESE SPECIFICATIONS AND DRAWINGS. IF AN ITEM OF WORK IS SHOWN ON THE DRAWINGS, IT SHALL BE CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT THAT IS NECESSARY FOR COMPLETE INSTALLATION WHETHER SPECIFICALLY MENTIONED OR NOT.
- THE DRAWINGS FOR ELECTRICAL WORK UTILIZE SYMBOLS AND SCHEMATIC DIAGRAMS WHICH HAVE NO DIMENSIONAL SIGNIFICANCE. THE WORK SHALL BE INSTALLED TO FULFILL THE DIAGRAMMATICAL INTENT EXPRESSED ON THE DRAWINGS AND IN CONFORMITY WITH DIMENSIONS INDICATED ON FINAL WORKING DRAWINGS, FIELD LAYOUTS AND SHOP DRAWINGS FROM ALL TRADES.
- PROVIDE TO THE OWNER, A COMPLETE SET OF REPRODUCIBLE AS-BUILT DRAWINGS ON AUTOCAD CLEARLY INDICATING ANY DEVIATIONS FROM THE DESIGN AS SHOWN ON THE DRAWINGS.
- PROVIDE TO THE OWNER FOUR (4) COPIES OF THE OPERATING AND MAINTENANCE MANUALS WITH CATALOG INFORMATION ON ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO: TRANSFORMERS, SWITCHBOARDS, PANELBOARDS, GENERATORS, UPS SYSTEMS, TRANSFER SWITCHES, LIGHTING CONTROL SYSTEMS, COMMUNICATION SYSTEMS, SECURITY SYSTEMS AND FIRE ALARM SYSTEMS.
- SHOP DRAWINGS AND OTHER INFORMATION REQUIRED: PRIOR TO PURCHASING ANY EQUIPMENT OR MATERIALS, A MANUFACTURER'S LIST SHALL BE SUBMITTED FOR REVIEW. PRIOR TO ASSEMBLING OR INSTALLING THE WORK, THE FOLLOWING SHALL BE SUBMITTED FOR REVIEW:
  - CATALOG INFORMATION SHEETS, FACTORY ASSEMBLY DRAWINGS AND FIELD INSTALLATION DRAWINGS AS REQUIRED FOR A COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OR EQUIPMENT SPECIFIED IN THE FOLLOWING SECTIONS.
  - THE PURPOSE FOR THE REVIEW OF SHOP DRAWINGS IS TO MAINTAIN THE INTEGRITY OF THE DESIGN. THE CONTRACTOR CLEARLY INDICATED IN WRITING AND ON THEIR COMPANY LETTERHEAD; ANY CHANGES, SUBSTITUTIONS, DELETIONS OR OTHER DIFFERENCES BETWEEN SUBMISSION AND CONTRACT DOCUMENTS, APPROVAL BY THE ENGINEER DOES NOT CONSTITUTE ACCEPTANCE.
  - NO SUBSTITUTIONS FOR ANY EQUIPMENT MATERIAL AND/OR MANUFACTURER SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL INCLUDING AN EXPLANATION FOR SUBSTITUTION, A LIST OF ANY DEVIATIONS FROM SPECIFIED MODEL, SHOP DRAWINGS AND ASSOCIATED CREDIT. IT SHALL NOT BE ASSUMED THAT THE ENGINEER HAS READ TEXT OR REVIEWED ANY TECHNICAL DATA OF A MANUFACTURED ITEM AND ITS COMPONENTS. EXCEPT WHERE THE VENDOR HAS SPECIFICALLY MENTIONED ALL DIFFERENCES BETWEEN THE SUBSTITUTED PRODUCT AND THE SPECIFIED MODEL.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EQUIPMENT, WIRING, DEVICES, ETC. REQUIRED FOR THE PROPER INSTALLATION OF THE SUBSTITUTED PRODUCT. THIS INCLUDES MODIFICATIONS OF ANY KIND THAT ARE REQUIRED TO ALL ASSOCIATED SYSTEMS AFFECTED BY THE SUBSTITUTION. SUCH ITEMS SHALL BE PROVIDED AT THE FULL EXPENSE OF THE CONTRACTOR WITH NO COSTS INCURRED TO THE OWNER.
  - SUBSTITUTED PRODUCTS SHALL CONFORM TO PERFORMANCE AND SPATIAL REQUIREMENTS IN THESE SPECIFICATIONS AND DRAWINGS. ALL MODIFICATIONS OR REPLACEMENTS OF ANY PRODUCTS THAT DO NOT MEET THESE REQUIREMENTS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL PROVIDE TESTS FOR EACH OF THE FOLLOWING:
  - PRIOR TO ENERGIZING THE ELECTRICAL SYSTEM, THE CONTRACTOR SHALL PROVIDE 600-VOLT INSULATION RESISTANCE TESTS FOR ALL DISTRIBUTION AND UTILIZATION EQUIPMENT. THE CONTRACTOR SHALL PROVIDE A SUITABLE AND STABLE SOURCE OF TEST POWER. THE INSULATION TEST SHALL BE A "MEGGER" TEST AT 500 VOLTS DC FOR 30 SECONDS. THE TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER. A TEST REPORT SHALL BE SUBMITTED TO THE OWNER. THE MINIMUM INSULATION RESISTANCE SHALL BE 10,000 OHMS FOR #12AWG CONDUCTORS AND 250,000 OHMS FOR LARGER CONDUCTORS. CONDUCTORS TESTING BELOW THE MINIMUM INSULATION RESISTANCE SHALL BE REPLACED AND TESTED AGAIN.
  - THE CONTRACTOR SHALL PERFORM A CONTINUITY TEST ON THE ENTIRE ELECTRICAL SYSTEM PRIOR TO ENERGIZING THE SYSTEM TO INSURE PROPER CABLE CONNECTIONS.
  - THE CONTRACTOR SHALL PERFORM CONNECTION TORQUE TESTS FOR ALL LARGER CONDUCTOR BOLTED CONNECTIONS USING A TORQUE WRENCH. TORQUE SHALL BE TO NATIONAL ELECTRICAL TESTING ASSOCIATION'S (NETA) STANDARDS.
  - THE CONTRACTOR SHALL PERFORM MECHANICAL OPERATION TESTS FOR ALL ELECTRICAL EQUIPMENT, SUCH AS DISCONNECT SWITCHES, CIRCUIT BREAKERS, ETC.; TO VERIFY THAT THE MECHANICAL PORTIONS OF THE DEVICE ARE FUNCTIONING.
  - AT THE COMPLETION OF THE LIFE-SAFETY SYSTEM INSTALLATION, THE CONTRACTOR SHALL TEST ALL FIRE ALARM AND EMERGENCY LIGHTING DEVICES. THE CONTRACTOR SHALL SUBMIT A REPORT TO THE ENGINEER VERIFYING THAT THE SYSTEMS ARE FULLY OPERATIONAL.

### B. ELECTRICAL DEMOLITION ~ 260501:

- PRIOR TO SUBMISSION OF BID, THE CONTRACTOR SHALL THOROUGHLY INSPECT THE WORK AREA. BASED ON THIS INSPECTION, THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT TO ACCOMPLISH DEMOLITION WORK.
  - THE ELECTRICAL CONTRACTOR SHALL INCLUDE A CONTINGENCY TO RELOCATE AND/OR RE-SUPPORT AS REQUIRED ANY EXISTING EQUIPMENT, DEVICES, WIRING, ETC. THAT WILL BE AFFECTED BY THE SCOPE OF WORK WHETHER SUCH ITEMS ARE SPECIFICALLY SHOWN ON THE DRAWINGS OR NOT. NO ADDITIONAL COSTS SHALL BE INCURRED TO THE OWNER DURING CONSTRUCTION FOR RELOCATION OF THESE ITEMS.
- AS PART OF DEMOLITION WORK, THE CONTRACTOR IS RESPONSIBLE FOR KEEPING EXISTING SYSTEMS (NOT SCHEDULED FOR REMOVAL) ENERGIZED. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORTS, WIRING DEVICES, WIRE AND CONDUIT AS REQUIRED TO KEEP EXISTING EQUIPMENT AND/OR DEVICES ACTIVE, WHETHER THEY SHARE THE SAME CIRCUITS

- AS DEMOLITION ITEMS OR NOT. THIS INCLUDES EQUIPMENT FEEDERS, RECEPTACLE AND LIGHTING CIRCUITS, COMMUNICATION SYSTEMS, FIRE ALARM SYSTEMS AND CIRCUITS, ETC.
- EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH THE EXISTING ELECTRICAL SYSTEMS.
  - VERIFY THAT ALL ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.
  - REMOVE ALL ABANDONED WIRING AND EXPOSED CONDUIT, INCLUDING THOSE ABANDONED ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH WITH WALLS AND FLOORS; AND PATCH SURFACES.
  - ALL EXISTING BRANCH CIRCUITS NOT TO BE REUSED SHALL BE REMOVED BACK TO SERVING PANELBOARD. CIRCUIT BREAKERS SHALL BE LABELED AS SPARE AND PLACED IN THE "OFF" POSITION. EXISTING CONDUIT SHALL REMAIN FROM PANELBOARD TO ABOVE ACCESSIBLE CEILING SPACE.
  - SINCE PROPOSED RENOVATIONS OF THE PROJECT DO NOT ENCOMPASS THE ENTIRE FLOOR, IT IS ANTICIPATED THAT MANY OF THE EXISTING CIRCUITS AND BRANCH CIRCUIT BREAKERS IN THE EXISTING PANELBOARDS MAY BE NEEDED TO SERVE EXISTING LOADS NOT AFFECTED BY THE MODIFICATIONS. HOWEVER, IT IS THE INTENTION OF THE ELECTRICAL DESIGN TO USE EXISTING SPARE CIRCUITS AND THOSE CIRCUITS MADE SPARE BY THE DEMOLITION WORK TO MAXIMUM EXTENT POSSIBLE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING EXACT CIRCUIT NUMBER AND PANELBOARD DESIGNATION.
  - ASBESTOS PROCEDURE: THE CONTRACTOR SHALL, UPON CONTACTING MATERIAL SUSPECTED OF BEING ASBESTOS, NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY AND WORK AROUND SUSPECTED AREA.

### C. WIRES AND CABLES ~ 260519:

- ALL CONDUCTORS SHALL BE SOFT 98% MINIMUM CONDUCTIVITY REFINED COPPER, INSULATION TYPE "THHN/THWN" RATED 600 VOLTS UNLESS INDICATED OTHERWISE.
  - ALL CONDUCTORS INSTALLED UNDERGROUND SHALL BE INSULATION TYPE "XHHW-2" UNLESS INDICATED OTHERWISE REGARDLESS IF THE CONDUCTORS ARE INSTALLED IN CONDUIT.
- MINERAL INSULATED (TYPE MI) CABLE SHALL BE 2-HOUR FIRE-RATED SOLID HIGH-CONDUCTIVITY COPPER RATED 600 VOLTS WITH 90° TEMPERATURE RATING. CONDUCTORS SHALL HAVE MAGNESIUM OXIDE INSULATION MATERIAL AND SEAMLESS SOFT-DRAWN COPPER SHEATH MATERIAL.
  - MI CABLE SHALL COMPLY WITH UL 2196, "TESTS FOR FIRE RESISTIVE CABLES".
- ALL CONDUCTOR CABLE FOR VARIABLE FREQUENCY DRIVE (VFD) FEEDERS SHALL BE FLEXIBLE TYPE (TO FINELY STRANDED TINNED COPPER) INSULATION TYPE XLPE RATED 600 VOLTS WITH SPIRALED COPPER THREE SYMMETRICAL TINNED COPPER 100%-RATED GROUNDS; AND BLACK SUNLIGHT- AND OIL-RESISTANT TYPE JACKET MATERIAL.
  - VFD CONDUCTOR CABLE SHALL BE INSTALLED BETWEEN VARIABLE FREQUENCY DRIVE AND ASSOCIATED MOTOR.
- METAL CLAD CABLE MAY BE USED FOR INDOOR LIGHTING AND RECEPTACLE BRANCH CIRCUITS WHEN WRITTEN APPROVAL IS GIVEN BY THE OWNER AND SHALL BE INSTALLED ONLY WHERE PERMITTED BY CODE. METAL CLAD CABLE SHALL BE LIGHTWEIGHT GALVANIZED STEEL INTERLOCKED ARMOR WITH CONDUCTORS AS SPECIFIED ABOVE. CABLE SHALL BE PROVIDED WITH SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ARMOR SHALL NOT BE USED AS MEANS OF GROUNDING.
- INCLUDE IN OVERALL JACKET, TWO (2) #16AWG LOW-VOLTAGE CONDUCTORS (PURPLE/GRAY) SEPARATELY INSULATED FROM POWER CONDUCTORS FOR 0-10V DIMMING APPLICATIONS.
- ALL WIRES #10AWG AND SMALLER SHALL BE SOLID COPPER. ALL WIRES #8AWG AND LARGER SHALL BE STRANDED COPPER.
- FACTORY COLOR CODE USING THE SAME CODE THROUGHOUT FOR CONDUCTORS AS FOLLOWS:  
120/208 VOLTS ~ BLACK, RED, BLUE AND WHITE NEUTRAL CONDUCTOR  
277/480 VOLTS ~ BROWN, ORANGE, YELLOW AND GRAY NEUTRAL CONDUCTOR  
GREEN CONDUCTOR SHALL BE USED WHERE EQUIPMENT GROUND WIRE IS SPECIFIED.  
GREEN WITH YELLOW STRIPE CONDUCTOR SHALL BE USED WHERE ISOLATED GROUND WIRE IS SPECIFIED.
- MINIMUM CONDUCTOR SIZES SHALL BE #12AWG FOR POWER AND LIGHTING CIRCUITS, #10AWG FOR BRANCH CIRCUIT RUNS LONGER THAN 100 FEET AND #14AWG FOR CONTROL CIRCUITS UNLESS INDICATED OTHERWISE.
- NO CONDUCTORS SHALL BE PULLED INTO ANY CONDUIT RUN BEFORE ALL CONDUIT JOINTS ARE TIGHT AND ENTIRE RUN IS SECURED IN PLACE. WHERE NECESSARY FOR WIRING INSTALLATION, PULLING COMPOUND SHALL BE POWERED SOAPSTONE, MINERALS #100 OR APPROVED EQUAL.
- TERMINATIONS OF #8AWG OR LARGER AT SWITCHBOARDS, TRANSFORMERS AND UPS SYSTEMS SHALL BE MADE WITH COMPRESSION TYPE CONNECTORS. TERMINATIONS OF #6AWG OR LARGER AT PANELBOARDS SHALL BE MADE WITH MECHANICAL LUGS.
- JOINS AND TAPS OF #6AWG OR LARGER SHALL BE MADE WITH PRESSURE-INDENT TYPE CONNECTORS.
- TAG ALL FEEDERS ROUTED THROUGH ELECTRICAL BOXES, GUTTER SPACES AND WREWAYS.
- ACCEPTABLE MANUFACTURERS ARE ALLIED, GENERAL CABLE, PHELPS DODGE, ROME, SIMPLEX AND SOUTHWIRE FOR WIRES AND CABLES.
- ACCEPTABLE MANUFACTURERS ARE NVENT PYROTEXAN OR APPROVED EQUAL FOR TYPE MI CABLE.
- ACCEPTABLE MANUFACTURERS ARE ALLIED, BELDEN AND SOUTHWIRE FOR VFD CABLE.
- ACCEPTABLE MANUFACTURERS ARE AFC, ALLIED AND SOUTHWIRE FOR METAL CLAD CABLE.

