


Request for Bids	 Marshall University Office of Purchasing One John Marshall Drive Huntington, WV 25755-4100 Direct all inquiries regarding this order to: (304) 696-2822	Bid # R1901405
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Vendor:	Phone:	For information contact:
	Fax:	Purchasing Contact: Harold R. Sanders
		Email: sanders13@marshall.edu
		& purchasing@marshall.edu
		Phone: (304) 696-2822
FEIN/SSN:		

Sealed requests to bid for furnishing the supplies, equipment or services described below will be received by the Institution. TO RECEIVE CONSIDERATION FOR AWARD, UNLESS OTHERWISE NOTED, THE BID WILL BE SUBMITTED ON THIS FORM IN ORIGINAL AND (1) COPY, SIGNED IN FULL IN INK, AND RECEIVED IN THE OFFICE OF PURCHASING TO HAVE A DATE/TIME STAMP AFFIXED, ON OR BEFORE THE DATE AND TIME SHOWN FOR THE BID OPENING. When applicable, prices will be based on units specified; and Bidders will enter the delivery date or time for items contained herein. The Institution reserves the right to accept or reject bids on each item separately or as a whole, to reject any or all bids, to waive informalities or irregularities and to contract as the best interests of the Institution may require. BIDS ARE SUBJECT TO THE GENERAL TERMS AND CONDITIONS AS SET FORTH HEREIN.

DATE 02/05/2019	DELIVERY IS REQUIRED NO LATER THAN February 12, 2019	DEPARTMENT REQUISITION NO. R1901405	BIDS OPEN: 3:00 p.m. on 02/12/19	BIDDER MUST ENTER DELIVERY DATE FOR EACH ITEM BID
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Item #	Quantity	Description	Unit Price	Extended Price
		<u>Addendum #1</u>		
		Project: School of Medicine Boiler and Chiller Replacement Date: February 12, 2019 Time: 3:00pm The purpose of this addendum is to modify and/or clarify project requirements, specifications, and drawings as per the attached information prepared by Scheeser, Buckley, Mayfield. The updated information must be taken into account in preparing proposals and shall become a part of the final contract documents. Receipt of this addendum must be acknowledged in the space provided on this front page and within this addendum, see page 7.		

Total

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To the Office of Purchasing,
 In compliance with the above, the undersigned offers and agrees, if this offer is accepted within _____ calendar days (30 calendar days unless a different period is inserted by the purchaser) from the bid open date, specified above, to furnish any or all items upon which prices are offered, at the price set opposite each item, delivered at the designated point(s), within the time specified.

Bidder guarantees shipment from _____
 _____ within _____ days
 FOB _____
 Terms _____
 After receipt of order at address shown

Bidder's name Vendor _____
 Signed By _____
 Typed Name _____
 Title _____
 Street Address _____
 City/State/Zip _____
 Date _____ Phone _____

MUSOM

Boiler and Chiller Replacement

1340 Hal Greer Boulevard
Huntington, WV 25701

ADDENDUM NO. 1

February 5, 2019

TO ALL BIDDERS:

This Addendum supplements and amends the original Plans and Specifications and shall be taken into account in preparing proposals and shall become a part of the contract documents.

Pre-bid meeting was held at the site on Tuesday, January 29, 2019 @ 10:00 AM. The questions were asked at the pre-bid meeting and/or subsequent the meeting and answers have been provided as part of this addendum. A copy of the sign-in sheet has also been included: The following items are to be incorporated in to Addendum No. 1.

ITEM 1 Modifications to construction schedule

Start date for chiller installation: September 30th, 2019
Substantial completion with operational chiller: November 8th, 2019
Project final completion: December 6, 2019

ITEM 2 All downtime for boiler and/or chiller replacement to take place on weekend and be performed in one day. At the completion of the day all systems to be fully operational. All shutdowns to be coordinated with owner.

ITEM 3 Question; Existing chiller has flexible connection. Will flex connections be required for new installation?

Flex connections will be required.

Flexible Pipe Connectors: Provide type 304 stainless steel corrugated bellows with control rods and 150 psig ANSI steel flanges. Expansion element shall be joined to flanges by flaring over face or by welding to the flange bore. The entire unit shall be rated for 150 psig working pressure at 800 deg F working temperature.

ITEM 4 Question; I assume all demo'd items become the property of the contractor:

In accordance with specification section 230505, "Basic HVAC Material and Methods"; All equipment removed shall be offered to the Owner for his retention. If the Owner elects to retain equipment, it shall be turned over to the Owner at the site. If not, the equipment shall be removed from the premises by this Contractor.



- ITEM 5 Question; Will any alternate manufacturers be allowed to submit a price for the chiller, or is it flat specified Daikin?
- The only acceptable chillers are those listed in the specifications and on the drawings.
- ITEM 6 Question; Who has the existing controls for the building?
- Johnson Controls are the existing controls in the building and no other controls manufacturers are acceptable.
- ITEM 7 Question; Is there a sectional detail available of the louver to be removed? In particular the blanked off area showing what materials were used to get to the finished surface.
- Restore the blanked off portion of the louver to pre-construction condition.
- ITEM 8 Question; Does the owner want to retain position of the refrigerant in the chiller to be removed?
- The owner does not want to retain the refrigerant.
- ITEM 9 Question; The two pads under the auxiliary chiller barrel to be removed, are they to remain or be removed also.
- These pads are to be removed.
- ITEM 10 Sheet M1, "General Notes, Symbol Legend, Details and Schedules"
- Refer to attached sheet M1 for removal of "In-Line Pump Installation Detail".
 - Refer to attached sheet M1 for addition of "End Suction Water Pump Isometric".
 - Refer to attached sheet M1 for removal of "Hydronic Pump Schedule".
 - Refer to attached sheet M1 for removal of "Buffer Tank Schedule".
- ITEM 11 Sheet MD1, "Demolition – Floor Plan – HVAC (Piping)";
- Refer to attached sheet MD1 for modifications to removal of heating water piping.
 - Refer to attached sheet MD1 for removal of storage tank along chiller being removed.
- ITEM 12 Sheet M3, "New Work – Floor Plan – HVAC (Piping)";
- Refer to attached sheet M3 for modifications to heating water piping and equipment.
 - Refer to attached sheet M3 for addition of tower water pump, CP-3 and associated tower water piping.
 - Refer to attached sheet M3 for modification of tower water bypass.
 - Refer to attached sheet M3 for tower water cross connect piping to be installed under add alternate.
- ITEM 13 Sheet M4 "Demo/New Work – Flow Diagrams & Temperature Controls";
- Refer to attached sheet M4 for modifications to heating water system flow diagrams.
 - Refer to attached sheet M4 for addition of tower water pump, CP-3 control diagram.
 - Refer to attached sheet M4 for modification of tower water bypass.



- Refer to attached sheet M4 for addition of general note in reference to controls manufacturer and devices.

ITEM 14 Specification section 012300 "Alternates";

- Refer to attached specification section for addition of Alternate No 3. for inclusion of tower water cross connects.

ITEM 15 Form of Proposal

- Refer to attached Form of Proposal for addition of Addendum No. 3.

ITEM 16 Sheet E1 "Notes, Legends, Details – Electrical"

- Refer to attached revised sheet E1 for modifications to remove BP-1 & BP-2 and add CP-3.
- Mechanical Equipment Schedule shows the feeder for CH-1 as 450B and CH-1A as 500B. These are feeder size designations per the Standard Feeder Schedule also on Drawing E1.
- Coded Note 6 shows the feeder for CH-1 as 450A and CH-1A as 500C. 450 A and 500 A are fuse sizes in Amps NOT feeder sizes. Codes note 6 is referencing the change in fuse sized required by the change in chiller under Alternate.