### D. GROUNDING AND GROUND-FAULT PROTECTION ~ 260526:

- GROUNDING SHALL COMPLY WITH NEC ARTICLE 250.
- EACH CIRCUIT SHALL HAVE AN EQUIPMENT GROUND CONDUCTOR. MULTI-WIRE CIRCUITS OF DIFFERENT PHASES MAY SHARE EQUIPMENT GROUND CONDUCTOR. THE EQUIPMENT GROUND CONDUCTOR SHALL NOT BE LESS THAN #12AWG OR AS SHOWN ON DRAWINGS. PROVIDE ELECTRICAL CONTINUOUS, TIGHT GROUNDING CONNECTIONS TO ALL SERVING DEVICES UNLESS NOTED OTHERWISE. WIRING DEVICE GROUNDING CONNECTIONS SHALL BE MADE VIA PIGTAIL FROM GROUND SCREW WITHIN DEVICE BACK BOX. INSTALL IN STRICT ACCORDANCE WITH NEC ARTICLE 300.13 (B).
- EQUIPMENT GROUND CONDUCTORS SHALL BE INSTALLED IN CONDUIT OR SUITABLY PROTECTED FROM DAMAGE.
- CONDUITS ARE NOT TO BE USED AS MEANS OF GROUNDING.
- ACCEPTABLE MANUFACTURERS ARE BURNDY, ERICO AND SQUARE D.

### E. SUPPORTING DEVICES ~ 260529:

- SUPPORT OF NEW ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE BEST INDUSTRY PRACTICES. DO NOT FASTEN SUPPORTS TO MECHANICAL EQUIPMENT, DUCTWORK, PIPING OR CONDUIT.
- FURNISH AND INSTALL STEEL SUPPORT FRAMES, MEMBERS, HANGERS, BRACKETS, ETC. AS REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL EQUIPMENT.
- SUPPORT FRAMES FOR NEW LIGHT FIXTURES INDEPENDENT OF OTHER SUPPORTS WHEREVER POSSIBLE.
- SUPPORT FRAMES BOLTED TO FLOOR SLAB AND EXTENDING TO SLAB ABOVE SHALL BE PROVIDED AS REQUIRED FOR FREE STANDING EQUIPMENT OR WHERE WALLS ARE UNABLE TO SUPPORT EQUIPMENT WEIGHT.
- ALL CONDUITS UP TO 1 1/2" TRADE SIZE SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS SECURED TO BLACK IRON CEILING SUPPORT SYSTEM. STRUCTURAL MEMBERS OR SLAB ABOVE AT INTERVALS NO GREATER THAN 7'-0" AND WITHIN 12" OF CONDUIT END. ALL CONDUITS 2" TRADE SIZE OR LARGER SHALL BE SUPPORTED BY APPROVED HANGERS AND INSERTS FROM SLAB ABOVE AT INTERVALS NO GREATER THAN 10'-0" AND WITHIN 18" OF CONDUIT END. SUPPORT FROM CEILING TEES, CROSS TEES OR WIRES IS PROHIBITED.
- ACCEPTABLE MANUFACTURERS ARE COOPER B-LINE, KINDORF AND UNISTRUT.

### F. RACEWAYS FOR ELECTRICAL SYSTEMS ~ 260533:

- MATERIALS:
  - EMT: THIN WALL, HOT-DIPPED GALVANIZED STEEL (3/4" MINIMUM) ~ CONDUIT TO BE USED FOR ALL WORK CONCEALED IN WALLS AND ABOVE FINISHED CEILINGS; AND FOR EXPOSED RUNS UP TO 1 1/2" TRADE SIZE. USE WITH STEEL COMPRESSION FITTINGS ONLY.
  - IMC: HOT-DIPPED GALVANIZED STEEL ~ CONDUIT MAY BE USED FOR RISERS, PANELBOARD FEEDERS, THREE-PHASE MOTOR FEEDERS; AND FOR CONCEALED RUNS 2" TRADE SIZE AND LARGER. USE WITH THREADED FITTINGS ONLY.
  - RMC: HOT-DIPPED RIGID GALVANIZED STEEL ~ UNLESS OTHERWISE NOTED; CONDUIT TO BE USED FOR ALL RISERS, PANELBOARD FEEDERS, THREE-PHASE MOTOR FEEDERS, CONDUIT INSTALLED IN SLAB; AND FOR EXPOSED RUNS 2" TRADE SIZE AND LARGER. CONDUIT SHALL BE GALVANIZED FOR CORROSION PROTECTION FOR CONDUIT INSTALLED IN CONCRETE SLAB. USE WITH THREADED FITTINGS ONLY.
  - FMC: INTERLOCKING COIL FORMED GALVANIZED STEEL STRIP (72" MAXIMUM LENGTH) ~ CONDUIT TO BE USED FOR ALL LIGHT FIXTURE WHIPS AND FINAL CONNECTIONS TO TRANSFORMERS AND MOTORS. USE WITH INSULATED-THROAT, COMPRESSION CONNECTORS.
  - LFMC: HELICALLY WOUND GALVANIZED STEEL STRIP WITH MOISTURE SEALING JACKET (72" MAXIMUM LENGTH) ~ CONDUIT TO BE USED FOR ALL LOCATIONS WITHIN 6'-0" OF A WATER SOURCE OR WHERE EXPOSED TO DAMP ATMOSPHERES OR CORROSIVE MATERIALS. USE WITH LIQUID-TIGHT, INSULATED-THROAT, COMPRESSION CONNECTORS.
  - RNC: RIGID SCHEDULE 80 PVC ~ CONDUIT TO BE USED FOR ALL WORK BELOW GRADE. PROVIDE WITH RIGID GALVANIZED STEEL ELBOWS.

- SURFACE NONMETALLIC RACEWAYS: TWO-PIECE, DUAL-COMPARTMENT RIGID PVC WITH TEXTURE AND COLOR AS SELECTED BY THE ARCHITECT FROM THE MANUFACTURER'S STANDARD COLORS. PROVIDE NEMA 5-20R DUPLEX RECEPTACLES AND COMBINATION VOICE/DATA OUTLETS SPACING 12" ON CENTERS.
- KEEP CONDUITS AND OTHER OPENINGS CLOSED TO PREVENT ENTRY OF FOREIGN MATTER DURING CONSTRUCTION AND PRIOR TO WIRE OR CABLE INSTALLATION.
- ALL CONDUIT IN FINISHED AREAS SHALL BE CONCEALED IN WALLS OR ABOVE FINISHED CEILING WHERE POSSIBLE. IN FINISHED AREAS WHERE ANY CONDUIT CANNOT BE CONCEALED DUE TO FIELD CONDITIONS, THE GENERAL CONTRACTOR SHALL PAINT CONDUIT AS DIRECTED BY THE ARCHITECT.
- ALL CONDUIT SHALL BE SECURELY FASTENED IN PLACE TO STRUCTURAL MEMBERS. DO NOT FASTEN TO PIPING, MECHANICAL EQUIPMENT, ELECTRICAL PANELS, HANGERS AND/OR SUPPORTS AT EACH ELBOW AND WITHIN 12" OF EACH CONDUIT TERMINATION INTO A BOX, ENCLOSURE OR CABINET. PROVIDE APPROVED BEAM CLAMPS, PIPE STRAPS OR HEAVY IRON TIES WHERE CONDUITS PENETRATE FLOOR/CEILING SLABS.
- ALL CONDUIT TERMINATING IN METAL ENCLOSURES SHALL BE PROVIDED WITH AN INSULATED BUSHING. PROVIDE "GROUNDING" TYPE BUSHING WHERE REQUIRED.
- EXPANSION FITTINGS SHALL BE PROVIDED AT ALL EXPANSION JOINTS.
- CONDUIT TO BE INSTALLED TO AVOID PROXIMITY WITH STEAM AND HOT WATER PIPING. MAINTAIN 12" BETWEEN CONDUIT AND PIPING WHEREVER POSSIBLE. AT NO POINT SHALL SPACING BE LESS THAN 4" BETWEEN CONDUIT AND PIPING INSULATION.
- ACCEPTABLE MANUFACTURERS ARE ALLIED TUBE & CONDUIT, NATIONAL WIRE PRODUCTS, REPUBLIC AND TRIANGLE FOR CONDUITS AND ASSOCIATED FITTINGS.
- ACCEPTABLE MANUFACTURERS ARE HUBBELL, THOMAS & BETTS AND WIREMOLD FOR SURFACE RACEWAYS.
- BOXES FOR ELECTRICAL SYSTEMS ~ 260534:

- OUTLET, JUNCTION AND PULL BOXES SHALL BE INDUSTRY STANDARD GAUGE, GALVANIZED SHEET STEEL. BOXES SHALL BE INSTALLED WHERE NECESSARY TO FULFILL DESIGN INTENT REGARDLESS OF INDICATIONS AS SHOWN ON DRAWINGS. ALL BOXES SHALL BE MADE ACCESSIBLE. PROVIDE ACCESS PANELS WHERE NECESSARY AND COORDINATE LOCATIONS WITH THE ARCHITECT.
- FLOOR AND POKE-THRU BOXES SHALL BE SIZED AS REQUIRED FOR INSTALLATION OF ALL WIRING DEVICES OR MODULAR FURNITURE CONNECTIONS AS SHOWN ON DRAWINGS. PROVIDE BOXES WITH METALLIC FLANGE AND DEVICE COVER OF COLOR AND FINISHES AS DIRECTED BY THE ARCHITECT. BOXES SHALL BE FIRE-RATED AS REQUIRED TO MAINTAIN THE FIRE RATING OF FLOOR SLAB WHERE APPLICABLE.
  - FLOOR BOXES SHALL BE GALVANIZED STEEL, WHERE INSTALLED IN RAISED FLOORS. FLOOR BOXES SHALL BE SHALLOW DEPTH, FIRE-RATED CAST IRON WHERE INSTALLED IN CONCRETE FLOOR SLABS.
  - POKE-THRU BOXES SHALL BE FIRE-RATED GALVANIZED STEEL WITH AN INTUMESCENT FIRE-STOP MATERIAL AND STAMPED STEEL JUNCTION BOXES FOR POWER AND VOICE/DATA CONNECTIONS.
  - POWER CIRCUITS AND COMMUNICATIONS CABLING SHALL BE INSTALLED IN HARD CONDUIT FROM ALL BOXES TO ABOVE THE SERVING TENANT'S ACCESSIBLE CEILING SPACE. CONDUIT SHALL BE ROUTED TO NEAREST AVAILABLE WALL CAVITY AND LABELED WITH THE SERVING TENANT'S NAME AT 10'-0" ON CENTERS.
  - FIELD VERIFY EXACT LOCATIONS OF ALL FLOOR AND/OR POKE-THRU BOXES WITH THE ARCHITECT AND/OR BUILDING MANAGEMENT PRIOR TO ROUGH-IN. REFER TO ITEM 8 UNDER GENERAL 260100 SECTION FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
- BARRIERS SHALL BE INDUSTRY STANDARD GAUGE, CONDUCTIVE MATERIAL WITH ANGLE IRON FRAMING SUPPORT AROUND ITS PERIMETER AND SHALL HAVE ADEQUATE THICKNESS (1/8" MINIMUM) AS REQUIRED FOR MECHANICAL STRENGTH NECESSARY TO FULLY PROTECT THE SYSTEM. BARRIERS SHALL BE PROVIDED BETWEEN SEPARATE SYSTEMS AND BETWEEN SEPARATE VOLTAGES.
- NORMAL POWER AND EMERGENCY POWER SYSTEMS SHALL NOT BE INSTALLED IN COMMON ELECTRICAL BOXES AND SHALL BE KEPT SEPARATE.
- PROVIDE ADEQUATE OUTLET BOXES FOR MOUNTING ALL DEVICES. DO NOT USE ROUND JUNCTION BOXES.
  - FURNISH AND INSTALL 4 11/16" SQUARE BY 1 1/2" OR 2 1/8" DEEP BACK BOX WITH EXTENSION RING FOR SWITCH AND RECEPTACLE OUTLETS. ALL OUTLET AND PULL BOXES SHALL BE APPROPRIATELY SIZED TO ACCOMMODATE INSTALLED WIRING DEVICES.
  - FURNISH AND INSTALL 4" OCTAGONAL BY 2 1/8" DEEP BACK BOX WITH 3/8" FIXTURE STUD FOR CEILING AND/OR SUSPENDED LIGHTING OUTLETS.
  - FURNISH AND INSTALL WALL BOX, FLOOR BOX OR POKE-THRU DEVICE FOR POWER CONNECTION OF MODULAR FURNITURE FEEDS. REFER TO ARCHITECTURAL DRAWINGS FOR BOX REQUIREMENTS. PROVIDE WITH 3/4" FLEXIBLE CONDUIT WHIP TO FURNITURE SYSTEM POWER CABLING.
    - COORDINATE EXACT BOX QUANTITIES AND LOCATIONS WITH THE MODULAR FURNITURE INSTALLER.
- JUNCTION AND PULL BOXES SHALL HAVE REMOVABLE SCREW-ON COVER PLATES AND BE PROVIDED EVERY 100 FEET OF CONDUIT RUN AND WHERE NECESSARY TO FACILITATE THE INSTALLATION OF EQUIPMENT AND WIRING.
  - BOXES SERVING FIRE ALARM SYSTEM SHALL BE PAINTED RED IN COLOR AND LABELED "FIRE".
  - BOXES SERVING EMERGENCY SYSTEM SHALL BE PAINTED YELLOW IN COLOR.
  - BOXES SHALL BE SIZED TO COMPLY WITH THE MINIMUM BENDING RADIUS CRITERIA AS SPECIFIED BY THE NEC.
  - BOXES HAVING ANY SINGLE DIMENSION LARGER THAN 36" SHALL BE PROVIDED WITH CABLE SUPPORT RACKS. CABLE SUPPORT RACKS SHALL CONSIST OF 3/4" DIAMETER STEEL PIPING WITH FLANGED ENDS BOLTED TO FRAME OF BOX AND FITTED WITH CONTINUOUS FIBER INSULATING SLEEVES ARRANGED IN TERS. INSTALL RACKS WITHIN 36" OF BOX.
- ACCEPTABLE MANUFACTURERS ARE APPLETON, CROUSE HINDS, O.Z./GEDNEY, RACO AND THOMAS & BETTS FOR OUTLET, JUNCTION AND PULL BOXES.
- ACCEPTABLE MANUFACTURERS ARE FSR, HUBBELL, THOMAS & BETTS AND WIREMOLD FOR FLOOR AND POKE-THRU BOXES.
- ACCEPTABLE MANUFACTURERS ARE BURNDY, CROUSE HINDS, NEPCO, O.Z./GEDNEY, RACO AND THOMAS & BETTS FOR BUSHINGS, CONNECTORS, COUPLINGS AND FITTINGS.

### H. VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS ~ 260548:

- PROVIDE SEISMIC RESTRAINTS, INCLUDING ALL STRUCTURAL STEEL MEMBERS, INSERTS, ANCHORS, WIRES, ETC. AS REQUIRED FOR ALL ELECTRICAL EQUIPMENT. ALL SEISMIC RESTRAINTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ALL LOCAL CODES, ORDINANCES AND THE LOCAL AUTHORITY HAVING JURISDICTION.

### I. ELECTRICAL IDENTIFICATION ~ 260553:

- PROVIDE THERMOPLASTIC ENGRAVED NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, CIRCUIT BREAKERS, DISCONNECT SWITCHES, PANELBOARDS, SWITCHBOARDS, TRANSFORMERS, ETC. AS REQUIRED BY THE NATIONAL ELECTRIC CODE. NAMEPLATES SHALL INDICATE EQUIPMENT NAME, VOLTAGE AND AMPERAGE.
  - ALL FUSED DISCONNECT SWITCHES SHALL BE PROVIDED WITH THE INSTALLED FUSE SIZE LISTED ON THE NAMEPLATE.
- NAMEPLATES FOR EQUIPMENT ON NORMAL POWER SHALL BE BLACK WITH WHITE LETTERING. NAMEPLATES FOR EQUIPMENT ON EMERGENCY POWER SHALL BE YELLOW WITH BLACK LETTERING.
- PROVIDE "DANGER" LABELING FOR ALL ELECTRICAL EQUIPMENT, BOXES, ETC. AS REQUIRED BY NEC CODES. LABELING SHALL INCLUDE ALL REQUIREMENTS FOR ARC-FLASH AND FAULT-CURRENT IDENTIFICATION IN ACCORDANCE WITH NEC CODES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MARKING ALL FIXED EQUIPMENT, RECEPTACLES AND SWITCHES WITH THE PANELBOARD NAME AND CIRCUIT BREAKER NUMBER SERVING EACH DEVICE WITH TYPEWRITTEN LABELS.