ITEM 17 Sheet E3 "Power- Floor Plan – Electrical"

- Refer to attached revised sheet E3 for modifications to remove BP-1 & BP-2 and add CP-3.

Attachments: Sheets: MD-1, M1, M3, M4, E1, E3 Specification Section 012300, Form of Proposal
Pre-bid Sign-in Sheet

END OF ADDENDUM

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MUSOM BOILER AND CHILLER REPLACEMENT

FORM OF PROPOSAL

TO THE OWNER: Marshall University, on behalf of the Governing Board
One John Marshall Drive
Huntington, WV 25755

PROJECT: Requisition No.: R1901405
MUSOM
Chiller and Boiler Replacement

The undersigned, hereinafter called the Bidder, being familiar with and understanding the Bidding Documents and also having examined the site and being familiar with all local conditions affecting the Project hereby proposes to furnish all labor, material, equipment, supplies, allowances and transportation, and to perform all Work in accordance with the Bidding Documents within the time noted in specification Section 01010 - Summary Of Work

BASE BID:

- 1. All below work to be completed in the specified time frame.
2. All work needed for a complete installation.

BASE BID: \$ (Amount to be shown in both words and numbers. In the event of a difference between the written and the number amount, the written amounts shall prevail)

ADD ALTERNATE NO. 1: Chiller type to be centrifugal VFD type.

- 1. All below work to be completed in the specified time frame.
2. All work needed for a complete installation.

ADD ALTERNATE NO. 1: \$ (Amount to be shown in both words and numbers. In the event of a difference between the written and the number amount, the written amounts shall prevail)

RESPECTFULLY SUBMITTED:

SIGNATURE: DATE: Signature In Ink

NAME: Please Type or Print

TITLE: Corporate Seal if Applicable

FIRM NAME:

FIRM ADDRESS:

MUSOM BOILER AND CHILLER REPLACEMENT

TELEPHONE: _____

ADD ALTERNATE NO. 2: Removal and replacement of existing boiler. Demolition of existing heating water supply and return piping. Installation of new heating water supply and return piping, installation of new boiler circulating pumps and buffer tank.

- 1. All below work to be completed in the specified time frame.
- 2. All work needed for a complete installation.

ADD ALTERNATE NO. 2: _____ \$ _____ (Amount to be shown in both words and numbers. In the event of a difference between the written and the number amount, the written amounts shall prevail)

RESPECTFULLY SUBMITTED:

SIGNATURE: _____ DATE: _____
Signature In Ink

NAME: _____
Please Type or Print

TITLE: _____
Corporate Seal if Applicable

FIRM NAME: _____

FIRM ADDRESS: _____

TELEPHONE: _____

ADD ALTERNATE NO. 3: Installation of tower water cross connections and associated valving.

- 1. All below work to be completed in the specified time frame.
- 2. All work needed for a complete installation.

ADD ALTERNATE NO. 3: _____ \$ _____ (Amount to be shown in both words and numbers. In the event of a difference between the written and the number amount, the written amounts shall prevail)

RESPECTFULLY SUBMITTED:

SIGNATURE: _____ DATE: _____
Signature In Ink

NAME: _____
Please Type or Print

TITLE: _____
Corporate Seal if Applicable

MUSOM BOILER AND CHILLER REPLACEMENT

FIRM NAME: _____

FIRM ADDRESS: _____

TELEPHONE: _____

ADDENDA ACKNOWLEDGEMENT

The undersigned hereby acknowledges receipt of the following Addenda and has taken the information contained therein into full consideration in the formulation of this Bid.

- Addenda No. 1 _____
- No. 2 _____
- No. 3 _____
- No. 4 _____
- No. 5 _____

Failure to acknowledge receipt of each Addendum may be cause for rejection of the Bid.

SIGNATURE: _____ DATE: _____
Signature in Ink

CONTRACTORS LICENSE

West Virginia Code 21-11-2 requires that all persons desiring to perform contractual work in West Virginia must be duly licensed. The West Virginia Contractors Licensing Board is empowered to issue the contractor's license. Application for a contractor's license may be made by contacting the West Virginia Department of Labor, 1800 Washington Street, East, Charleston, West Virginia 25305. Telephone: (304) 348-7890. West Virginia Code 21-11-11 requires any prospective Bidder to include the contractor's license number on their Bid. The successful Bidder will be required to furnish a copy of their contractor's license prior to issuance of a Purchase Order/Contract. Please complete **EXHIBIT A** and attach to form of proposal.

WEST VIRGINIA FAIRNESS IN COMPETITIVE BIDDING ACT

Found in Chapter 5 Article 22 (§5-22-1) of the West Virginia Code is the requirement for the apparent low bidder on projects exceeding \$250,000 to provide a list of all subcontractors who will perform more than

MUSOM BOILER AND CHILLER REPLACEMENT

\$25,000 of work on the project, including labor and materials (provisions apply and may be found in the complete article). If no subcontractors are to be used to complete the project it will be so noted on the subcontractor list Please complete **EXHIBIT B** as noted below.

This information shall be provided to the Marshall University Office of Purchasing within one business day of the opening of bids for review prior to the award of a construction contract. Failure to submit the subcontractor list within one business day after the deadline for submitting bids shall result in disqualification of the bid.

**EXHIBIT A
CONTRACTORS LICENSE**

West Virginia Code 21-11-2 requires that all persons desiring to perform contractual work in West Virginia must be duly licensed. The West Virginia Contractors Licensing Board is empowered to issue the contractor's license. Application for a contractor's license may be made by contacting the West Virginia Department of Labor, 1800 Washington Street, East, Charleston, West Virginia 25305. Telephone: (304) 348-7890. West Virginia Code 21-11-11 requires any prospective Bidder to include the contractor's license number on their Bid. The successful Bidder will be required to furnish a copy of their contractor's license prior to issuance of a Purchase Order/Contract. Please complete and attach to form of proposal.

CONTRACTOR NAME _____

CONTRACTOR'S LICENSE No.: _____

EXHIBIT B

LIST OF PROPOSED SUBCONTRACTORS, EQUIPMENT / MATERIAL SUPPLIERS

This document is to be submitted by the apparent low bidder within 24 hours of bid date and time. It does not need to be submitted with bid.

List as designated below each subcontractor / supplier for this proposal who will perform more than \$25,000 of work on the project. Also provide contractor's license number for each subcontractor as required by "West Virginia Contractor Licensing Act" and FEIN number as required by "West Virginia Fairness in Competitive Bidding Act".

If the branch of work is to be completed solely by Contractor, so indicate. If acceptance of an alternate proposal changes a subcontractor or equipment or material supplier, indicate by notation below. Contractor is responsible for selecting or changing subcontractors and/or equipment or material suppliers. Owner and Architect/Engineer may indicate their concerns about any entity listed which they have reason to believe past experience indicates poor performance may be expected. Bidder may be requested to change an unsatisfactory subcontractor or equipment or material supplier. Contractor has full responsibility for satisfactory execution of all work in accordance with Contract Documents. Any change of proposed subcontractors or material suppliers shall be at no additional cost to Owner, as Contractor has full responsibility for execution of the work.

Subcontractor / Supplier Name	Contractor License #	FEIN#
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- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____
- 13. _____
- 14. _____
- 15. _____

(Use Additional Pages as Required)

END OF FORM OF PROPOSAL

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.03 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.04 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

MUSOM BOILER AND CHILLER REPLACEMENT

PART 3 - EXECUTION

3.01 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Chiller type to be centrifugal VFD type.
- B. Alternate No. 2: Removal and replacement of existing boiler. Demolition of existing heating water supply and return piping. Installation of new heating water supply and return piping, installation of new boiler circulating pumps and buffer tank.
- C. Alternate No. 3: Installation of tower water cross connections and associated valving.

END OF SECTION

TOWER WATER CROSS CONNECT VALVE SEQUENCING									
SCENARIO	VALVE IDENTIFICATION								
	1	2	3	4	5	6	7	8	9
TWP-1, CH-1, T-1	C	0	-	C	-	0	C	-	0
TWP-1, CH-2, T-1	0	C	0	0	C	0	C	-	0
TWP-1, CH-2, T-2	0	C	0	C	0	-	0	C	0
TWP-2, CH-1, T-1	0	0	C	0	0	0	C	0	-
TWP-2, CH-1, T-2	0	0	C	C	0	-	0	0	C

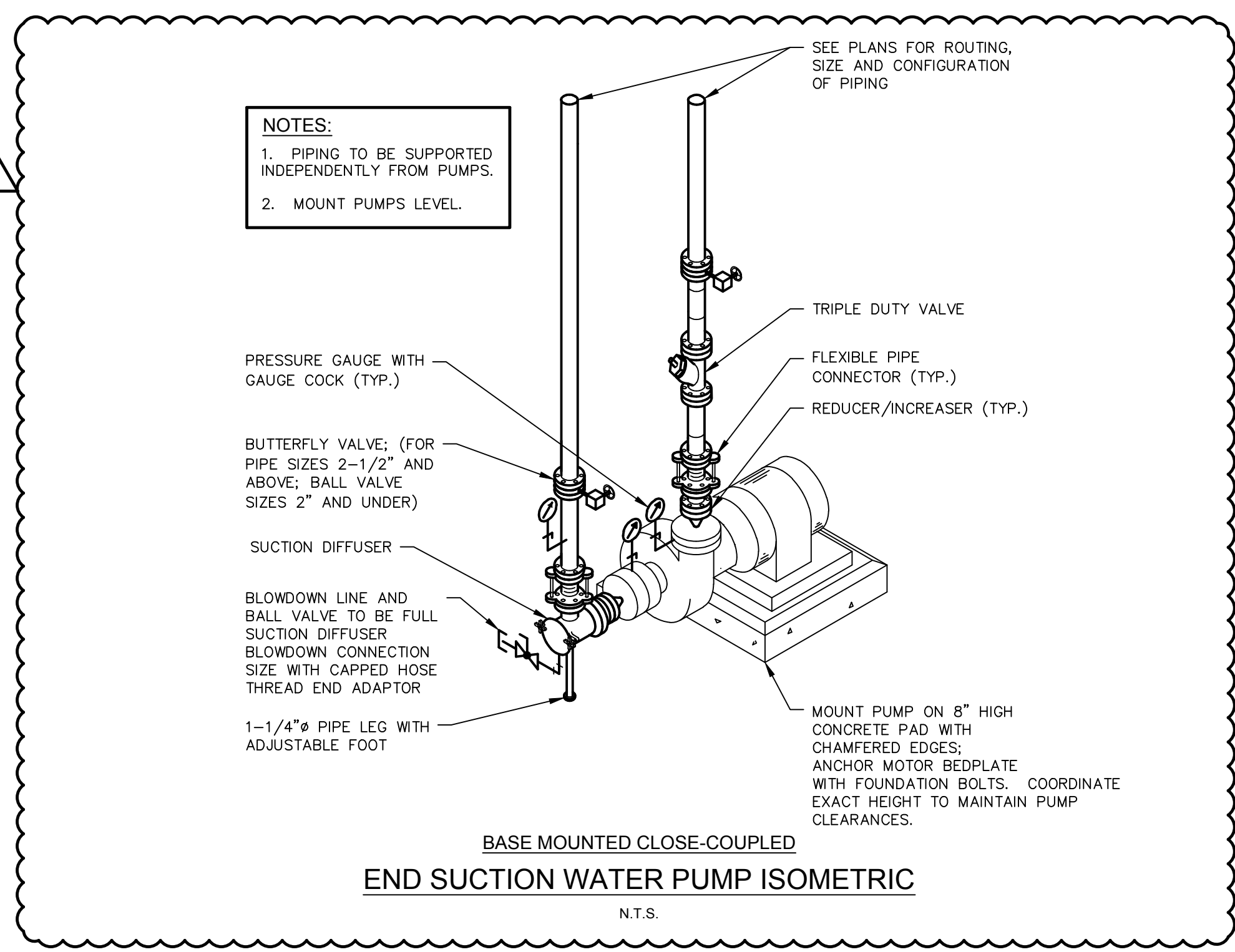
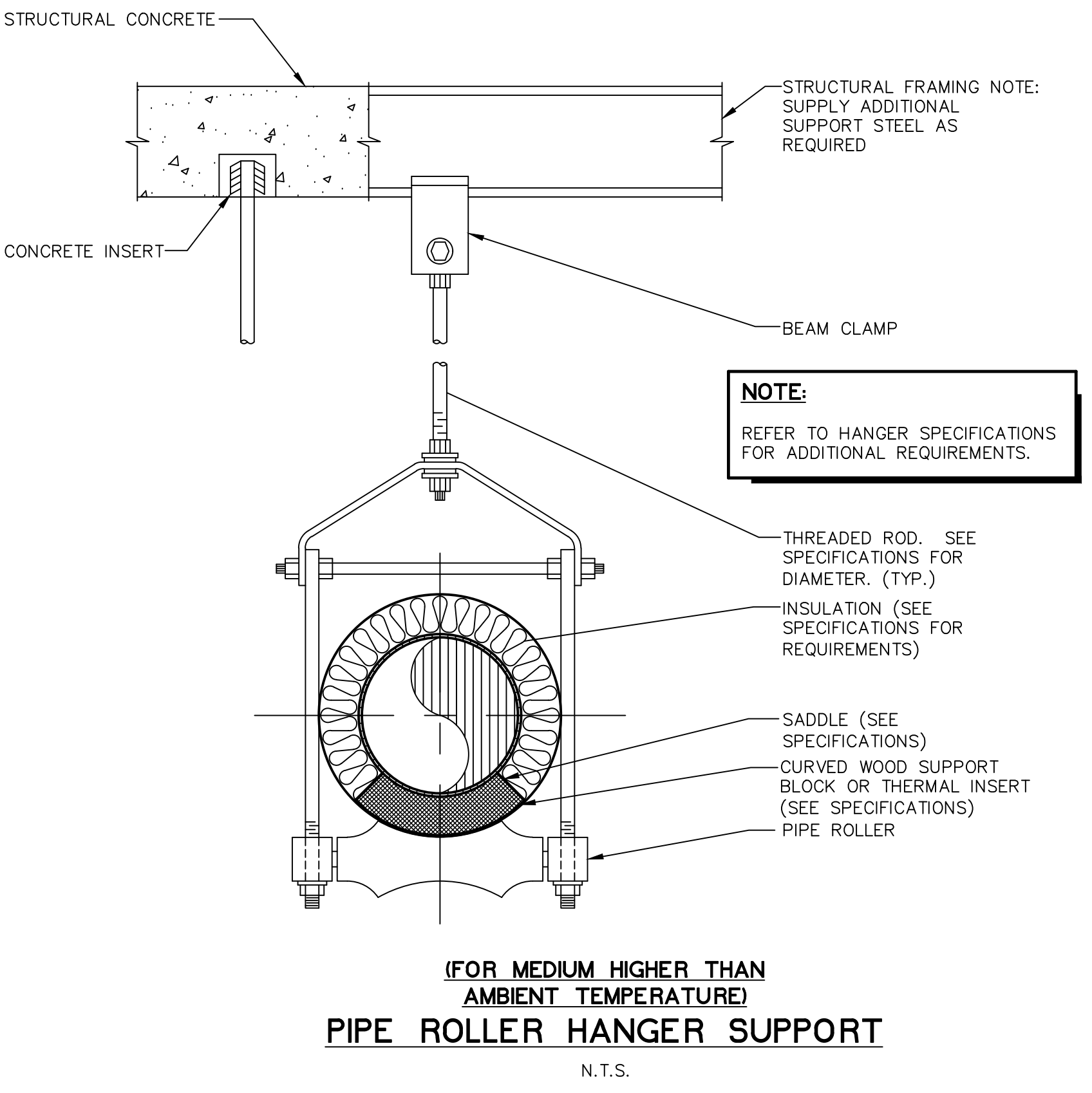
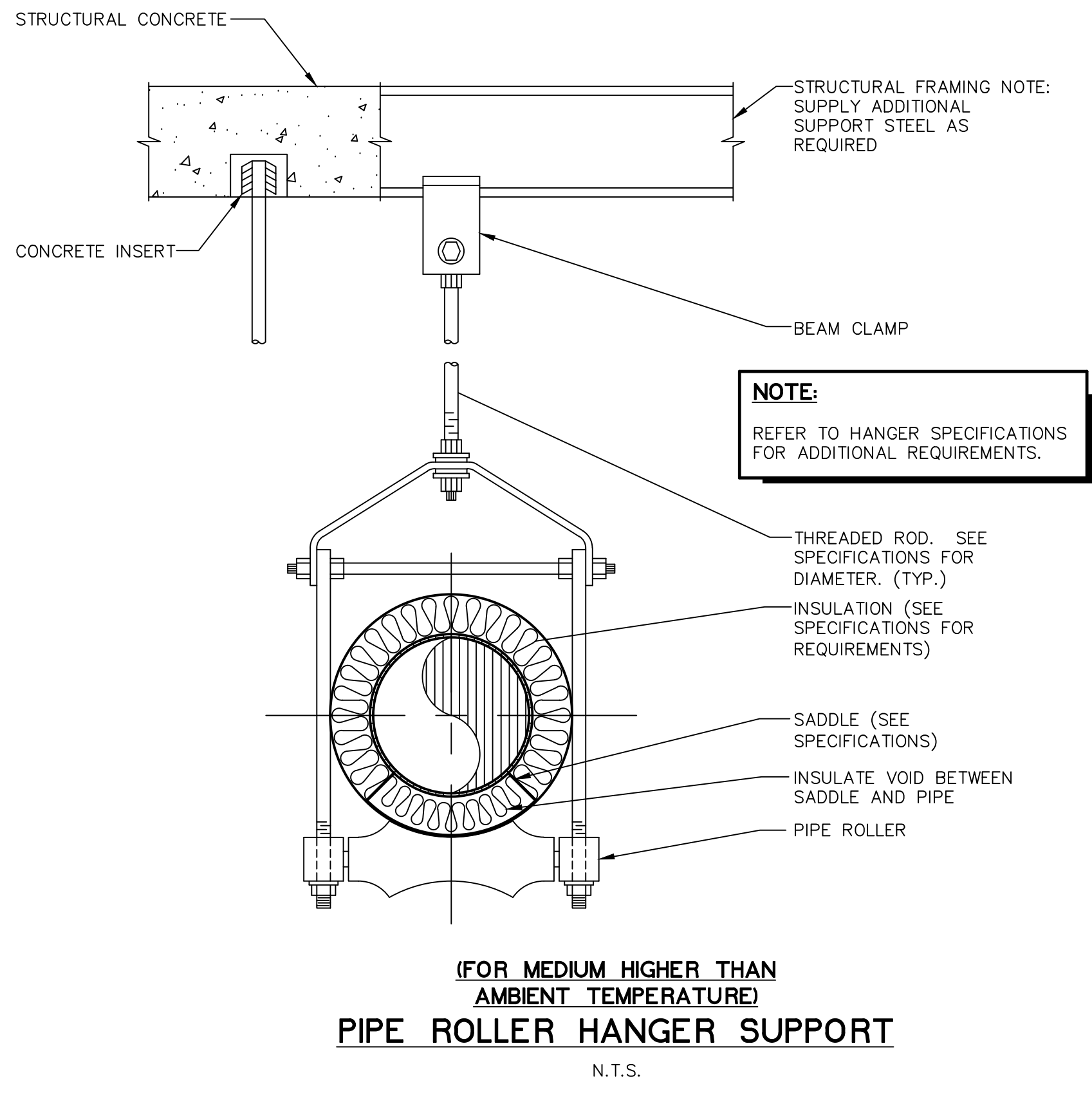
SCENARIO'S LISTED INDICATED EQUIPMENT IN OPERATION VALUES AT NON-OPERATING PUMP TO BE CLOSED IN CROSS CONNECTING SCENARIO.