### J. OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDIES ~ 260573:

- SHORT-CIRCUIT FAULT CURRENTS:
  - CALCULATE THE MAXIMUM AVAILABLE SHORT-CIRCUIT CURRENT IN RMS SYMMETRICAL AMPERES FOR THE ELECTRICAL POWER DISTRIBUTION SYSTEM FROM "NORMAL UTILITY" AND "EMERGENCY/GENERATOR" SOURCES. INCLUDE STUDIES OF SYSTEM SWITCHING CONFIGURATIONS AND ALTERNATE OPERATING MODES THAT COULD EXIST UNDER MAXIMUM FAULT CONDITIONS. CALCULATE MOMENTARY AND INTERRUPTING DUTIES ON THE BASIS OF MAXIMUM AVAILABLE FAULT CURRENT.
  - FAULT CURRENTS SHALL BE DETERMINED AT ALL SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS AND CIRCUIT BREAKER POSITIONS OF THE ELECTRICAL POWER DISTRIBUTION SYSTEM. THE CALCULATION SHALL BE FOR THE CURRENT IMMEDIATELY AFTER INITIATION AND FOR A THREE-PHASE BOLTED SHORT-CIRCUIT. PERFORM A SELECTIVE DEVICE COORDINATION STUDY USING THE FAULT CURRENT LEVELS ESTABLISHED BY THE SHORT-CIRCUIT CALCULATIONS.
  - PREPARE A WRITTEN REPORT FOR SUBMITTAL TO THE ENGINEER. THE STUDY SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING:
    - PROVIDE DEVICE SETTINGS AND RATINGS OF ALL OVERCURRENT PROTECTIVE DEVICES.
      - FOR 600-VOLT OVERCURRENT PROTECTIVE DEVICES, ENSURE THAT INTERRUPTING RATINGS ARE EQUAL TO OR HIGHER THAN CALCULATED 1/2-CYCLE SYMMETRICAL FAULT CURRENT.
      - FOR DEVICES AND EQUIPMENT RATED FOR ASYMMETRICAL FAULT CURRENT, APPLY MULTIPLICATION FACTORS LISTED IN THE STANDARDS FOR 1/2-CYCLE SYMMETRICAL FAULT CURRENT.

- VERIFY ADEQUACY OF PHASE CONDUCTORS AT THE MAXIMUM THREE-PHASE BOLTED FAULT CURRENTS. VERIFY ADEQUACY OF EQUIPMENT GROUNDING CONDUCTOR SIZES AND GROUNDING ELECTRODE CONDUCTORS AT THE MAXIMUM GROUND-FAULT CURRENTS.
- ENSURE THAT SHORT-CIRCUIT WITHSTAND RATINGS ARE EQUAL TO OR HIGHER THAN CALCULATED 1/2-CYCLE SYMMETRICAL FAULT CURRENT.
- DEMONSTRATE SELECTIVE COORDINATION BY COMPUTER-GENERATED, TIME-CURRENT COORDINATION PLOTS.
- SHOW CALCULATED X/R RATIOS AND EQUIPMENT INTERRUPTING RATING FOR 1/2-CYCLE FAULT CURRENTS ON THE ELECTRICAL POWER DISTRIBUTION SYSTEM DIAGRAM.
- PROVIDE TABULAR FORMAT OF SETTINGS SELECTED FOR OVERCURRENT PROTECTIVE DEVICES.
  - PROVIDE COORDINATION CURVES:
    - PREPARE TO DETERMINE SETTINGS OF OVERCURRENT PROTECTIVE DEVICES TO ACHIEVE SELECTIVE COORDINATION.
    - GRAPHICALLY ILLUSTRATE THAT ADEQUATE TIME SEPARATION EXISTS BETWEEN DEVICES INSTALLED IN SERIES, INCLUDING POWER UTILITY COMPANY'S UPSTREAM DEVICES.
    - PREPARE SEPARATE SETS OF CURVES FOR SWITCHING SCHEMES; AND FOR EMERGENCY PERIODS WHERE POWER SOURCE IS LOCAL GENERATION.
- ARC-FLASH FAULT CURRENTS:
  - USE FAULT CURRENT LEVELS AND EQUIPMENT DATA CONTAINED IN THE SHORT-CIRCUIT STUDY; AND PERFORM AN ARC-FLASH STUDY THAT COMPLIES WITH THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS:
    - OSHA CFR 39 PART 1910 SUBPARTS
    - NATIONAL ELECTRIC CODE (NFPA 70) SECTION 110.116
    - STANDARD FOR ELECTRICAL SAFETY IN THE WORK PLACE (NFPA 70E)
    - IEEE GUIDE FOR PERFORMING ARC-FLASH ANALYSIS CALCULATIONS (IEEE STD. 1584)
    - NATIONAL ELECTRIC SAFETY CODE (IEEE STD C2)
  - FAULT CURRENTS SHALL BE DETERMINED AT ALL TRANSFORMERS, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, FUSES, ENCLOSED SWITCHES, CIRCUIT BREAKERS AND TRANSFER SWITCHES OF THE ELECTRICAL POWER DISTRIBUTION SYSTEM.
  - PREPARE A WRITTEN REPORT FOR SUBMITTAL TO THE ENGINEER. THE STUDY SHALL INCLUDE, BUT IS NOT LIMITED TO, THE FOLLOWING:
    - DETERMINE THE PROTECTIVE DEVICE CHARACTERISTICS AND DURATION OF THE ARC.
    - DOCUMENT ALL SYSTEM VOLTAGES AND CLASSES OF EQUIPMENT.
    - SELECT THE APPROPRIATE WORKING DISTANCE FOR EQUIPMENT.
    - DETERMINE THE INCIDENT ENERGY FOR ALL EQUIPMENT IN THE STUDY.
    - DETERMINE THE FLASH-PROTECTION BOUNDARY FOR ALL EQUIPMENT IN THE STUDY.

### K. LIGHTING CONTROL DEVICES ~ 260923: (NOT APPLICABLE)

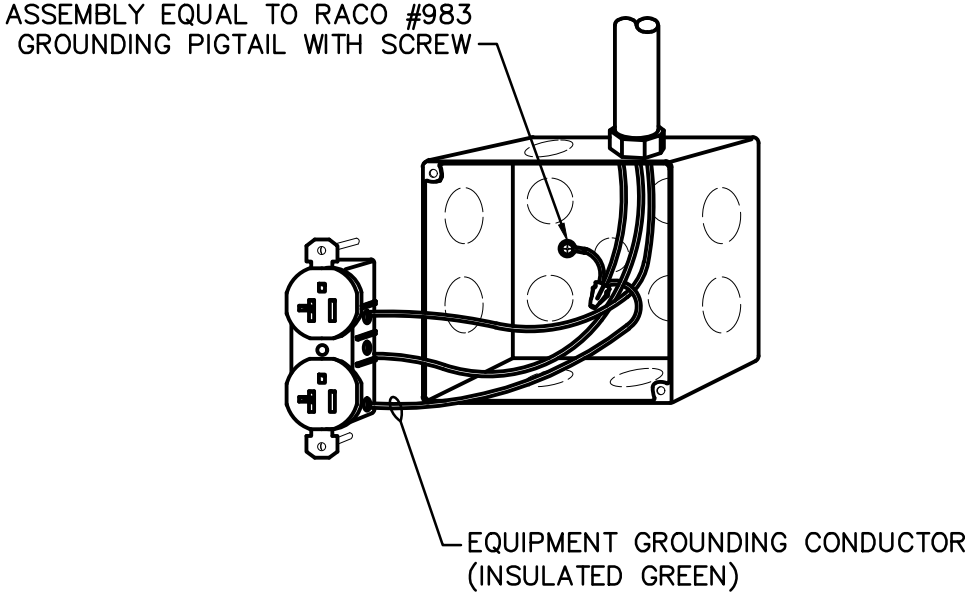
12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
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PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UN RIDGEFIELD, CT 06877			
DRAWING TITLE: ELECTRICAL LEGENDS, NOTES AND SPECIFICATIONS			
SCALE:	NONE	DRAWN BY:	MM
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	NU

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ELECTRICAL SPECIFICATIONS (CONTINUED)

- L. MODULAR DIMMING CONTROL – 260936: (NOT APPLICABLE)
- M. TRANSFORMERS – 262200: (NOT APPLICABLE)
- N. SWITCHBOARDS – 262413: (NOT APPLICABLE)
- O. PANELBOARDS – 262416:
3. EXISTING PANELBOARDS/LOADCENTERS: CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ALL ELECTRICAL CONNECTIONS. REPLACE ALL DAMAGED CIRCUIT BREAKERS AND PROVIDE NEW CIRCUIT BREAKERS WHERE NECESSARY. NEW CIRCUIT BREAKERS SHALL MATCH EXISTING PANELBOARD/LOADCENTER IN MANUFACTURER AND AIC RATING. PROVIDE CLOSURE PLATES FOR VACANT POSITIONS. PROVIDE NEW UPDATED TYPEDWRITTEN DIRECTORY SHOWING REVISED CIRCUITING ARRANGEMENT. THE CONTRACTOR SHALL VERIFY ALL CONDUIT AND FEEDER SIZES ASSOCIATED WITH PANELBOARDS/LOADCENTERS. ALL CODE DISCREPANCIES SHALL BE BROUGHT TO ATTENTION OF THE ARCHITECT AND THE ENGINEER.
- P. ELECTRICITY METERING – 262713: (NOT APPLICABLE)
- Q. WIRING DEVICES – 262726:
1. WIRING DEVICES SHALL BE SPECIFICATION GRADE AND AS FOLLOWS:
- 1.1. RECEPTACLES: PROVIDE UL498 LISTED COMMERCIAL GRADE, 20A/125V NEMA 5-20R, DECORATIVE ARCHITECTURAL STYLE RECEPTACLES UNLESS INDICATED OTHERWISE.
- 1.2. GROUND-FAULT CIRCUIT INTERRUPTING TYPE RECEPTACLES: PROVIDE UL498 LISTED COMMERCIAL GRADE, 20A/125V NEMA 5-20R, DECORATIVE ARCHITECTURAL STYLE GFCI TYPE RECEPTACLE WITH SELF-TEST CIRCUITRY.
- 1.3. USB TYPE RECEPTACLES: PROVIDE UL498 AND UL1310 LISTED COMMERCIAL GRADE, 20A/125V NEMA 5-20R, DECORATIVE ARCHITECTURAL STYLE RECEPTACLES WITH TWO (2) USB CHARGING PORTS.
- 1.4. TAMPER-RESISTANT TYPE RECEPTACLES: PROVIDE UL498 LISTED COMMERCIAL GRADE, 20A/125V NEMA 5-20R, DECORATIVE ARCHITECTURAL STYLE RECEPTACLES WITH SPRING-LOADED SHUTTERS THAT CLOSE OFF THE CONTACT OPENINGS, OR SLOTS. RECEPTACLES SHALL HAVE "TR" SYMBOL ON STRAP OR BODY OF DEVICE.
- 1.5. ISOLATED GROUND TYPE RECEPTACLES: PROVIDE UL498 LISTED HOSPITAL GRADE, 20A/125V NEMA 5-20R IG RECEPTACLE, ORANGE IN COLOR WITH TRIANGLE INDICATOR.
- 1.6. SURGE-PROTECTION RECEPTACLES: PROVIDE UL498 LISTED HOSPITAL GRADE, 20A/125V NEMA 5-20R GROUND-FAULT CIRCUIT INTERRUPTING TYPE RECEPTACLE WITH BLUE SURGE ARRESTOR.
- 1.7. SINGLE-POLE SWITCHES: PROVIDE U.L. LISTED COMMERCIAL GRADE, 20AMP, 120-277VAC SINGLE-POLE, TOGGLE-OPERATED, QUIET-TYPE, DECORATIVE ROCKER STYLE WALL SWITCH.
- 1.8. THREE-WAY SWITCHES: PROVIDE U.L. LISTED COMMERCIAL GRADE, 20AMP, 120-277VAC THREE-WAY, TOGGLE-OPERATED, QUIET-TYPE, DECORATIVE ROCKER STYLE WALL SWITCH.
- 1.9. FOUR-WAY SWITCHES: PROVIDE U.L. LISTED COMMERCIAL GRADE, 20AMP, 120-277VAC FOUR-WAY, TOGGLE-OPERATED, QUIET-TYPE DECORATIVE ROCKER STYLE WALL SWITCH.
- 1.10. ACTUATOR PUSH BUTTON SWITCH: PROVIDE U.L. LISTED COMMERCIAL GRADE, 20AMP, 120-277VAC SINGLE-POLE, ACTUATOR-TYPE PUSHBUTTON SWITCH SUITABLE FOR MOUNTING IN DOOR JAMB.
- 1.11. DIMMERS: PROVIDE U.L. LISTED COMMERCIAL GRADE, DECORATIVE ARCHITECTURAL STYLE, SLIDE-TO-OFF, 120-277VAC DIMMER SWITCH RATED AS REQUIRED FOR ASSOCIATED LOAD. COORDINATE TYPE OF DIMMER WITH THE LIGHT FIXTURE AND/OR LAMP MANUFACTURER.
- 1.12. TIMER SWITCHES: PROVIDE TITLE 24 COMPLIANT U.L. LISTED COMMERCIAL GRADE, 20AMP, 120VAC SINGLE-POLE TIMER SWITCH WITH FIVE BUTTONS SET FOR 15MIN, 30MIN, 1HR, 2HRS AND OFF.
- 1.13. MOTOR-RATED SWITCHES: PROVIDE U.L. LISTED COMMERCIAL GRADE, 600VAC, TOGGLE-OPERATED, HEAVY-DUTY SWITCH SUITABLE FOR USE AS MOTOR DISCONNECT. PROVIDE AMPERAGE RATING AND TYPE PER THE EQUIPMENT MANUFACTURER'S SPECIFICATIONS.
- 1.14. RAISE/LOWER SWITCHES: PROVIDE U.L. LISTED COMMERCIAL GRADE, 20AMP, 120-277VAC SINGLE-POLE, DOUBLE-THROW, TOGGLE-OPERATED, QUIET-TYPE, DECORATIVE ROCKER STYLE WALL SWITCH WITH CENTER "OFF" FOR MOTORIZED DOORS, SCREENS AND SHADES. COORDINATE EXACT REQUIREMENTS WITH THE EQUIPMENT SUPPLIER.
- 1.15. COMBINATION SMOKE AND CARBON MONOXIDE DETECTORS: PROVIDE U.L. LISTED RESIDENTIAL GRADE, INTER-CONNECTABLE, BATTERY BACK-UP, HARD-WIRED 120VAC DETECTOR WITH PHOTOELECTRIC SMOKE AND ELECTROCHEMICAL CARBON MONOXIDE SENSORS. CARBON MONOXIDE SENSOR SHALL ACTIVATE ALARM UNDER THE FOLLOWING CONCENTRATION LEVELS: 70ppm AT 60-240 MINUTES, 150ppm AT 10-50 MINUTES AND 400ppm AT 4-15 MINUTES. DETECTOR SHALL HAVE THE FOLLOWING FEATURES:
- 1.15.a. DEVICES SHALL BE CAPABLE OF BEING INTERCONNECTED WITH OTHER DEVICES WITHIN THE SAME DWELLING UNIT SUCH THAT IF ONE DEVICE IS ACTIVATED, IT WILL INITIATE ALARM OF ALL OTHER DEVICES WITH UNIT
- 1.15.b. GREEN VISUAL SIGNAL INDICATING DETECTOR IS FUNCTIONING PROPERLY.
- 1.15.c. RED VISUAL SIGNAL INDICATING DETECTOR IS IN ALARM.
- 1.15.d. END-OF-LIFE AUDIBLE SIGNAL
- 1.15.e. LOW BATTERY AUDIBLE SIGNAL
- 1.15.f. AUDIBLE ALARM RATED AT 85db AT 10ft MINIMUM. AUDIBLE ALARM SHALL BE A TEMPORAL 3 CODE FOR SMOKE ALARM SIGNAL AND TEMPORAL 4 CODE FOR CARBON MONOXIDE ALARM SIGNAL.
- 1.15.g. ALARM SILENCE BUTTON
- 1.15.h. TEST BUTTON
- 1.15.i. IN HANDICAP-ACCESSIBLE APARTMENTS; PROVIDE UNIT WITH ADA COMPLIANT, 110cd, XENON STROBE.
- 1.16. FACEPLATES: PROVIDE THERMOPLASTIC FACEPLATES WITH COLOR AND STYLE AS DIRECTED BY THE ARCHITECT IN ALL PUBLIC SPACES. PROVIDE STAINLESS STEEL FACEPLATES IN MECHANICAL AND ELECTRICAL SPACES. FACEPLATES SHALL BE INSTALLED FLAT AGAINST WALL. NO GAPS WILL BE ALLOWED.
- 1.17. ACCEPTABLE MANUFACTURERS FOR RECEPTACLES AND SWITCHES ARE COOPER ARROW-HART DECORATOR SERIES, LEVITON DECORA SERIES, LUTRON ARCHITECTURAL SERIES AND PASS & SEYMOUR DECORATOR SERIES.
- 1.18. ACCEPTABLE MANUFACTURERS FOR DIMMERS ARE LEVITON DECORA SERIES, LUTRON ARCHITECTURAL SERIES, PASS & SEYMOUR DECORATOR SERIES AND PHILIPS LIGHTING CONTROLS ARCHITECTURAL SERIES. PROVIDE ALL ASSOCIATED WIRING DEVICES, COMPONENTS, WIRING, ETC. AS REQUIRED TO MEET DESIGN INTENT.
- 1.18.a. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DIMMER AND BALLAST MANUFACTURERS TO ENSURE COMPATIBILITY OF DEVICES.
- 1.19. ACCEPTABLE MANUFACTURERS FOR COMBINATION SMOKE AND CARBON MONOXIDE DETECTORS ARE FIRST ALERT, GENTEX, KIDDE AND UNIVERSAL SECURITY INSTRUMENTS.
2. ALL RECEPTACLE OUTLETS INSTALLED WITHIN 6'-0" OF SINKS OR OTHER SOURCES OF WATER SHALL BE GROUND-FAULT, CIRCUIT-INTERRUPTING TYPE.
3. ALL RECEPTACLE OUTLETS INSTALLED IN DWELLING UNITS, INCLUDING ALL HOTEL GUESTROOMS, SHALL BE TAMPER-RESISTANT TYPE.
4. ALL RECEPTACLE OUTLETS SHALL BE INSTALLED WITH GROUNDING PIN LOCATED IN THE TOP POSITION.
5. ALL SWITCHES SHALL BE INSTALLED WITH "OFF" IN THE BOTTOM POSITION.
6. ALL SWITCHES FOR PROJECTION SCREENS, PROJECTOR LIFTS, AND/OR SHADES SHALL BE INSTALLED WITH "RAISE" IN THE TOP POSITION, "OFF" IN THE CENTER POSITION AND "LOWER" IN THE BOTTOM POSITION.
7. ALL EXTERIOR WIRING DEVICES SHALL BE PROVIDED WITH A WEATHER-PROOF "WHILE-IN-USE" COVER.
8. ALL WIRING DEVICES SHALL BE INSTALLED PLUMB, SQUARE AND TRUE. WIRING DEVICES INSTALLED IN ADJACENT LOCATIONS SHALL BE ALIGNED.
9. WIRING DEVICES INSTALLED AT A SINGLE LOCATION SHALL BE INSTALLED IN A MULTI-GANG BACK BOX WITH SUITABLE FACEPLATE WHEREVER POSSIBLE. PROVIDE BARRIERS AS REQUIRED BY CODE.
10. WIRING DEVICES ON NORMAL POWER SHALL BE COLORED AS DIRECTED BY THE ARCHITECT UNLESS NOTED OTHERWISE. WIRING DEVICES ON EMERGENCY POWER SHALL BE RED IN COLOR.
- R. FUSES – 262813:
1. FUSES SHALL BE CURRENT-LIMITING, DUAL-ELEMENT, TIME-DELAY TYPE WITH AN INTERRUPTING CURRENT CAPACITY OF 200,000RMS AMPERES AND A CONTINUOUS CURRENT RATING AS SHOWN ON DRAWINGS.
2. FUSES SHALL HAVE AN AVERAGE MELTING TIME-CURRENT CHARACTERISTIC TO MEET UNDERWRITERS' LABORATORIES REQUIREMENTS OF "CLASS K" FOR 0-600 AMP FUSES AND "CLASS L" FOR OVER 600 AMP FUSES.
3. ACCEPTABLE MANUFACTURERS ARE BUSSMAN, GOULD SHAWMUTT AND GENERAL ELECTRIC.
- S. ENCLOSED SWITCHES AND CIRCUIT BREAKERS – 262816:
1. DISCONNECT SWITCHES SHALL BE "QUICK-MAKE", "QUICK-BREAK" HEAVY DUTY WITH VOLTAGE RATINGS OF 600 VOLTS FOR 480/277-VOLT SYSTEMS AND 240 VOLTS FOR 208/120-VOLT SYSTEMS. PROVIDE SINGLE OR THREE PHASE WITH AMPERE RATINGS AS SHOWN ON DRAWINGS. U.L. 98 LISTED, NEMA KST. ENCLOSURES SHALL BE NEMA 1 FOR INDOOR AND NEMA 3R FOR OUTDOOR INSTALLATIONS.
- 1.1. ALL FUSED DISCONNECT SWITCHES SHALL BE PROVIDED WITH THE INSTALLED FUSE SIZE LISTED ON THE NAMEPLATE.
- 1.2. ACCEPTABLE MANUFACTURERS ARE EATON, GENERAL ELECTRIC, SIEMENS AND SQUARE D.



1 Device/Junction Box Grounding Detail  
SCALE: NONE

NOTES:  
1. UTILIZE SAME GROUNDING METHOD FOR SWITCHES.

FIRE ALARM GENERAL NOTES

- A. DEMOLITION WORK:
1. ALL SALVAGEABLE ITEMS SUCH AS SMOKE DETECTORS, AUDIO AND/OR VISUAL DEVICES, ETC. THAT ARE NOT TO BE REUSED SHALL BE TURNED OVER TO THE OWNER.
2. REFER TO ARCHITECTURAL PLANS FOR GENERAL DEMOLITION ITEMS SUCH AS CEILINGS, WALLS, ETC.
3. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER AS TO CONSTRUCTION SCHEDULING, SERVICE INTERRUPTIONS AND ACCESS TO WORK AREAS.
4. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION IN AREAS OF RENOVATION. ALL DEVICES, WIRE AND CONDUIT THAT ARE TO BE REMOVED SHALL BE STORED AS DIRECTED BY THE OWNER, OR RELOCATED AS SHOWN ON NEW FLOOR PLANS. APPROPRIATE MEASURES SHALL BE TAKEN TO ASSURE CONTINUITY OF EXISTING CIRCUITS WHERE REQUIRED. ALL OUTAGES WHICH MAY RESULT SHALL BE COORDINATED WITH THE OWNER PRIOR TO THE WORK AND APPROPRIATE "FIRE WATCHES" SHALL BE PROVIDED.
5. AS PART OF DEMOLITION WORK, THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR KEEPING EXISTING SYSTEMS (NOT SCHEDULED FOR REMOVAL) ENERGIZED. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SUPPORTS, WIRING DEVICES, WIRE AND CONDUIT AS REQUIRED TO KEEP EXISTING EQUIPMENT AND/OR DEVICES ACTIVE, WHETHER THEY SHARE THE SAME CIRCUITS AS DEMOLITION ITEMS OR NOT.
- B. NEW WORK:
1. ALL WORK SHALL COMPLY WITH THE 2013 EDITION OF THE NATIONAL FIRE ALARM & SIGNALING CODE (NFPA 72) AND THE 2017 EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70).
2. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DEVICES WHERE SHOWN ON THE PLANS. NEW WIRING FOR DEVICES, MODULES AND EQUIPMENT SHALL BE ROUTED TO THE MAIN CONTROL PANEL.
3. THE ELECTRICAL CONTRACTOR SHALL PROTECT ALL EXISTING DEVICES, MODULES, EQUIPMENT AND WIRING NOT SCHEDULED FOR REMOVAL. ENSURE DEVICES ARE PROPERLY SUPPORTED DURING AND AFTER THE WORK.
4. ALL EQUIPMENT, DEVICES, CABLING, ETC. NOT SCHEDULED FOR REMOVAL SHALL BE MAINTAINED AND KEPT IN OPERATION AT ALL TIMES.
5. FINAL CONNECTIONS AND TESTING OF THE SYSTEM SHALL BE PERFORMED BY THE BUILDING FIRE ALARM CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL OBTAIN THE SERVICES OF THE FIRE ALARM CONTRACTOR TO PERFORM THIS WORK.
6. PRIOR TO BID, THE ELECTRICAL CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH THE BUILDING FIRE ALARM CONTRACTOR AND INCLUDE IN HIS PRICE ALL WORK, EQUIPMENT, INTERCONNECTIONS AND PROGRAMMING THAT IS REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM.
7. THE OPERATION OF THE SYSTEM INSTALLATION DOES NOT CONSTITUTE AN ACCEPTANCE OF THE WORK BY THE OWNER. FINAL ACCEPTANCE IS TO BE MADE AFTER THE ELECTRICAL CONTRACTOR HAS DEMONSTRATED THAT THE WORK FULFILLS THE REQUIREMENTS FOR APPROVAL BY ALL AUTHORITIES HAVING JURISDICTION.
8. THE RISER SHOWN IS AN INDICATION OF THE WORK REQUIRED AND SHALL BE USED FOR ESTIMATING PURPOSES ONLY. THE SUCCESSFUL ELECTRICAL CONTRACTOR SHALL OBTAIN A POINT-TO-POINT WIRING DIAGRAM FROM THE BUILDING FIRE ALARM CONTRACTOR AND PERFORM ALL WORK IN ACCORDANCE WITH THAT DIAGRAM.
9. WHERE PERMITTED BY LOCAL CODES, AUDIO AND VISUAL DEVICES SHALL BE WHITE IN COLOR.
10. SMOKE DETECTORS SHALL NOT BE INSTALLED WITHIN 36" OF ANY SUPPLY DIFFUSERS REGARDLESS OF THEIR LOCATION SHOWN ON THE DRAWINGS. COORDINATE EXACT LOCATIONS WITH THE MECHANICAL CONTRACTOR.
11. FOR ALL DUCT DETECTORS LOCATED ABOVE ACCESSIBLE CEILINGS, PROVIDE ALARM INDICATOR IN ACCESSIBLE CEILING BELOW DETECTOR LOCATION AND REMOTE TEST SWITCH WHETHER SHOWN ON DRAWINGS OR NOT.
12. SYSTEM CABLES SHALL BE PLENUM-RATED UNLESS INSTALLED IN CONDUIT. SYSTEM CABLES ARE TO BE INSTALLED IN CONDUIT BELOW 96" AFF, WHERE ROUTED THROUGH WALLS OR ABOVE HARD CEILINGS, AND IN EXPOSED LOCATIONS. SYSTEM CONDUITS ARE TO BE INSTALLED AS HIGH AS POSSIBLE TO ABOVE ACCESSIBLE CEILING SPACE WITHIN 24" OF A CABLE SUPPORT.
13. ALL ROUTING OF CONDUIT FROM NEW DEVICES TO THE MAIN CONTROL PANEL SHALL BE DIRECTED AND APPROVED BY THE OWNER'S REPRESENTATIVE. OBTAIN PERMISSION FROM THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
14. PROVIDE PLASTIC BUSHING ON EACH CONDUIT TERMINATION.

FIRE ALARM SEQUENCE OF OPERATION NOTES

- A. OPERATION OF A MANUAL PULL STATION WILL:
1. ACTIVATE AUDIO AND/OR VISUAL DEVICES ON FLOOR IN ALARM, FLOOR BELOW AND FLOOR ABOVE.
2. ACTIVATE INQUIRY TONE THROUGHOUT THE BUILDING.
3. RELEASE DOOR HOLD-OPEN DEVICES
4. OPERATE DOOR RELEASE RELAYS TO OPEN LOCKED DOORS IN PATHS OF EGRESS.
5. DISPLAY ALARM AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
6. DISPLAY APPROPRIATE ZONE AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
7. ACTIVATE FIRE SIGN AT MAIN CONTROL PANEL.
8. CALL FIRE DEPARTMENT VIA CENTRAL STATION.
- B. OPERATION OF AN ALARM BY AREA HEAT DETECTOR OR AREA SMOKE DETECTOR WILL:
1. EFFECT SAME ACTIONS AS A MANUAL PULL STATION (A.1 TO A.8 ABOVE).
2. OPERATE ALL REQUIRED DAMPER RELAYS.
3. STOP ALL FANS SERVING FLOOR IN ALARM.
- C. OPERATION OF AN ELEVATOR LOBBY SMOKE DETECTOR OR WATER FLOW SWITCH WILL:
1. EFFECT SAME ACTIONS AS AN AREA HEAT OR SMOKE DETECTOR IN ALARM (B.1 TO B.3 ABOVE).
2. RECALL TO DESIGNATED FLOOR ALL ELEVATORS SERVING FLOOR IN ALARM.
- D. OPERATION OF A DUCT SMOKE DETECTOR WILL:
1. DISPLAY SUPERVISORY SIGNAL AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
2. DISPLAY APPROPRIATE ZONE AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
3. SHUTDOWN CORRESPONDING HVAC UNITS.
- E. OPERATION OF AN AREA CARBON MONOXIDE DETECTOR WILL:
1. ACTIVATE DETECTOR SOUNDER BASE WITH AN ALARM SIGNAL TEMPORAL CODE-4 TONE.
2. DISPLAY SUPERVISORY SIGNAL AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
3. DISPLAY APPROPRIATE ZONE AT MAIN CONTROL PANEL AND REMOTE ANNUNCIATOR(S).
4. CALL FIRE DEPARTMENT VIA CENTRAL STATION.
- I. TROUBLE SIGNALS FROM ALL DEVICES WILL BE DISPLAYED AT MAIN CONTROL PANEL.