- ### HVAC NEW WORK GENERAL NOTES
- THE GENERAL NOTES LISTED HERE APPLY TO ALL HVAC DRAWINGS IN ADDITION TO ANY ADDITIONAL DRAWING NOTES ON THE INDIVIDUAL DRAWINGS.
 - REFER ALSO TO DUCTWORK MATERIAL SCHEDULE AND NOTES FOR ADDITIONAL GENERAL NOTES APPLICABLE TO DUCTWORK.
 - SEE CODED NOTES ON INDIVIDUAL DRAWING SHEETS FOR SPECIFIC INSTRUCTIONAL NOTES.
 - FIELD VERIFY EXISTING CONDITIONS.
 - COORDINATE WITH GENERAL TRADES WORK, PLUMBING WORK, FIRE PROTECTION WORK, ELECTRICAL WORK AND OTHER WORK.
 - IT IS RECOGNIZED THAT DRAWINGS MAY BE PLOTTED AT DIFFERENT SCALES, SUCH THAT PLOTTED DRAWINGS MAY VARY FROM ACTUAL OR INTENDED DIMENSIONS. THEREFORE, DRAWINGS ARE DIAGRAMMATIC AND ARE NOT TO BE SCALED. SBM TAKES NO RESPONSIBILITY FOR ERRORS REGARDING DISCREPANCIES FROM THE ORIGINAL DRAWINGS DRAWN AT THE PROPER SCALE AND THOSE DRAWINGS THAT HAVE BEEN PLOTTED.
 - THE MECHANICAL DESIGN DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATION OF EQUIPMENT, PIPING AND DUCTWORK UNLESS DIMENSIONS ARE GIVEN OR OTHERWISE IMPLIED FOR CLEARANCES, ETC. PIPING, DUCTWORK AND MECHANICAL EQUIPMENT ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS, BUT KEEPING IN MIND ACTUAL BUILDING CONDITIONS WHICH MUST BE CONFORMED WITH IN THE ACTUAL WORK. CONTRACTORS IN THEIR BIDS ARE REQUIRED TO INCLUDE ALL LABOR AND MATERIALS AND OTHER RELATED WORK NECESSARY TO PROVIDE MINOR OFFSETS IN MECHANICAL WORK AS REQUIRED TO AVOID CONFLICT WITH OTHER WORK ON THIS PROJECT, OR AS REQUIRED IN ORDER TO OBTAIN MAXIMUM HEAD ROOM OR EQUIPMENT ACCESS IN SPACES.
 - PHASING - SEE DIVISION 1 PROJECT SPECIFICATION PHASING DOCUMENTS FOR SPECIFIC PHASING INSTRUCTIONS. COORDINATE SHUT-DOWN OF ANY UTILITY IN ADVANCE WITH THE OWNER. ACCOMPLISH DRAIN DOWN AND RE-FILL OF PIPING SYSTEMS AS REQUIRED. UNLESS OTHERWISE SPECIFICALLY INDICATED, EXISTING CHILLED WATER SYSTEMS SHALL NOT BE DISRUPTED DURING THE COOLING SEASON, AND HEATING SYSTEMS SHALL NOT BE DISRUPTED WHEN REQUIRED FOR OCCUPANT COMFORT OR BUILDING FREEZE PROTECTION.
 - MAINTAIN REQUIRED RIGGING ACCESS CLEARANCES. COORDINATE CLEARANCE REQUIREMENTS WITH OTHER TRADES.
 - EQUIPMENT CONNECTION ARRANGEMENTS, FLANGES, UNIONS, VALVING, ETC. ARE NOT TYPICALLY SHOWN ON PLAN VIEWS. REFER TO DETAILS AND FLOW DIAGRAMS FOR REQUIREMENTS. INSTALL ALL VALVES AND OTHER ITEMS REQUIRING OR FACILITATING MAINTENANCE IN ACCESSIBLE LOCATIONS, AND SO AS TO NOT OBSTRUCT MAINTENANCE ON EQUIPMENT SERVED.
 - SEE TEMPERATURE CONTROL DRAWINGS AND COORDINATE WITH TEMPERATURE CONTROL CONTRACTORS FOR INSTRUMENTATION DEVICES REQUIRED TO BE INSTALLED IN PIPING AND DUCTWORK, TOGETHER WITH NECESSARY CLEARANCES FOR SAME.