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DATE	REV	DESCRIPTION	BY
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PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE: ELECTRICAL SPECIFICATIONS AND DETAILS			
SCALE:	AS NOTED	DRAWN BY: MM	DRAWING NO:
DATE:	11/15/22	CHECKED BY: BU	
PROJECT NO:	414003	APPROVED BY: BU	









FIRE PROTECTION SPECIFICATIONS

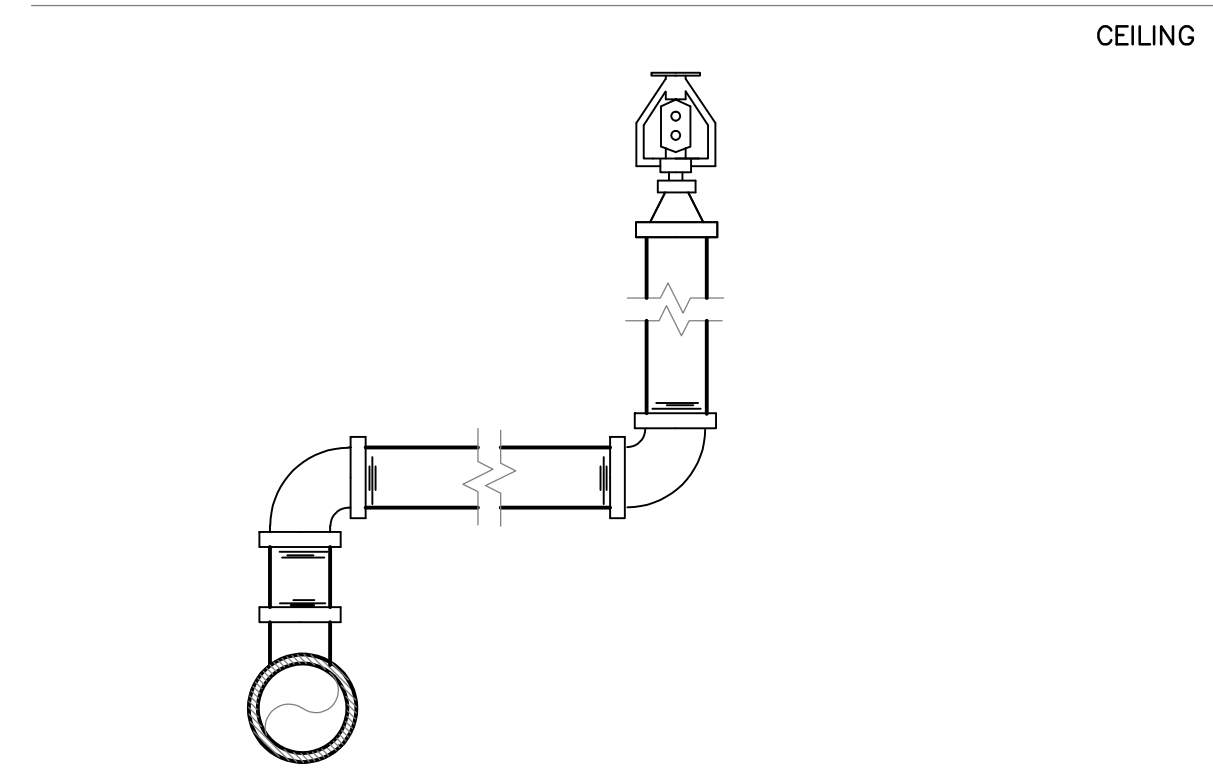
1. GENERAL - THESE SPECIFICATIONS FORMS THE BASIS OF A PERFORMANCE CONTRACT FOR INSTALLATION OF A COMPLETE SPRINKLER SYSTEM AT THE REFERENCE PROPERTY.
- 1.1 REQUIREMENTS
- A. THE FIRE PROTECTION CONTRACTOR (ALSO REFERRED TO AS CONTRACTOR) SHALL BE A LICENSED, AUTHORIZED INSTALLER OF FIRE PROTECTION SYSTEMS AND SHALL HAVE A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF FIRE PROTECTION SYSTEMS. THE SYSTEM DESIGNER SHALL BE LICENSED BY THE STATE OF CONNECTICUT
- B. BEFORE SUBMITTING BID, THE FIRE PROTECTION CONTRACTOR SHALL VISIT THE SITE AND BECOME FULLY FAMILIAR WITH THE EXISTING CONDITIONS. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION TAKEN PLACE.
- C. PRIOR TO SUBMITTING THE PROPOSAL, THE CONTRACTOR SHALL INFORM THE ARCHITECT AND/OR ENGINEER OF ANY DISCREPANCIES OR REQUEST CLARIFICATION IN WRITING CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE FIRE PROTECTION INSTALLATION. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA DESIGN, LABOR, EQUIPMENT OR MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.
- D. THE SCHEDULING OF THE FIRE PROTECTION WORK SHALL BE COORDINATED WITH THE BUILDING OWNER, CONSTRUCTION MANAGER AND THE OTHER TRADES.
- E. ANY NECESSARY SHUT-DOWNS OF BASE BUILDING FIRE PROTECTION SYSTEM MUST BE COORDINATED WITH THE BUILDING OWNER, FIRE DEPARTMENT AND CONSTRUCTION MANAGER.
- 1.2 WORK INCLUDED
- A. ALL WORK SHALL COMPLY WITH NFPA STANDARDS, LOCAL AND STATE BUILDING AND FIRE CODES, LOCAL FIRE MARSHAL REQUIREMENTS, AND OWNER'S INSURANCE COMPANY.
- B. ALL DRAIN AND TEST PIPING SHALL TERMINATE AT ARCHITECT AND/OR ENGINEER APPROVED BUILDING EXTERIOR LOCATIONS UNLESS OTHERWISE NOTED. FINISH OF EXTERIOR PIPING SHALL BE SELECTED BY ARCHITECT.
- C. PROVIDE ALL REQUIRED AUXILIARY DRAIN ASSEMBLIES FOR COMPLETE DRAINAGE OF SYSTEM PER NFPA STANDARDS. PROVIDE ACCESS PANEL IF DRAIN IS LOCATED ABOVE HARD CEILING.
- D. PROVIDE SPRINKLER COVERAGE IN ALL COMBUSTIBLE CONCEALED SPACES IN ACCORDANCE WITH NFPA 13 REQUIREMENTS.
- E. PROVIDE SPRINKLER COVERAGE FOR ALL EXTERIOR CANOPIES OVER 4 FT. IN WIDTH, IF REQUIRED IN ACCORDANCE WITH NFPA STANDARDS.
- F. PROVIDE SPRINKLER HEADS BELOW ALL EXPOSED DUCTWORK GREATER THAN 4 FT. IN WIDTH IN ACCORDANCE WITH NFPA 13. ALSO PROVIDE COMPLETE SPRINKLER PROTECTION BELOW ALL OTHER DUCTS/OBSTRUCTIONS IN ACCORDANCE WITH THE OBSTRUCTION REQUIREMENTS IN NFPA 13.
- G. ENSURE THAT PIPE SIZES ARE ADEQUATELY SIZED FOR NUMBER OF SPRINKLER HEADS ON EACH BRANCHLINE AND CROSSMAIN BY PERFORMING HYDRAULIC CALCULATIONS FOR THE SYSTEM BASED UPON A CURRENT WATERFLOW TEST. PROVIDE A HYDRAULIC CALCULATION FOR EACH HAZARD CLASSIFICATION. PROVIDE ANY ADDITIONAL CALCULATIONS REQUESTED BY THE ENGINEER.
- H. HYDRAULIC CALCULATIONS FRICTION LOSS MUST NOT EXCEED 0.3 PSI/FT. CALCULATIONS MUST BE FIGURED BACK TO THE WATER SUPPLY AND INCLUDE A MINIMUM 10 PSI OR 10% GAP (CUSHION) BETWEEN THE REQUIRED PRESSURE AND THE AVAILABLE WATER SUPPLY PRESSURE AT THE REQUIRED FLOW.
- I. TOTAL DEMAND MUST BE BROUGHT BACK TO THE WATER SUPPLY AT THE RESIDUAL HYDRANT TEST LOCATION.
- J. CONTRACTOR MUST PROVIDE A DRAWING OR A SCHEMATIC RISER DIAGRAM INDICATING SIZES AND LENGTHS OF PIPE, NUMBER AND TYPES OF FITTINGS, VALVES, ETC. FROM THE FIRE PROTECTION RISER TO THE CITY WATER SUPPLY.
- K. SPRINKLER HEAD LAYOUT SHALL BE BASED ON THE LOCATIONS INDICATED ON THE PLANS AND MAY NOT NECESSARILY SHOW ALL REQUIRED HEADS.
- L. THE CONTRACTOR SHALL COORDINATE THE WORK WITH EXISTING CONDITIONS AND WITH THE NEW WORK OF ALL OTHER TRADES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICTS BETWEEN TRADES BEFORE INSTALLATION OF SPRINKLER SYSTEM.
- M. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. ANY DIMENSIONS NOT SHOWN SHALL BE OBTAINED FROM THE ARCHITECTURAL DRAWINGS. FOR EXACT LOCATIONS, MOUNTING HEIGHTS, ETC., REFER TO ARCHITECTURAL DRAWINGS AND DETAILS. ALL DIMENSIONS AND LOCATIONS OF EXISTING CONDITIONS SHALL BE FIELD VERIFIED.
- N. SUBMIT A COMPLETE SET OF DRAWINGS AND HYDRAULIC CALCULATIONS FOR REVIEW AND RECEIVE APPROVAL FROM ENGINEER, THE AUTHORITY HAVING JURISDICTION, AND FROM OWNER'S INSURANCE COMPANY IF REQUIRED, PRIOR TO ORDERING OR INSTALLING ANY PIPE, FITTINGS, DEVICES AND EQUIPMENT.
- O. PROVIDE CURRENT (WITHIN ONE YEAR) WATER SUPPLY DATA ON SHOP DRAWINGS INCLUDING HYDRANT LOCATIONS AND ELEVATION OF GAUGED HYDRANT. IF CURRENT TEST IS NOT AVAILABLE, CONTRACTOR SHALL REQUEST AND PAY FOR NEW WATERFLOW TEST.
- P. IF HAZARDOUS MATERIALS ASSOCIATED WITH THE FIRE PROTECTION SYSTEM ARE SUSPECTED OR DISCOVERED, IMMEDIATELY CONTACT THE OWNER IN WRITING SO THAT OWNER CAN ARRANGE FOR INVESTIGATION AND ANY REQUIRED ABATEMENT OF MATERIALS.
- Q. CONFIRM WITH OWNER'S REPRESENTATIVE OR ARCHITECT THAT 40 DEG. FAHRENHEIT MINIMUM WILL BE MAINTAINED THROUGHOUT ALL "WET-PIPE" SPRINKLERED AREAS. NOTIFY ARCHITECT AND ENGINEER IF THIS CANNOT BE MAINTAINED.
- R. CONTRACTOR SHALL PROVIDE AN ALLOWANCE FOR AN ADDITIONAL 20 HEADS ALONG WITH 10 FT. OF ASSOCIATED PIPE, FITTINGS & HANGER ASSEMBLY FOR EACH HEAD AS PART OF THE BASE BID TO ACCOMMODATE FIELD CONDITIONS.
- 1.3 ALTERNATED
- A. PROVIDE ADD/ALTERNATE PRICE TO PROVIDE FIRE PUMP IF WATER FLOW TEST AND HYDRAULIC CALCULATION DETERMINE THAT THE STREET PRESSURE IS INSUFFICIENT.
- 1.4 SUBMITTALS
- A. THE CONTRACTOR SHALL SUBMIT AND RECEIVE APPROVAL (PRIOR TO ORDERING MATERIALS AND INSTALLATION) FOR MATERIAL SUBMITTALS, HYDRAULIC CALCULATIONS, AND FULLY COORDINATED SHOP DRAWINGS INCLUDING:
- SHOP DRAWINGS AND HYDRAULIC CALCULATIONS, BOTH SIGNED AND SEALED BY A PE OR NICET (LEVEL III OR IV) CERTIFIED IN FIRE SPRINKLER DESIGN
  - COMPLETE SCHEMATIC RISER DIAGRAM, SITE PLAN, AND FULL HEIGHT BUILDING CROSS-SECTION
  - BACKFLOW PREVENTER, IF PART OF CONTRACT
  - FIRE PUMP, JOCKEY PUMP, CONTROLLERS, ETC. FOR A COMPLETE ASSEMBLY
  - SPRINKLER HEADS
  - PIPE, FITTINGS, AND COUPLINGS
  - CONTROL VALVE WITH BUILT IN TAMPER SWITCH AND OTHER VALVES
  - RISER CHECK VALVE ASSEMBLY
  - DRY PIPE VALVE ASSEMBLY
  - AIR COMPRESSOR ASSEMBLY
  - AUTOMATIC AIR VENT ASSEMBLY
  - FIRE DEPARTMENT CONNECTION
  - HORN STROBE
  - SPRINKLER HEAD CABINET & WRENCH
  - SIGNAGE, PIPE MARKERS, HYDRAULIC PLACARDS, AND VALVE TAGS & VALVE TAG CHART
  - HANGERS AND SUPPORTS INCLUDING SEISMIC BRACING, IF REQUIRED
  - UL LISTED FIRE STOPPING ASSEMBLY
  - ALL OTHER DEVICES AND EQUIPMENT, ETC.
- B. SHOP DRAWINGS/SUBMITTALS SHALL BE REVIEWED UP TO TWO TIMES BY ENGINEER. SHOULD CONTRACTOR FAIL TO MAKE ALL CORRECTIONS REQUIRED BY ENGINEER OR SHOULD ADDITIONAL REVIEWS BE REQUIRED, CONTRACTOR SHALL BE RESPONSIBLE FOR BACK CHARGES FOR ADDITIONAL REVIEW TIME PERFORMED BY ENGINEER.
- C. PROVIDE AS-BUILT RECORD DRAWINGS. AS-BUILT DRAWINGS SHALL BE PREPARED USING AUTOCAD AND SUBMITTED ELECTRONICALLY (DWG AND PDF FORMATS) ALONG WITH HARD COPIES FOR REVIEW BY OWNER AND ENGINEER. ALL APPROVED DRAWINGS, CALCULATIONS, MATERIAL DATA SHEETS, ETC. SHALL BECOME PROPERTY OF THE OWNER.
- 1.4 BUILDING DEPARTMENT FILING, PERMITS AND CERTIFICATES
- A. THE CONTRACTOR SHALL FILE ALL REQUIRED DRAWINGS, MATERIAL DATA, AND SPECIFICATIONS WITH THE AUTHORITIES HAVING JURISDICTION AND BE RESPONSIBLE FOR OBTAINING PERMITS AND FINAL APPROVALS.
- B. THE CONTRACTOR SHALL ARRANGE FOR INSPECTIONS AND TESTS OF ANY AND ALL PARTS OF THE WORK AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY ALL CHARGES FOR SAME. INCLUDE ALL SIGNED-OFF INSPECTIONS AND TEST CERTIFICATES WITH AS-BUILT DOCUMENTS.
2. MATERIALS
- 2.1 GENERAL
- A. THE FIRE PROTECTION SYSTEM SHALL BE COMPLETE WITH ALL PIPE, FITTINGS, VALVES, DRAINAGE SYSTEM AND VALVES, SPRINKLER HEADS, HANGERS AND SUPPORTS INCLUDING MISCELLANEOUS ITEMS SUCH AS SIGNAGE, VALVE TAGS, ETC. AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR A COMPLETE, FULLY OPERABLE, AND APPROVED FIRE PROTECTION SYSTEM.
- B. ALL PIPE FITTINGS, HANGERS, SUPPORTS, SPRINKLER HEADS, ETC. SHALL CONFORM TO THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION AND THE NATIONAL FIRE PROTECTION ASSOCIATION REQUIREMENTS AS TO TYPES OF MATERIALS, ARRANGEMENT, SIZES AND INSTALLATION. REDUCING BUSHINGS ARE NOT PERMITTED. REDUCING FITTINGS SHALL BE PROVIDED IN LIEU OF BUSHINGS.
- C. ALL MATERIALS MUST BE RATED FOR HIGHEST ANTICIPATED PRESSURES AND IN NO CASE LESS THAN 175 PSI.
- 2.2 FIRE PROTECTION PIPING AND FITTINGS
- A. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE; 2½" AND LARGER MAY BE SCH. 10 FOR WET SYSTEMS ONLY. ALL DRY SYSTEM PIPING MUST BE BLACK STEEL SCH. 40 ONLY. PIPING SUBJECT TO INTERIOR ALTERNATING WET AND DRY CONDITIONS SUCH AS DRAIN AND FIRE DEPARTMENT CONNECTION PIPING SHALL BE SCH. 40 GALVANIZED WITH GALVANIZED FITTINGS. ALL FLANGED AND THREADED FITTINGS SHALL BE BLACK CAST IRON. GROOVED FITTINGS SHALL BE DUCTILE IRON.
- B. VICTAULIC VICFLEX SPRINKLER FITTINGS SERIES AH2 BRAIDED (AND CORRUGATED) FLEXIBLE HOSE ASSEMBLIES MAY BE USED TO ARM-OVER TO PENDENT TYPE SPRINKLER HEADS AS LONG AS THE LARGEST EQUIVALENT LENGTH LISTED FOR THE LONGEST HOSE AND MAXIMUM NO. OF BENDS AT A 2" RADIUS WITH A STRAIGHT 5.75" REDUCER IS USED IN THE HYDRAULIC CALCULATIONS. A CHART MUST BE PROVIDED ON THE DRAWINGS INDICATING VICFLEX FITTINGS ANTICIPATED WITH LENGTH, NUMBER OF BENDS, DEGREE OF BENDS, REDUCER AND BRACKETS.
- B. ALL EXPOSED PIPE & FITTINGS SHALL BE PROPERLY PREPPED FOR PAINTING BY OTHERS UNLESS OTHERWISE NOTED. PAINTING IS NOT PART OF THE FIRE PROTECTION SCOPE OF WORK.
- 2.3 SPRINKLER HEADS
- A. ALL SPRINKLER HEADS SHALL BE U.L. LISTED, F.M. APPROVED, AND QUICK RESPONSE TYPE UNLESS OTHERWISE NOTED. ARCHITECT TO SELECT ALL FINISHES AND COLORS FOR SPRINKLER HEADS.
- B. SPRINKLER HEADS INSTALLED IN CEILINGS SHALL BE CONCEALED PENDENT TYPE WITH FACTORY PAINTED SOLID,