- ### HVAC DEMOLITION GENERAL NOTES
- THE GENERAL NOTES LISTED HERE APPLY TO ALL HVAC DEMOLITION DRAWINGS IN ADDITION TO ANY ADDITIONAL DEMOLITION DRAWING NOTES ON THE INDIVIDUAL DEMOLITION DRAWINGS.
 - SEE CODED NOTES ON INDIVIDUAL DRAWING SHEETS FOR SPECIFIC INSTRUCTIONAL NOTES.
 - FIELD VERIFY EXISTING CONDITIONS.
 - COORDINATE WITH GENERAL TRADES WORK, PLUMBING WORK, FIRE PROTECTION WORK, ELECTRICAL WORK AND OTHER WORK.
 - IT IS RECOGNIZED THAT DRAWINGS MAY BE PLOTTED AT DIFFERENT SCALES, SUCH THAT PLOTTED DRAWINGS MAY VARY FROM ACTUAL OR INTENDED DIMENSIONS. THEREFORE, DRAWINGS ARE DIAGRAMMATIC AND ARE NOT TO BE SCALED. SBM TAKES NO RESPONSIBILITY FOR ERRORS REGARDING DISCREPANCIES FROM THE ORIGINAL DRAWINGS DRAWN AT THE PROPER SCALE AND THOSE DRAWINGS THAT HAVE BEEN PLOTTED.
 - PHASING - SEE DIVISION 1 PROJECT SPECIFICATION PHASING DOCUMENTS FOR SPECIFIC PHASING INSTRUCTIONS. COORDINATE SHUT-DOWN OF ANY UTILITY IN ADVANCE WITH THE OWNER. ACCOMPLISH DRAIN DOWN AND RE-FILL OF PIPING SYSTEMS AS REQUIRED. UNLESS OTHERWISE SPECIFICALLY INDICATED, EXISTING CHILLED WATER SYSTEMS SHALL NOT BE DISRUPTED DURING THE COOLING SEASON, AND HEATING SYSTEMS SHALL NOT BE DISRUPTED WHEN REQUIRED FOR OCCUPANT COMFORT OR BUILDING FREEZE PROTECTION.
 - DARK, DASHED LINES INDICATE PIPING, DUCTWORK AND EQUIPMENT TO BE REMOVED.
 - SEE SPECIFICATIONS FOR GENERAL CUTTING AND PATCHING REQUIREMENTS REQUIRED UNDER DEMOLITION. ALSO SEE DRAWINGS FOR MORE SPECIFIC REQUIREMENTS.
 - SEE SPECIFICATIONS FOR SALVAGE RIGHTS TO ANY EQUIPMENT OR MATERIALS BEING REMOVED.
 - REMOVE ALL HANGERS AND SUPPORTS SERVING PIPING, DUCTWORK AND EQUIPMENT BEING DEMOLISHED. PROVIDE AND/OR ADJUST EXISTING HANGERS TO SUPPORT ANY REMAINING PIPING, DUCTWORK, OR EQUIPMENT ADJACENT TO DEMOLISHED.
 - CAP ALL REMAINING ACTIVE PIPING WITH SIMILAR MATERIALS TO MATCH EXISTING WATER-TIGHT. PIPE ENDS INDICATED TO BE CAPPED ARE NOT TO BE CRIMPED. INSULATED PIPING SHALL BE INSULATED AT CAP WITH MATERIALS SPECIFIED FOR NEW WORK.
 - CAP ALL REMAINING ACTIVE DUCTWORK WITH SIMILAR MATERIALS TO MATCH EXISTING AND SEALED AIR-TIGHT. INSULATED DUCTWORK SHALL BE INSULATED AT CAP WITH MATERIALS SPECIFIED FOR NEW WORK.
 - SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS FOR DEMOLITION OF REFRIGERANT CONTAINING MATERIALS OR EQUIPMENT.
 - REMOVE ALL THERMOSTATS, TEMPERATURE CONTROL WIRING AND PIPING FROM DEMOLISHED EQUIPMENT BACK TO (MAIN SOURCE/WALL) AND CAP CONTROL AIR PIPING AIR-TIGHT. CRIMPING SHALL NOT BE CONSIDERED ADEQUATE.