- FLAT COVERPLATES SIMILAR TO RELIABLE G5-56 OR APPROVED EQUAL.
- C. SPRINKLER HEADS INSTALLED ON EXPOSED PIPING SHALL BE BRASS EITHER UPRIGHT OR PENDENT TYPE SIMILAR TO RELIABLE MODEL F1FR OR APPROVED EQUAL.
- D. PENDENT SPRINKLER HEADS INSTALLED IN AREAS SUBJECT TO TEMPERATURES BELOW 40°F MUST BE CONCEALED DRY PENDENT TYPE WITH FACTORY PAINTED FLAT COVERPLATES AND CORROSION RESISTANT COATING SIMILAR TO RELIABLE G5-56ORR OR APPROVED EQUAL. (PROVIDE DECKTITE FLASHING RELIABLE FOR PROPER SEAL ARRANGEMENT AND MINIMUM EXPOSED BARREL LENGTH IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.)
- E. IF APPLICABLE, SPRINKLER HEADS INSTALLED IN ATTIC SPACES MAY BE TYCO BB, SD, HIP, AND AP SPECIFIC APPLICATION SPRINKLERS FOR PROTECTING ATTICS INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS OR APPROVED EQUAL.
- F. SIDEWALL SPRINKLER HEADS SHALL BE HORIZONTAL TYPE WITH CHROME FINISH SIMILAR TO RELIABLE MODEL F1FR OR APPROVED EQUAL.
- G. DRY HORIZONTAL SIDEWALL SPRINKLER HEADS AND ESCUTCHEONS SHALL BE CORROSION RESISTANT TYPE OR HAVE A NON-CORROSIVE COATING SIMILAR TO RELIABLE MODEL FQJR DRY OR APPROVED EQUAL.
- H. CONTRACTOR SHALL FURNISH A MINIMUM OF SIX SPRINKLER HEADS IN A SPRINKLER HEAD CABINET WITH A SPRINKLER WRENCH IN ACCORDANCE WITH NFPA 13. SPRINKLERS SHALL CORRESPOND TO THE TYPE AND TEMPERATURE RATINGS OF THE SPRINKLER HEADS ON THE PROPERTY.
- 2.4 VALVES
- A. INTERIOR CONTROL VALVES 2" AND SMALLER
1. BUTTERFLY TYPE SLOW CLOSE INDICATING VALVE WITH BUILT-IN TAMPER SWITCH, 300 PSI OR,
2. OS&Y GATE TYPE THREADED BRONZE, 300 PSI, (WITH EXTERNAL TAMPER SWITCH).
- B. INTERIOR CONTROL VALVES 2½" TO 6"
1. TIGHT CLOSING, EPOXY COATED DUCTILE IRON, ELASTOMER ENCAPSULATED DISC, GROOVED TYPE BUTTERFLY VALVES, 300 PSI, WITH STAINLESS STEEL SHAFT, LIFETIME BEARINGS, HAND WHEEL, GEAR OPERATOR WITH POSITION INDICATOR, AND BUILT-IN TAMPER SWITCH. SIMILAR TO: VICTAULIC "FIRELOCK", SERIES 705W WRD OR APPROVED EQUAL.
2. O.S.&Y, BOLTED BONNET, RESILIENT WEDGE, EPOXY COATED BODY INSIDE AND OUT, FLANGED END CONNECTIONS, LISTED BY UL, FM APPROVED, 300 PSI SIMILAR TO NIBCO F-697-0 OR APPROVED EQUAL. ALL CONTROL VALVES ON THE SUCTION SIDE OF THE FIRE PUMP MUST BE O.S.&Y. TYPE.
- C. CHECK VALVES
1. 2" AND SMALLER SHALL BE SWING TYPE, BRONZE, THREADED, RUBBER DISC, 200 PSI WWP, SIMILAR TO NIBCO, MODEL KT-403-W OR APPROVED EQUAL.
2. 2½" AND LARGER SHALL BE GROOVED, 250 PSI, SIMILAR TO VICTAULIC SERIES 717 OR APPROVED EQUAL.
- D. RISER CHECK VALVE ASSEMBLY
1. GROOVED CHECK VALVE INCLUDING 2" MAIN DRAIN AND TWO PRESSURE GAUGES EACH WITH A MAINTENANCE VALVE, (AND WATERFLOW SWITCH), SIMILAR TO VICTAULIC, MODEL 717R OR APPROVED EQUAL.
- E. DRY PIPE VALVE ASSEMBLY
1. PROVIDE FLANGED OR GROOVED DRY PIPE VALVE ASSEMBLY WITH ALARM SWITCHES TO ACTUATE BUILDING FIRE ALARM SYSTEM AND LOCAL ELECTRIC ALARM BELL, LOW AIR SUPERVISORY SWITCH, DRAINS, GAUGES, TEST APPARATUS WITH REQUIRED ACCESSORIES, ANTI-WATER COLUMN DEVICE, TANK MOUNTED AIR COMPRESSOR, ACCELERATOR, ANTI-FLOODING DEVICE, AND PRESSURE MAINTENANCE DEVICE. THE DRY PIPE VALVE SHALL BE A POSITIVE LATCHING CLAPPER, DIFFERENTIAL TYPE DRY VALVE. DRY PIPE VALVE SHALL BE RE-SETTABLE WITH A RESETTING BAR AND NOT REQUIRE PRIMING. DRY VALVE SHALL BE UL LISTED AND FACTORY MUTUAL APPROVED. AIR PRESSURE TO WATER PRESSURE RATIO SHALL BE APPROXIMATELY 1 TO 8. DRY VALVE TRIM PIPING SHALL BE GALVANIZED. SIMILAR TO RELIABLE MODEL D OR APPROVED EQUAL.
2. PROVIDE ACCELERATOR ASSEMBLY IF NECESSARY TO MEET NFPA TRIP TIME REQUIREMENTS.
3. ALL WIRING BETWEEN BUILDING FIRE ALARM PANEL AND DRY PIPE SYSTEM IS THE RESPONSIBILITY OF ELECTRICAL CONTRACTOR.
4. PROVIDE A TANK MOUNTED, ELECTRIC MOTOR-DRIVEN, OIL LESS AIR COMPRESSOR. THE AIR COMPRESSOR ASSEMBLY SHALL BE FACTORY MUTUAL APPROVED AS AN AIR MAINTENANCE DEVICE. SIMILAR TO GENERAL AIR PRODUCTS MODEL OLT SERIES OR APPROVED EQUAL.
5. PROVIDE AIR CAPACITY OF SYSTEM ON SHOP DRAWINGS.
- 2.5 FIRE DEPARTMENT CONNECTION
- A. 6" X 2½" X 2½" X 2½" THREADED FIRE DEPARTMENT CONNECTION CAST BRASS BOTTOM INLET BODY, BRASS TUBING, BRASS BANDED PLATE, CAST BRASS CAPS & CHAINS, SIMILAR TO GROKER 6630, WITH POLISHED CHROME PLATED FINISH. PROVIDE IDENTIFICATION BASE PLATE. STYLE AND LOCATION TO BE APPROVED BY THE LOCAL FIRE DEPARTMENT; FINISH TO BE APPROVED BY THE ARCHITECT.
- 2.6 AIR VENT
- A. PROVIDE AN AUTOMATIC FLOAT TYPE AIR VENT WITH PAN IN MOST REMOTE PIPING ON EACH LEVEL TO REDUCE THE AMOUNT OF AIR TRAPPED IN A PRESSURIZED SPRINKLER SYSTEM SIMILAR TO POTTER PAAR-B OR APPROVED EQUAL. ACCESS PANEL IF LOCATED ABOVE HARD CEILING.
- 2.6 SUPERVISORY AND ALARM ACTUATING DEVICES
- A. CLOSED CIRCUIT OS&Y TYPE VALVE TAMPER SWITCHES TO OPERATE WITHIN TWO REVOLUTIONS OF VALVE WHEEL, SIMILAR TO POTTER ELECTRIC SIGNAL CO. MODEL OSYSU-2.
- B. CLOSED CIRCUIT BALL TYPE VALVE TAMPER SWITCHES TO MONITOR FULL OPEN POSITION OF BALL VALVE, BUILT-IN MODEL, SIMILAR TO POTTER ELECTRIC SIGNAL CO. MODEL RBVS.
- C. CLOSED CIRCUIT PADDLE-TYPE WATERFLOW INDICATORS WITH RETARDING DEVICE TO PREVENT FALSE ALARMS FROM SURGES:
1. 1½" AND SMALLER SIMILAR TO POTTER ELECTRIC SIGNAL, MODEL VSR-S
2. 2" AND LARGER SIMILAR TO POTTER ELECTRIC SIGNAL, MODEL VSR-FE-2.
- D. ALL WIRING FROM DEVICES TO MAIN FIRE ALARM PANEL BY ELECTRICAL CONTRACTOR.
- 2.7 ALARM INDICATING DEVICES
- A. PROVIDE A UL LISTED 6" ELECTRIC BELL AND COORDINATE EXTERIOR LOCATION WITH FIRE DEPARTMENT AND ARCHITECT. WIRING FROM DEVICE TO MAIN FIRE ALARM PANEL BY ELECTRICAL CONTRACTOR.
- 2.8 HANGERS
- A. HANGER COMPONENTS SHALL BE CARBON STEEL TYPE.
- B. HANGER RINGS SHALL BE SWIVEL RING OR CLEVIS TYPE.
- C. ANCHORS USED IN CONCRETE INSTALLATIONS SHALL BE LISTED FOR CRACKED CONCRETE AND BE SIMILAR TO POWERS SNAKE+ OR APPROVED EQUAL. USE OF ANCHORS MUST BE SUITABLE FOR THE TYPE AND DEPTH OF CONCRETE CONSTRUCTION WITH USE SUBJECT TO APPROVAL BY STRUCTURAL ENGINEER.
- D. TOP BEAM CLAMPS USED FOR STEEL BEAM INSTALLATIONS SHALL HAVE RETAINING STRAPS.
- E. SEISMIC BRACING MUST MEET STATE AND LOCAL BUILDING CODES AND NFPA 13 CRITERIA.
3. INSTALLATION
- 3.1 CUTTING AND PATCHING
- A. DO ALL CUTTING NECESSARY FOR THE INSTALLATION OF THE FIRE PROTECTION WORK. ACCURATELY LAY OUT WORK FOR WHICH CUTTING IS REQUIRED TO AVOID UNNECESSARY LARGE OPENINGS. CUTTING OF BEAMS, JOISTS, FLOORS OR WALLS OF THE BUILDING WILL NOT BE PERMITTED EXCEPT AFTER RECEIVING WRITTEN APPROVAL FROM THE BUILDING OWNER OR CONSTRUCTION MANAGER.
- B. PROVIDE FIRE STOPPING AT ALL PENETRATIONS THROUGH RATED CONSTRUCTION. FIRE STOPPING SHALL BE A UL LISTED ASSEMBLY SIMILAR TO HILTI FIRESTOP SYSTEMS.
- 3.2 WATERTIGHT SLEEVES
- A. PROVIDE SCH. 40 GALVANIZED STEEL PIPE WITH INTEGRAL WATER STOP AT ALL FOUNDATION WALLS AND SLABS. PROVIDE SEAL BETWEEN SLEEVE AND PIPE WITH INTERLOCKING EXPANDABLE SYNTHETIC RUBBER LINKS, ASSEMBLED WITH CORROSION RESISTANT BOLTS, NUTS AND PRESSURE PLATES SIMILAR TO LINK-SEAL.
- 3.3 PIPE
- A. PITCH ALL DRY PIPING IN ACCORDANCE WITH NFPA 13 AND INDICATE ON SHOP DRAWINGS.
- 3.4 SPRINKLER HEADS
- A. WHERE MAXIMUM CEILING TEMPERATURES EXCEED 100°F, PROVIDE PROPER TEMPERATURE SPRINKLER HEADS IN ACCORDANCE WITH NFPA 13.
- B. INSTALL SPRINKLER HEADS AT CEILING ALIGNED WITH ADJACENT HEADS AND OTHER CEILING FEATURES. ALL HEADS SHALL BE INSTALLED CENTER-OF-TILE.
- C. LOCATE AND INSTALL SPRINKLER HEADS IN ACCORDANCE WITH NFPA AND MANUFACTURER SPECIFICATIONS. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND CONTRACT DRAWINGS FOR SPRINKLER HEAD LOCATION. NOTIFY ARCHITECT AND ENGINEER IN WRITING IF THERE ARE ANY DISCREPANCIES.
- 3.5 VALVES
- A. CONTROL VALVES, AUXILIARY DRAIN AND MAIN DRAIN VALVES, AND INSPECTOR'S TEST CONNECTION VALVES SHALL BE READABLY ACCESSIBLE AND INSTALLED NO GREATER THAN 7'-0" ABOVE FINISHED FLOOR. PROVIDE IDENTIFICATION SIGNS AND TAGS FOR ALL VALVES. PROVIDE ELECTRONIC SUPERVISION FOR ALL CONTROL VALVES.
- 3.6 INSERTS, HANGERS, ETC.
- A. ALL PIPING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN ACCORDANCE WITH NFPA STANDARDS, LOCAL CODES, AUTHORITY HAVING JURISDICTION, AND THE STRUCTURAL ENGINEER.
- B. FIRE PROTECTION PIPING OR HANGERS SHALL NOT BE USED TO SUPPORT NON-SYSTEM COMPONENTS.
- C. FIRE PROTECTION PIPING SHALL NOT BE ATTACHED DIRECTLY TO THE ROOF DECKING.
- D. WHEN FIRE PROTECTION PIPING IS INSTALLED BELOW DUCTWORK, PIPING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE, NOT FROM THE DUCTWORK OR THE CEILING SHEATHING.
- E. THE MAXIMUM DISTANCE BETWEEN HANGERS SHALL NOT EXCEED 12 FEET FOR 1" AND 1-1/4" PIPE SIZES AND 15 FEET FOR PIPE SIZES 1-1/2" AND LARGER.
- F. WHERE SYSTEM PRESSURE EXCEEDS 100 PSI, PROVIDE PROPER RESTRAINT FOR STEEL PIPE ARM-OVERS GREATER THAN 12" SUPPLYING PENDENT SPRINKLER TO RESIST UPLIFT FORCES, AND FOR PIPE SUPPLYING SIDEWALL SPRINKLERS TO PREVENT MOVEMENT PER NFPA 13.
- G. PER STRUCTURAL DRAWING S100 DATED 12/6/19, BUILDING IS A SEISMIC DESIGN CATEGORY B THEREFORE NO SEISMIC HANGERS ARE REQUIRED. VERIFY WITH STRUCTURAL ENGINEER AND ARCHITECT.
- 3.7 ESCUTCHEONS
- A. PROVIDE CHROME PLATED METAL ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS, PARTITIONS, FLOORS AND CEILINGS. ESCUTCHEONS SHALL BE HELD IN PLACE BY INTERNAL TENSION DEVICE OR A SET SCREW.
- 3.8 CONTRACTOR TO PROVIDE VALVE TAGS, PIPE MARKERS, AND PROPER SIGNAGE.

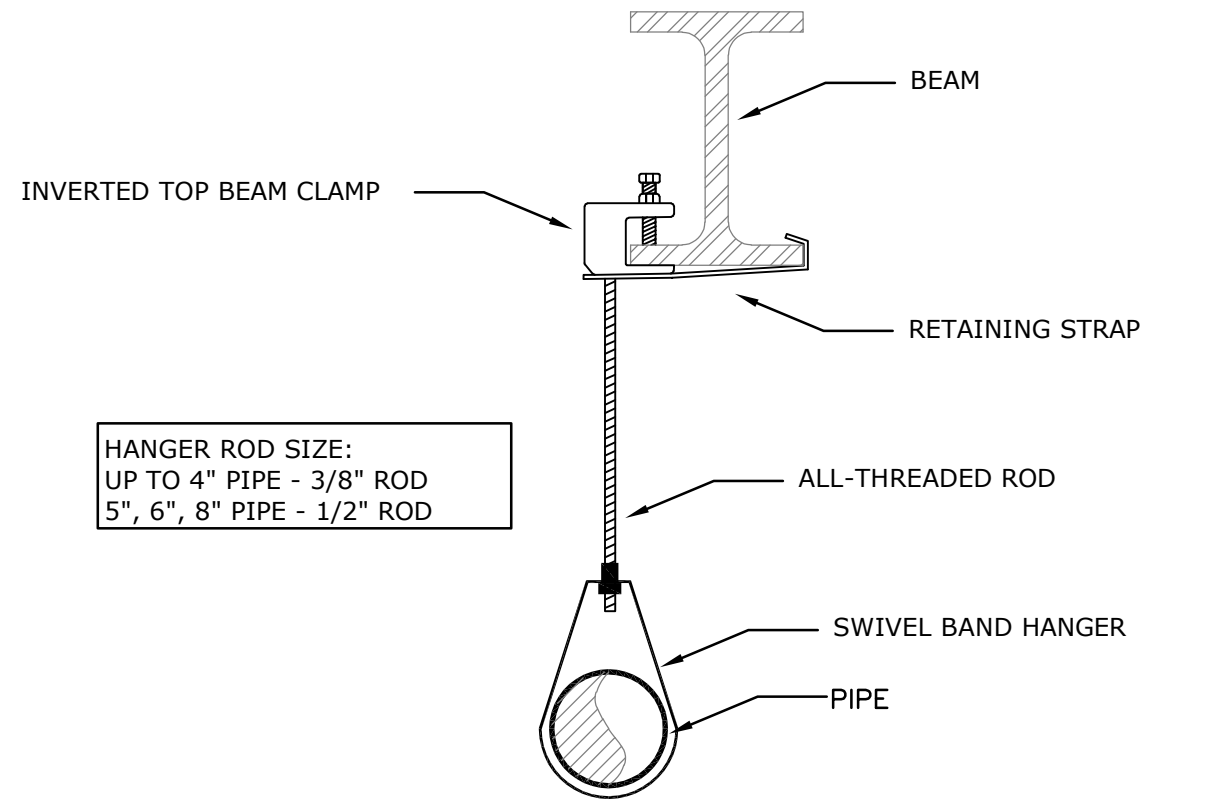
- 3.9 INSPECTIONS AND TESTING
- A. THE FIRE PROTECTION SYSTEM AND EQUIPMENT SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AND STATE BUILDING CODES, NFPA CODES, AND MANUFACTURER'S INSTRUCTIONS.
- B. THE FIRE PROTECTION SYSTEM SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST FOR A PERIOD OF TWO HOURS AT A PRESSURE OF AT LEAST 200 PSI OR 50 PSI OVER THE HIGHEST WORKING PRESSURE (WHICHEVER IS GREATER).
- C. IN ADDITION TO THE HYDROSTATIC TEST, AN AIR PRESSURE LEAKAGE TEST AT 40 PSI SHALL BE CONDUCTED FOR 24 HOURS FOR DRY PIPE AND DOUBLE INTERLOCK PREACTION SYSTEMS IN ACCORDANCE WITH NFPA 13.
- D. BEFORE THE SPRINKLER SYSTEM IS CONCEALED, THE BUILDING AND FIRE DEPARTMENT SHALL BE NOTIFIED THAT THE SYSTEM IS READY FOR INSPECTIONS AND TESTING. THE BUILDING AND/OR FIRE DEPARTMENT INSPECTOR SHALL WITNESS THE TEST. THE CONTRACTOR SHALL OBTAIN FINAL APPROVAL OF THE FIRE PROTECTION SYSTEM FROM THE BUILDING AND/OR FIRE DEPARTMENT AS REQUIRED.
- E. CONTRACTOR SHALL BE RESPONSIBLE FOR ARRANGING AND COORDINATING ALL REQUIRED PROGRESS INSPECTIONS WITH THE OWNER'S APPROVED INSPECTOR. A MINIMUM 72 HOURS NOTICE SHALL BE PROVIDED PRIOR TO THE INSPECTION. CONTRACTOR SHALL NOTIFY CONSTRUCTION MANAGER/OWNER. INSPECTIONS MUST BE MADE BEFORE WORK IS COVERED.
- G. PROVIDE TRAINING TO OWNER DESIGNATED REPRESENTATIVE(S) FOR OPERATING, TESTING AND MAINTENANCE OF PUMPS; ALLOW EIGHT HOURS FOR TRAINING.
4. CLOSING DOCUMENTS
- 4.1 OPERATION AND MAINTENANCE MANUALS
- A. PROVIDE FOUR OPERATION AND MAINTENANCE (O&M) MANUALS. O&M MANUALS SHALL INCLUDE AS-BUILT RECORD DRAWINGS AND HYDRAULIC CALCULATIONS WITH HYDRAULIC SUMMARY, VALVE TAG CHARTS, SIGNED AND WITNESSED COPIES OF ALL TESTING AND INSPECTION FORMS, MATERIALS SUBMITTALS WITH OPERATION AND MAINTENANCE INFORMATION, AND AN INDEX OF ALL PAGES. FURTHER, PROVIDE A USB KEY CONTAINING ALL CAD FILES AND HYDRAULIC CALCULATIONS.
- B. PROVIDE PAMPHLET NFPA 25 INSPECTION, TESTING, AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS.
- 4.2 GUARANTEE
- A. GUARANTEE ALL WORK, MATERIALS AND DEVICES FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. PROVIDE ANY REQUIRED INSPECTION, TESTING, MAINTENANCE, AND REPLACE OR REPAIR ANY MATERIALS IN A MANNER APPROVED BY THE ARCHITECT, ENGINEER OR OWNER WITHOUT ANY COST TO THE OWNER, ANY PART OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITHIN THE PERIOD OF THE GUARANTEE.

SAFETY NOTES:

1. PERFORM WORK IN ACCORDANCE WITH ALL STATE AND LOCAL BUILDING AND FIRE CODES.
2. WORK SHALL BE PERFORMED DURING NORMAL WORKING HOURS MONDAY TO FRIDAY UNLESS DIRECTED OTHERWISE.
3. NO MEANS OF EGRESS SHALL BE BLOCKED.
4. BUILDING SERVICES SHALL BE MAINTAINED WHILE WORK IS BEING INSTALLED.
5. CONFINE DUST TO WORK AREA ONLY.
6. CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS SO THAT EQUIPMENT ON THIS APPLICATION AND ITS INSTALLATION WILL NOT AFFECT FIRE SAFETY IN THE BUILDING, EGRESS AND ENTRY TO THE BUILDING, AND STRUCTURAL SAFETY OF THE BUILDING.
7. CONTRACTOR SHALL LEAVE THE WORK SITE BROOM CLEAN EACH DAY.
8. THE FIRE PROTECTION SYSTEM MUST BE MAINTAINED IN EGRESS STAIRS, HALLWAYS AND OCCUPIED AREAS. RETURN AS MUCH OF THE EXISTING SPRINKLER SYSTEM AS POSSIBLE BACK TO OPERATING STATUS AT THE END OF EACH WORKING DAY. PROVIDE ANY REQUIRED CAPS OR TEMPORARY PIPING NECESSARY TO MAXIMIZE THE OPERABLE PORTION OF THE SPRINKLER SYSTEM. NOTIFY AND COORDINATE ANY FIRE PROTECTION SYSTEM IMPAIRMENTS WITH THE LOCAL FIRE DEPARTMENT. PROVIDE A CERTIFIED FIRE GUARD/WATCH IF REQUIRED IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION AND THE APPLICABLE BUILDING CODES.



1 TYPICAL UPRIGHT SPRINKLER HEAD CONNECTION TO EXISTING LINE PIPE DETAIL  
SCALE: NTS



2 TYPICAL BEAM CLAMP W/ RETAINING STRAP HANGER ASSEMBLY DETAIL  
SCALE: NTS

FIRE PROTECTION LEGEND

	FIRE PROTECTION PIPING	—	CAP
---	FIRE PROTECTION DRAIN PIPING	—	PLUG
⊙	CONCEALED PENDENT SPRINKLER HEAD	—	ELBOW DOWN
⊙	DRY CONCEALED PENDENT SPRINKLER HEAD	—	ELBOW UP
⊙	EXPOSED UPRIGHT SPRINKLER HEAD	—	TEE DOWN
▷	RECESSED HORIZONTAL SIDEWALL SPRINKLER HEAD	—	TEE UP
▷	DRY RECESSED HORIZONTAL SIDEWALL SPRINKLER HEAD	—	FLOW ARROW
D/EC ▷	DRY EXTENDED COVERAGE SPRINKLER HEAD	—	OS&Y VALVE W/ TAMPER SWITCH
		—	BUTTERFLY VALVE W/ TAMPER SWITCH
①	HYDRAULIC REFERENCE POINT	—	WATERFLOW SWITCH (WFS)
FP	FIRE PROTECTION	—	CHECK VALVE
SPK	SPRINKLER	▷	6" ELECTRIC BELL
NAS	NO AUTOMATIC SPRINKLERS		
FDC	FIRE DEPARTMENT CONNECTION		
AHJ	AUTHORITY HAVING JURISDICTION	ABD	AUTOMATIC BALL DRIP

GENERAL DRAWING ABBREVIATIONS

W/	WITH	W/O	WITHOUT
TYP	TYPICAL	NIC	NOT IN CONTRACT
EX	EXISTING	DN	DOWN
AHJ	AUTHORITY HAVING JURISDICTION	VIF	VERIFY IN FIELD
AFF	ABOVE FINISH FLOOR	C/L	CENTER LINE
DWG	DRAWING	UON	UNLESS OTHERWISE NOTED

DESIGN CRITERIA - SPRINKLER SYSTEM(S) - NFPA 13, 2013 ED.

1. ORDINARY HAZARD GROUP I  
MECHANICAL ROOMS, ELECTRICAL ROOMS, KITCHEN SERVICE AREAS, ETC.  
0.15 GPM/SQ. FT. FOR MOST REMOTE 1500 SQ. FT.  
130 SQ. FT. MAXIMUM COVERAGE PER SPRINKLER HEAD  
PLUS 250 GPM INSIDE/OUTSIDE HOSE
- INCLUDE ALL MODIFICATIONS TO REMOTE AREA IN ACCORDANCE WITH NFPA 13.  
-INCREASE REMOTE AREA IN HYDRAULIC CALCULATIONS 30% FOR SLOPED SYSTEMS AND 30% FOR DRY SYSTEM.
- NOTE: CONTRACTOR SHALL OBTAIN NEW "CURRENT" WATERFLOW DATA IN ACCORDANCE WITH NFPA 13, AND PROVIDE RESULTS WITH INITIAL SHOP DRAWING AND HYDRAULIC CALCULATIONS SUBMITTAL.

SPRINKLER DRAWING LIST

SP-100	-	SPRINKLER SPECIFICATIONS AND DETAILS
SP-200	-	SPRINKLER UPPER MECHANICAL ROOM CONSTRUCTION PLAN

12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY

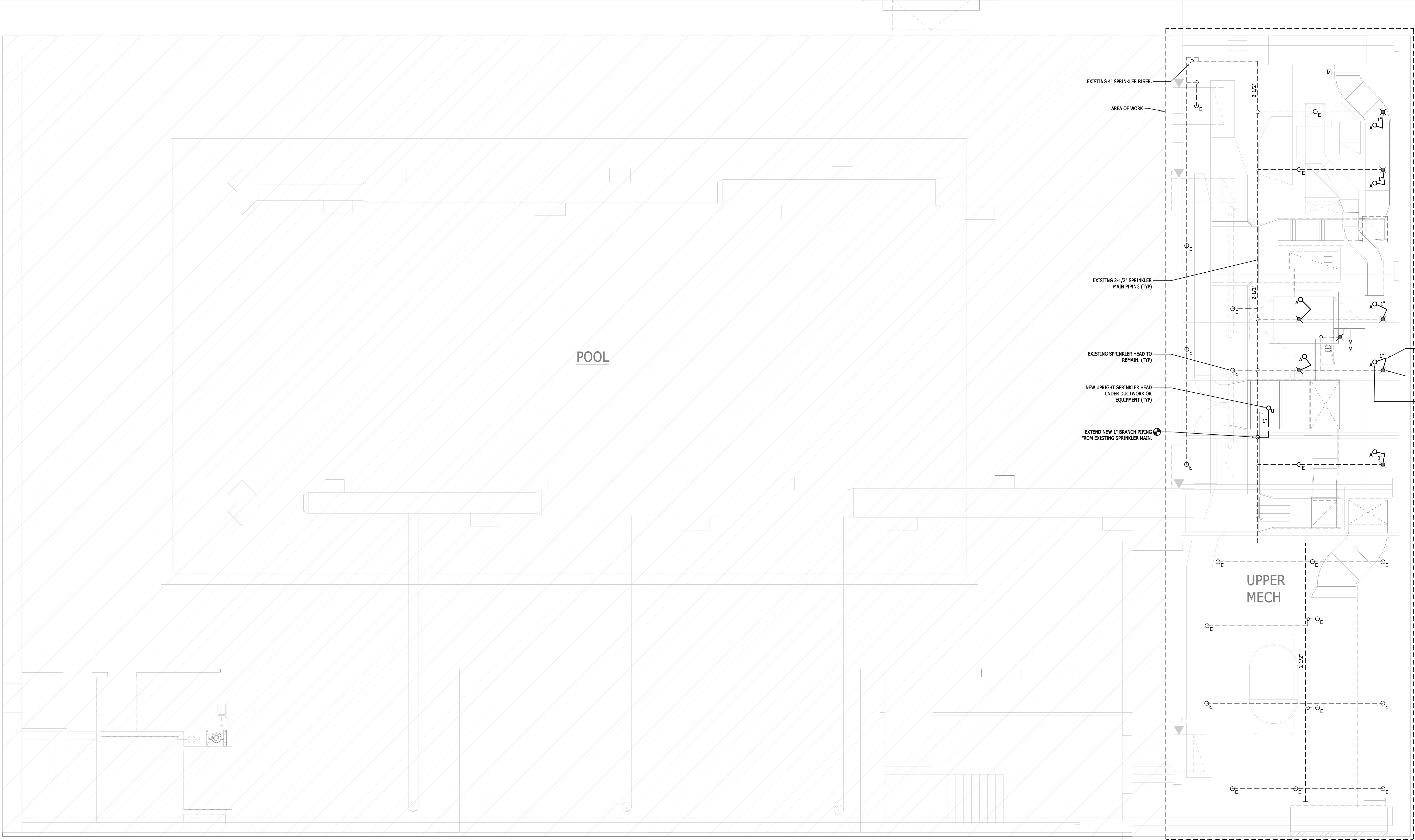
**Southport**  
Engineering Associates, PC

PROJECT: TOWN OF RIDGEFIELD  
BARLOW MOUNTAIN POOL HVAC UNIT  
RIDGEFIELD, CT 06877

DRAWING TITLE:  
SPRINKLER SPECIFICATIONS  
AND DETAILS

SCALE:	NONE	DRAWN BY:	RDS	DRAWING NO:
DATE:	11/15/22	CHECKED BY:	BU	
PROJECT NO:	414003	APPROVED BY:	BU	SP-100





**1** SPRINKLER UPPER MECHANICAL ROOM CONSTRUCTION PLAN  
SCALE: 1/4"=1'-0"

STAMP

12.16.22		ISSUED FOR BID	BU
DATE	REV	DESCRIPTION	BY
<b>Southport</b> Engineering Associates, PC 11 BAILEY AVENUE RIDGEFIELD, CT 06877 TEL: 203-431-6844 FAX: 203-431-6877			
PROJECT: TOWN OF RIDGEFIELD BARLOW MOUNTAIN POOL HVAC UNIT RIDGEFIELD, CT 06877			
DRAWING TITLE: SPRINKLER UPPER MECHANICAL ROOM CONSTRUCTION PLAN			
SCALE:	AS NOTED	DRAWN BY:	RDS
DATE:	11/15/22	CHECKED BY:	BU
PROJECT NO:	414003	APPROVED BY:	BU
			SP-200

## **SPECIAL CONDITIONS**

### **1. Contract Documents and Working Drawings:**

The work is shown on the attached appendices, if any, or the accompanying Contract Drawings. Such additional working drawings as are required because of changes or to provide greater detail will be provided by the Engineer.