HVAC SYMBOL LEGEND

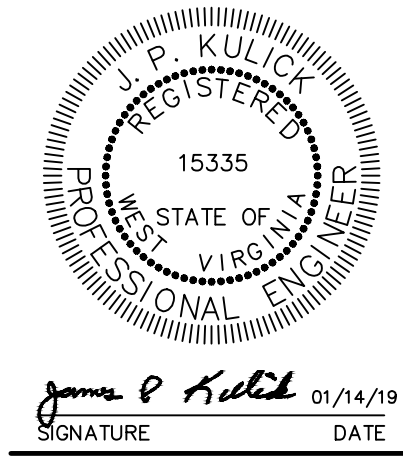
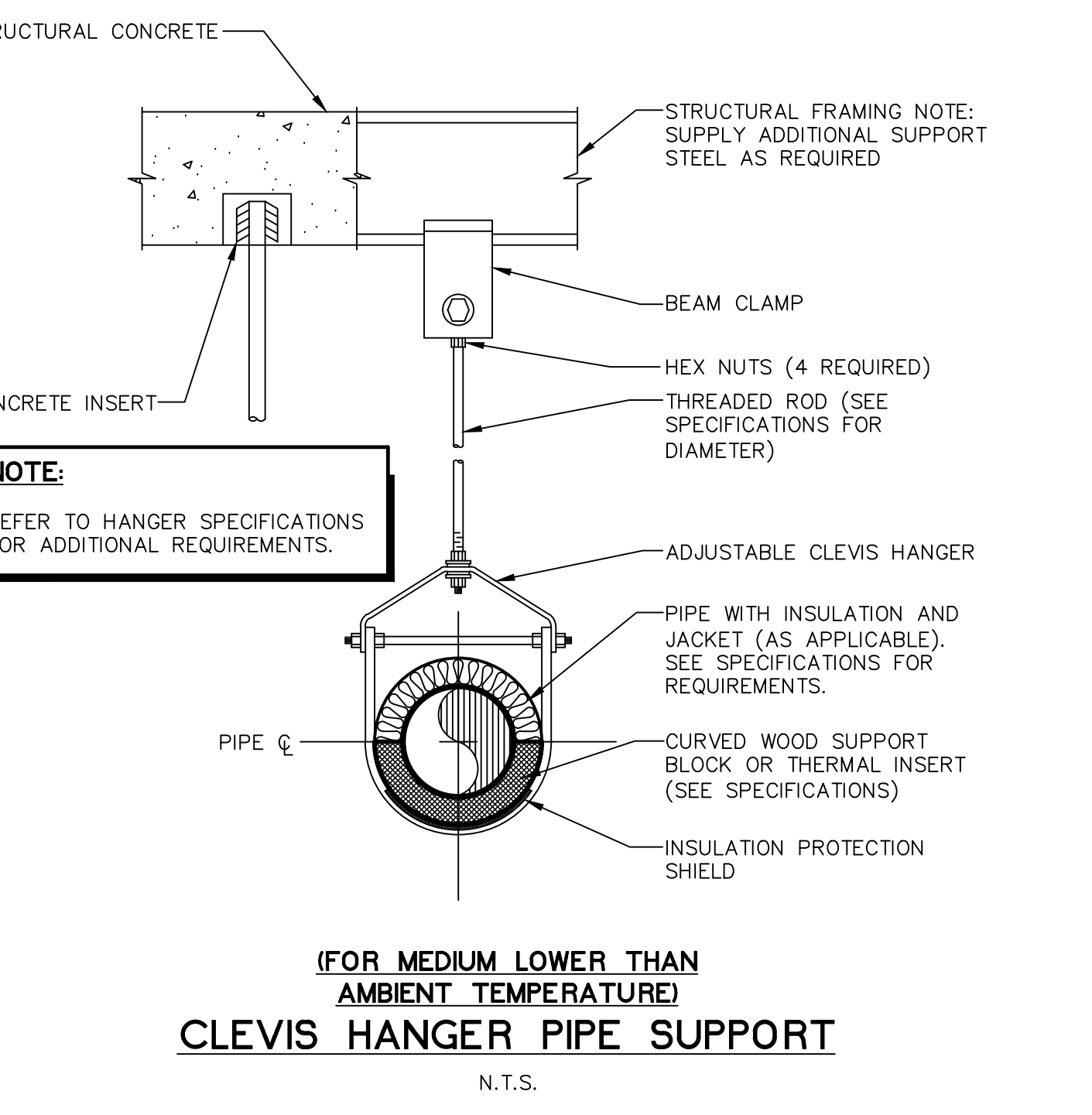
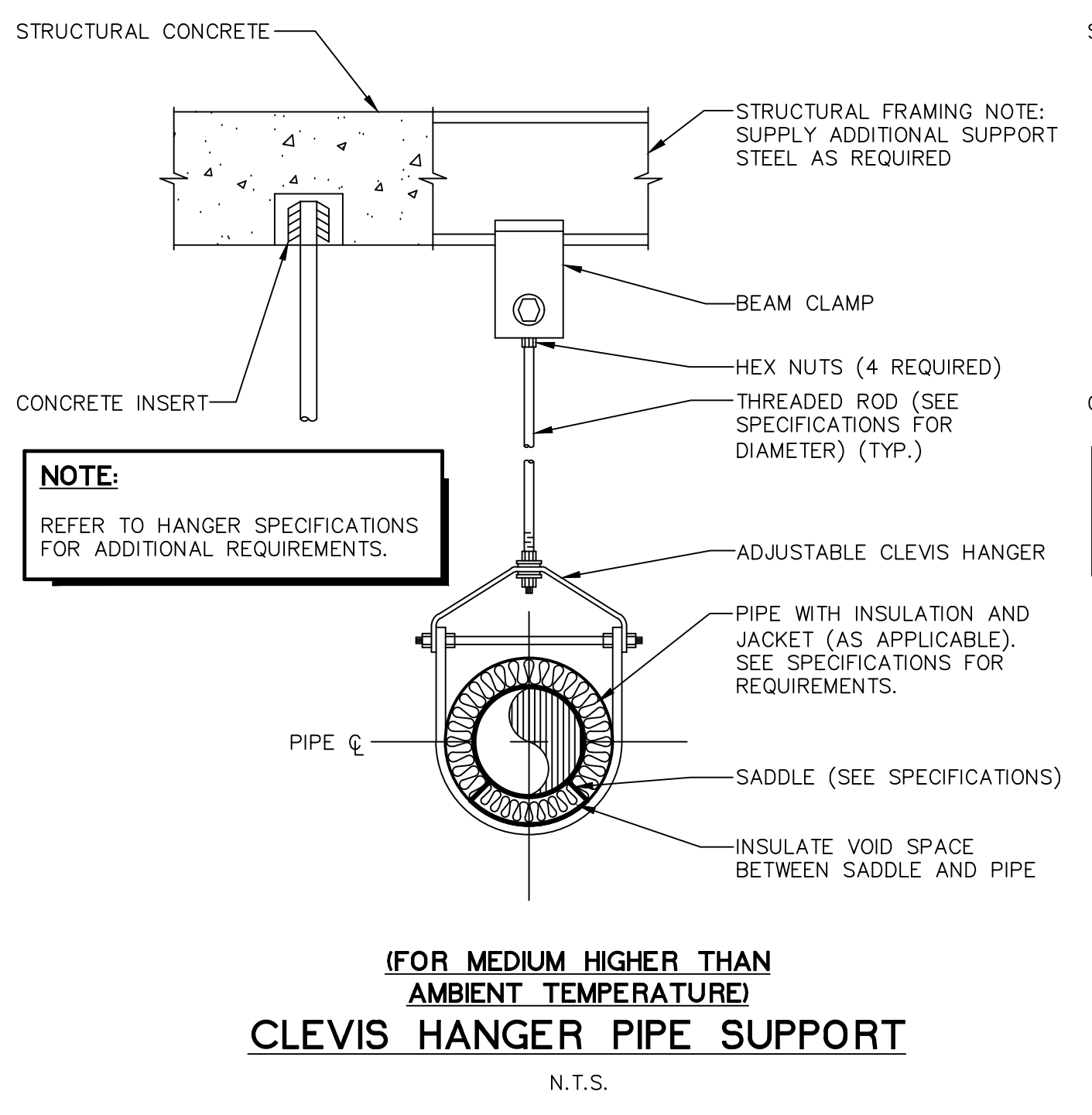
ABBREVIATION	SYMBOL	DESCRIPTION
HWS		HEATING WATER SUPPLY
HWR		HEATING WATER RETURN
CWS		CHILLED WATER SUPPLY
CWR		CHILLED WATER RETURN
TWS		TOWER WATER SUPPLY (TOWER TO CHILLER)
TWR		TOWER WATER RETURN (CHILLER TO TOWER)
MU		MAKE-UP WATER
V		STEAM EQUIPMENT ATMOSPHERIC VENT
		GLOBE VALVE
		BALL VALVE
		BALANCE VALVE (SEE SPECIFICATIONS)
		CHECK VALVE (SWING)
PRV		HYDRONIC PRESSURE REDUCING VALVE
		BUTTERFLY VALVE
RV		RELIEF OR SAFETY VALVE
		SOLENOID VALVE
		TWO WAY CONTROL VALVE
		THREE WAY CONTROL VALVE
		CONCENTRIC REDUCER/INCREASER
		STRAINER WITH BLOWDOWN
		UNION
		FLANGED UNION
		VIBRATION CONNECTION (SEE SPECIFICATIONS)
		FLOW METER FITTING
		PETE'S TEST PLUG
		MANUAL AIR VENT
		AUTOMATIC AIR VENT WITH BALL VALVE
		WATER METER
		THERMOSTAT
		THERMOMETER/TEMPERATURE GAUGE
		PRESSURE GAUGE WITH GAUGE COCK (WATER)
		PRESSURE GAUGE WITH BALL VALVE (WATER)
		CODED NOTE (SEE SCHEDULE)
ME		MECHANICAL EQUIPMENT (SEE SCHEDULE)
E.C.	E.C.	ELECTRICAL CONTRACTOR
F.P.C.	F.P.C.	FIRE PROTECTION CONTRACTOR
G.C.	G.C.	GENERAL CONTRACTOR
H.C.	H.C.	HVAC CONTRACTOR
P.C.	P.C.	PLUMBING CONTRACTOR
T.C.C.	T.C.C.	TEMPERATURE CONTROL SUB-CONTRACTOR
MFR.	MFR.	MANUFACTURER
N.O.	N.O.	NORMALLY OPEN
N.C.	N.C.	NORMALLY CLOSED
TYP.	TYP.	TYPICAL
E.A.	E.A.	EXHAUST AIR
		FLOW DIRECTION INDICATOR (LIQUID)
		MANUAL BALANCING DAMPER
		AUTOMATIC CONTROL DAMPER
		INDICATES TIE INTO EXISTING
		INDICATES REMOVE TO POINT FOR RECONNECTION
		INDICATES REMOVE TO POINT AND CAP