### **2. Planimeter:**

The use of the planimeter shall be considered satisfactory for estimating quantities where geometric and analytic methods would be comparatively laborious.

### **3. Soil and Groundwater Conditions:**

The Town assumes no responsibility whatsoever with respect to ascertaining for the Contractor such facts concerning physical characteristics at the site of the project. The Contractor agrees that he will make no claim for and has no right to additional payment or extension of time for completion of the work, or any other concession because of any interpretations or misunderstanding on his part of this Contract, or because of any failure on his part to fully acquaint himself with all conditions relating to the work.

### **4. Existing Structures:**

All known surface structures immediately adjacent to the work, are shown on the Plans. This information is shown for the convenience of the contractor in accordance with the best information available, but is not guaranteed to be correct or complete. Underground structures in the path of the project are **not** shown. The Contractor shall explore the route ahead of trenching and shall uncover all known obstructing pipes sufficiently to determine their location. Necessary changes in location may be made by the Engineer to avoid unanticipated obstruction.

The Contractor shall, at his own expense, sustain in their places and protect from direct or indirect injury all utilities, pipes, poles, conduits, walls, buildings, and other structures, utilities, and property in the vicinity of his work. Such sustaining and protecting shall be done carefully by the Contractor and as required by the party owning or controlling the structure. Before proceeding with such work, the Contractor shall satisfy the Engineer that the methods and procedures to be used have been approved by the party owning said structure. The Contractor shall take all risks attending the presence or proximity of pipes, poles, conduits, walls, buildings, wires, or other structures, utilities, and property in the vicinity of his work, and he shall be responsible for all damage and assume all expense for direct or indirect injury caused by his work to any of them or to any person or property by reason of injury to them.

**The Contractor must notify “Call Before You Dig” at 1-800-922-4455 prior to start of construction.**

**5. Dust Control:**

The Contractor shall take all necessary precautions to prevent and abate nuisance caused by dust arising from his operation, by the application of water spray.

**6. Sedimentation and Erosion Control:**

The Contractor shall control sedimentation and erosion in accordance with the publication entitled, “Erosion and Sedimentation Control Handbook,” latest edition, U. S. Department of Agriculture, Soil Conservation Service, Storrs, Connecticut, and as approved by the Engineer.

**7. Payment for Miscellaneous Work:**

No direct or separate payment will be made for furnishing and providing miscellaneous temporary works, plant and services, including Contractor’s office, sanitary requirements, water supply, power, tools, equipment, lighting, telephone systems, store houses, store yards, safety devices, and watchmen, or other items specified under these special conditions. Compensation for all such services and materials shall be considered as having been included in the prices stipulated for the Items of the Contract.

**8. Clean-up of Site:**

During the progress of the work, the Contractor shall keep the site in a generally neat condition. Lunch papers, bottles, lumber cut-offs, drinking cups, and like rubbish shall be removed from the site daily. The work shall be cleaned up as the various portions of the project are completed.

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall, except as otherwise expressly directed or permitted in writing, clean and remove from the site all surplus and discarded materials, rubbish, and temporary structures. He shall restore in an acceptable manner all property, both public and private, which has been damaged during the prosecution of the work, and leave the whole in a neat and presentable condition. He shall also remove all plant, surplus, and waste materials from the site.

**9. Emergency Work:**

The Contractor shall file with the Engineer a telephone number of a person authorized by him who may be contacted regarding emergency work at the job site that may be required during non-working hours for reasons of public safety. The person shall be readily available and have full authority to deal with any emergency that may occur.

**10. Work in Bad Weather:**

During freezing, stormy, or inclement weather, no work shall be done except that which can be done satisfactory and in a manner as to secure first-class construction throughout.

**11. Night, Saturday, and Sunday Work:**

Unless otherwise permitted or stipulated under a State or Town encroachment permit, no work shall be done between the hours of 6:00 p.m. and 7:00 am, nor on Saturday or Sunday, except as necessary for the proper care and protection of the work already performed. If it shall become absolutely necessary to perform work at night or on Saturday or Sunday, the Engineer shall be informed at least twenty-four (24) hours in advance of the beginning of performance or such work. Only such work shall be done at night as can be done satisfactorily and in a first-class manner. Good light and other necessary facilities for performing and inspecting the work shall be provided and maintained at all points where such work is being done.

**12. Explosives and Blasting:**

Explosives for blasting shall be stored, handled, and used in accordance with the laws, ordinances, and regulations of the State of Connecticut, all local regulations, and with such additional regulations as the Engineer may require. Blasting shall be conducted so as not to endanger persons or property and, unless otherwise permitted, shall be covered or otherwise satisfactorily confined. The Contractor shall be responsible and shall make good any damage of whatever nature caused by blasting or accidental explosions. It shall be the Contractor's responsibility to obtain all required permits for blasting.

**13. Traffic Control:**

The Contractor shall maintain traffic during the progress of the work. Barricades, flagmen, uniformed police officers on any other type of traffic control necessary to ensure the safety of the public shall be utilized by the Contractor. All methods of traffic control are subject to the approval of the Chief of Police who may direct other methods to be employed. No direct payment for traffic control will be made other than payment for uniformed police officers **at cost** and only when directed by the Chief of Police or as required as a condition of approval by the State or Town encroachment permit. It is the Contractor's responsibility to schedule all uniformed police officers as may be required. Payment for all traffic control other than uniformed police officers shall be covered under the various items of these specifications.

**14. Material Disposal:**

The Contractor shall be responsible for the disposal of all construction debris generated by the project. The Town cannot accept the disposal of any material at this time.

**17. Wage Rates:**

This project **IS** subject to prevailing wage rates.

**18. Permits:**

It is the Contractor's responsibility to obtain all necessary building or construction permits, including those that may be required from either the Town of Ridgefield or the State of Connecticut, prior to the start of construction. All work shall be completed in compliance with the latest edition of the prevailing fire prevention and building codes in effect in the State of Connecticut or the State of Connecticut department of Transportation Standard Specifications, latest edition, as applicable.

**19. Concrete Testing:**

Concrete testing **IS** required.

**20. Materials:**

Materials normally delivered labeled shall be received with manufacturer's original label and instruction, or else shall be subject to rejection. Materials shall be stored under adequately clean and dry condition, and all work shall be preformed according to the best practice of the trades. Manufacturer's specifications and instructions for products specified herein or approved equals, become part of these specifications and all such instructions are to be followed accordingly.

**21. Lines and Grades:**

It is the intent of these plans and specifications to illustrate the approximate location of the proposed sidewalk. It is the Contractor's responsibility to locate in the field the project's location according to the constraints as shown on the plans or listed under these specifications.

**22. Accommodation of Traffic:**

During the progress of the work, all roads shall be kept open for the passage of traffic and pedestrians and shall not be unnecessarily obstructed unless authorized by the authority having jurisdiction over same. Driveways, sidewalks and crossings shall be closed as short a time as possible while pipe is being placed, and passage shall be restored as soon as possible thereafter by properly placed backfill or approved bridging. The Contractor shall take such measures at his own expense as may be necessary to keep the roads open for traffic, and shall give advance notice to the Department of Transportation (D.O.T.), town public works department, local police and state police as required.

Warning signs shall be provided along all roads where work is in progress. The Contractor shall notify and make all arrangements with the D.O.T., town public works department, local police and state police for direction of traffic past the equipment, machinery, or construction operations. Barricades and lights shall be provided to protect traffic. Where trenches have been cut in road shoulders on which traffic may pass at times, warning signs shall be placed at frequent intervals and maintained until the shoulder is safe for travel. All such work and operations shall be in accordance with the requirements of the D.O.T., public works department, local police and state police.

Should the Contractor or his employees neglect to set out and maintain barricades or lights, as required in these Specifications, the Engineer may immediately and without notice, arrange for furnishing, installing and maintaining barricades or lights, and any other precaution deemed necessary. The cost thereof shall be borne by the Contractor and may be deducted from any amount due or to become due to the Contractor under this Contract.

The Contractor shall be held responsible for any damages that may have to be paid as a consequence of the Contractor's failure to protect the public.

All policies relating to this Contract shall be so written so that the Town shall be notified of cancellation or change at least thirty (30) days prior to the effective date for each policy and type of coverage except for nonpayment which shall be ten (10) days prior to the cancellation. Renewal certificate covering the renewal of all policies expiring during the life of the Contract shall be filed with the Town not less than ten (10) days before the expiration of such policies. Failure to do so will result in work stoppage and possible contract cancellation.



**ID#:** 22-42958

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Town: Ridgefield  
FAP#:

1b) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. \*\*See Laborers Group 7\*\*

**As of:** December 15, 2022

4) Group 1: Laborers (common or general), acetylene burners, concrete specialists, wrecking laborers, fire watchers.	32.0	24.40
4a) Group 2: Mortar mixers, plaster tender, power buggy operators, powdermen, fireproofers/mixer/nozzleman (Person running mixer and spraying fireproof only).	32.25	24.40
4b) Group 3: Jackhammer operators/pavement breaker, mason tender (brick), mason tender (cement/concrete), forklift operators and forklift operators (masonry).	32.5	24.40
4c) **Group 4: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license) (the pipelayer rate shall apply only to one or two employees of the total crew who primary task is to actually perform the mating of pipe sections) P6 and P7 rate is \$26.80.	33.0	24.40
4d) Group 5: Air track operator, sand blaster and hydraulic drills.	32.75	24.40
4e) Group 6: Blasters, nuclear and toxic waste removal.	35.0	24.40
4f) Group 7: Asbestos/lead removal and encapsulation (except it's removal from mechanical systems which are not to be scrapped).	33.0	24.40
4g) Group 8: Bottom men on open air caisson, cylindrical work and boring crew.	30.28	24.40
4h) Group 9: Top men on open air caisson, cylindrical work and boring crew.	29.74	24.40
4i) Group 10: Traffic Control Signalman	18.0	24.40
5) Carpenter, Acoustical Ceiling Installation, Soft Floor/Carpet Laying, Metal Stud Installation, Form Work and Scaffold Building, Drywall Hanging, Modular-Furniture Systems Installers, Lathers, Piledrivers, Resilient Floor Layers.	36.07	26.15

**As of:** December 15, 2022

5a) Millwrights	36.32	26.81
6) Electrical Worker (including low voltage wiring) (Trade License required: E1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	41.4	31.07+3% of gross wage
7a) Elevator Mechanic (Trade License required: R-1,2,5,6)	58.9	36.885+a+b
-----LINE CONSTRUCTION-----		
Groundman	26.5	6.5% + 9.00
Linemen/Cable Splicer	48.19	6.5% + 22.00
8) Glazier (Trade License required: FG-1,2)	40.78	23.40 + a
9) Ironworker, Ornamental, Reinforcing, Structural, and Precast Concrete Erection	39.7	38.77 + a
-----OPERATORS-----		
Group 1: Crane Handling or Erecting Structural Steel or Stone; Hoisting Engineer (2 drums or over). (Trade License Required)	50.27	26.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and Over	46.07	26.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	49.91	26.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	49.06	26.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer)	45.71	26.80 + a

**As of:** December 15, 2022

Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Finegrade. (slopes, shaping, laser or GPS, etc.). (Trade License Required)	44.86	26.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper); Goldhofer.	44.42	26.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Spreader, Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24 mandrel).	43.73	26.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	43.73	26.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	43.38	26.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under mandrel).	42.99	26.80 + a
Group 8: Mechanic; Grease Truck Operator; Hydroblaster; Barrier Mover; Power Stone Spreader; Welding; Work Boat Under 26 ft.; Transfer Machine; Rigger Foreman.	42.54	26.80 + a
Group 9: Front End Loader (under 3 cubic yards); Skid Steer Loader regardless of attachments; (Bobcat or Similar); Forklift, Power Chipper; Landscape Equipment (including Hydroseeder); Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	42.04	26.80 + a
Group 10: Vibratory hammer; ice machine; diesel and air, hammer, etc.	39.7	26.80 + a
Group 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.	39.7	26.80 + a

**As of:** December 15, 2022

Group 12: Wellpoint Operator.	39.63	26.80 + a
Group 13: Compressor Battery Operator.	38.97	26.80 + a
Group 14: Elevator Operator; Tow Motor Operator (solid tire no rough terrain).	37.66	26.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	37.2	26.80 + a
Group 16: Maintenance Engineer.	36.46	26.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator; Portable Grout Plant Operator; Portable Water Filtration Plant Operator.	41.39	26.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (Minimum for any job requiring a CDL license); Rigger; Signalman.	38.61	26.80 + a
-----PAINTERS (Including Drywall Finishing)-----		
10a) Brush and Roller	37.22	23.40
10b) Taping Only/Drywall Finishing	37.97	23.40
10c) Paperhanger and Red Label	37.72	23.40
10e) Blast and Spray	40.22	23.40
11) Plumber (excluding HVAC pipe installation) (Trade License required: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2)	47.03	34.05
12) Well Digger, Pile Testing Machine	37.26	24.05 + a

**As of:** December 15, 2022

Roofer: Cole Tar Pitch	43.0	21.80 + a
Roofer: Slate, Tile, Composition, Shingles, Singly Ply and Damp/Waterproofing	41.5	21.80 + a
15) Sheetmetal Worker (Trade License required for HVAC and Ductwork: SM-1,SM-2,SM-3,SM-4,SM-5,SM-6)	48.77	45.20
16) Pipefitter (Including HVAC work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4, G-1, G-2, G-8 & G-9)	47.03	34.05
-----TRUCK DRIVERS-----		
17a) 2 Axle, Helpers	31.16	28.78 + a
17b) 3 Axle, 2 Axle Ready Mix	31.27	28.78 + a
17c) 3 Axle Ready Mix	31.33	28.78 + a
17d) 4 Axle	31.39	28.78 + a
17e) 4 Axle Ready Mix	31.44	28.78 + a
17f) Heavy Duty Trailer (40 Tons and Over)	33.66	28.78 + a
17g) Specialized Earth Moving Equipment (Other Than Conventional Type on-the-Road Trucks and Semi-Trailers, Including Euclids)	31.44	28.78 + a
17h) Heavy Duty Trailer up to 40 tons	32.39	28.78 + a

**As of:** December 15, 2022

17i) Snorkle Truck	31.54	28.78 + a
18) Sprinkler Fitter (Trade License required: F-1,2,3,4)	47.55	28.96 + a
19) Theatrical Stage Journeyman	25.76	7.34

*Welders: Rate for craft to which welding is incidental.*

*\*Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

*\*\*Note: Hazardous waste premium \$3.00 per hour over classified rate*

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

*The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.*

*Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.*

*It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.*

*The annual adjustments will be posted on the Department of Labor's Web page:*

*www.ct.gov/dol. For those without internet access, please contact the division listed below.*

*The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.*

*All subsequent annual adjustments will be posted on our Web Site for contractor access.*

*Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.*

*Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage*

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

**~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).**

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

**As of:** December 15, 2022

**As of:** December 15, 2022