HOT WATER BOILER SCHEDULE

NO.	MAKE	MODEL	TYPE	FUEL	BURNER TYPE	BURNER HP	VOLTS/PH	MBH IN	MBH OUT	LWT DEG. F	GPM	MAX WPD FT H2O	RELIEF PSIG	REMARKS
B-2	BRYAN	HE-RV550	FORCED DRAFT	NAT. GAS	POWER	140	460/3	5,500	4,675	180	311	5	125	ALTERNATE #2

NOTES:
1. SEE SPECIFICATIONS FOR REQUIRED ACCESSORIES.



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BOILER AND CHILLER
REPLACEMENT

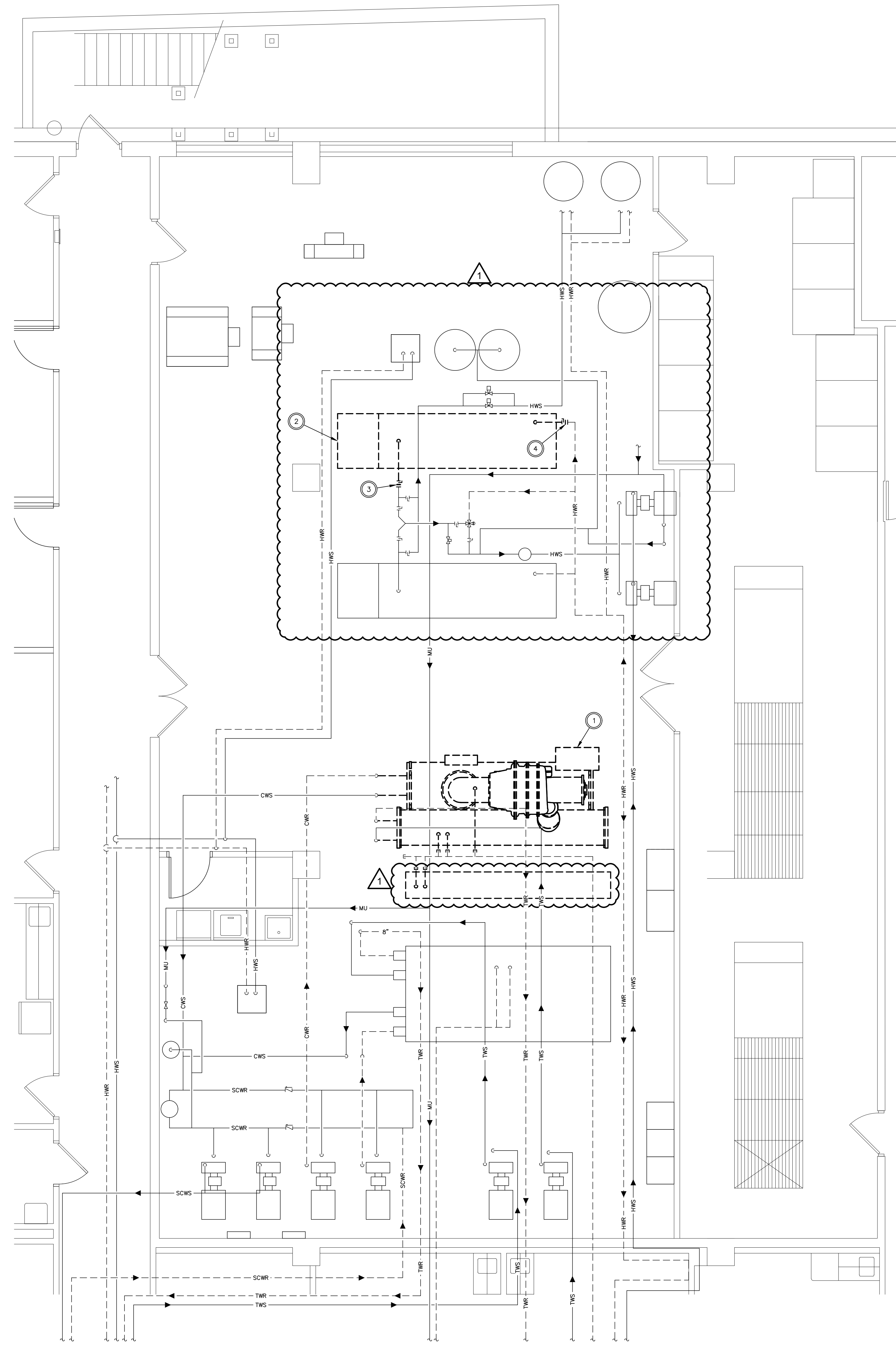
REVISIONS:
ADDENDUM #1

DATE: 01/14/19
DRAWN BY: JMB
CHECKED BY: JK
JOB NO.: 18111

GENERAL NOTES,
SYMBOL LEGEND,
DETAIL AND
SCHEDULES

M1

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PLAN NOTES

A. SEE SHEET M1 FOR GENERAL NOTES AND SYMBOL LEGEND.

B. EXISTING PIPING AND EQUIPMENT TO REMAIN SHOWN WITH LIGHT LINES.

C. EXISTING PIPING AND EQUIPMENT SHOWN TO BE REMOVED SHOWN WITH DARK DASHED LINES.

CODED NOTES

1. EXISTING CHILLER AND STORAGE VESSEL ALONGSIDE OF CHILLER TO BE REMOVED. DISCONNECT AND REMOVE ASSOCIATED CWS, CWR, TWS AND TWR PIPING BACK AS FAR AS NECESSARY TO INSTALL NEW CHILLER. EXISTING SHUT-OFF VALVES TO BE REPLACED. DISCONNECT AND REMOVE ASSOCIATED VENT PIPING BACK TO MAIN AND CAP AIR TIGHT.

2. EXISTING BOILER TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED PIPING AS SHOWN.

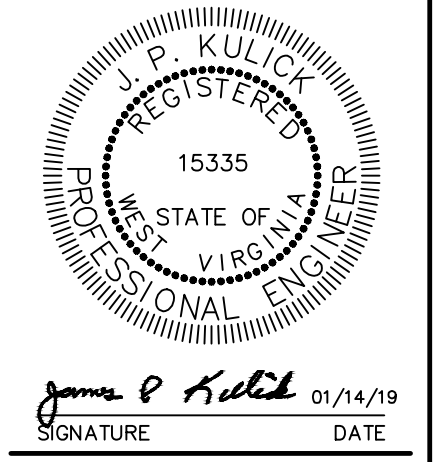
3. PRIOR TO PIPING REMOVAL INSTALL NEW BUTTERFLY VALVE IN EXISTING HWS PIPING, LINE SIZE. AFTER VALVE INSTALLATION REMOVE EXISTING HWS PIPING BACK TO VALVE FOR RECONNECTION UNDER NEW WORK.

4. PRIOR TO PIPING REMOVAL INSTALL NEW BUTTERFLY VALVE IN EXISTING HWR PIPING, LINE SIZE. AFTER VALVE INSTALLATION REMOVE EXISTING HWS BACK TO VALVE FOR RECONNECTION UNDER NEW WORK.

5. NOT USED.



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**MUSOM
BOILER AND CHILLER
REPLACEMENT**

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ADDENDUM #1

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DEMOLITION -
FLOOR PLAN -
HVAC (PIPING)

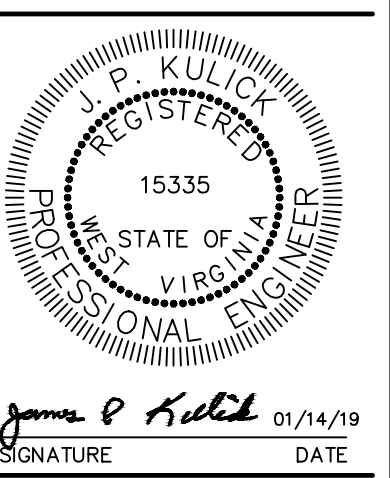
DEMOLITION - FLOOR PLAN - HVAC

0 4' 8'
SCALE

MD1



**SCHEESER
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**MUSOM
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REPLACEMENT**

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NEW WORK -
FLOOR PLAN -
HVAC (PIPING)

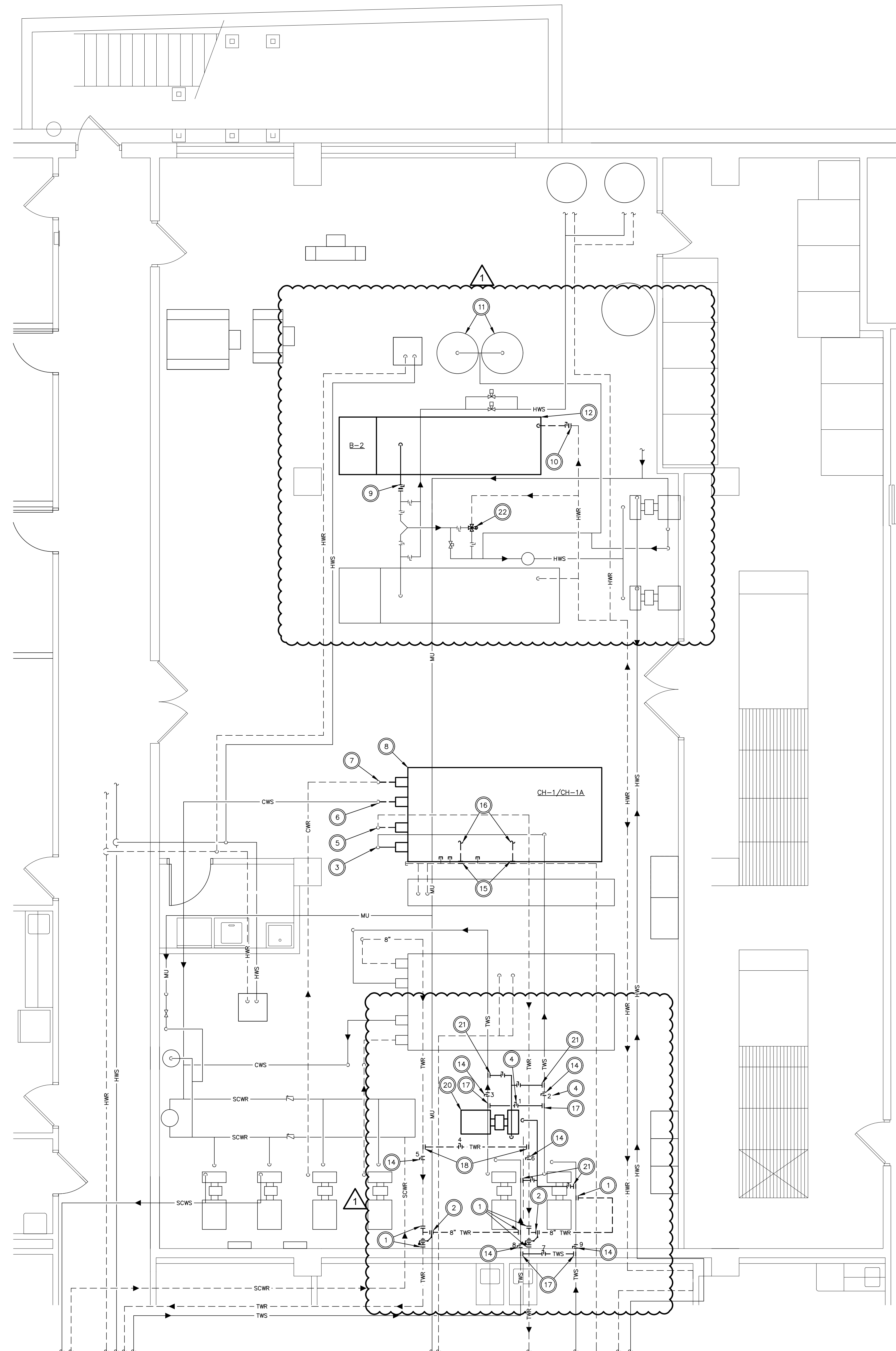
M3

PLAN NOTES

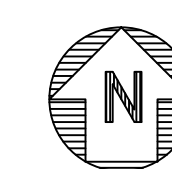
- A. SEE SHEET M1 FOR GENERAL, SYMBOL LEGEND, DETAILS AND SCHEDULES.
- B. SEE SHEET M4 FOR FLOW DIAGRAMS AND TEMPERATURE CONTROLS.
- C. EXISTING PIPING AND EQUIPMENT TO REMAIN SHOWN WITH LIGHT LINES.
- D. NEW PIPING AND EQUIPMENT SHOWN WITH DARK LINES.

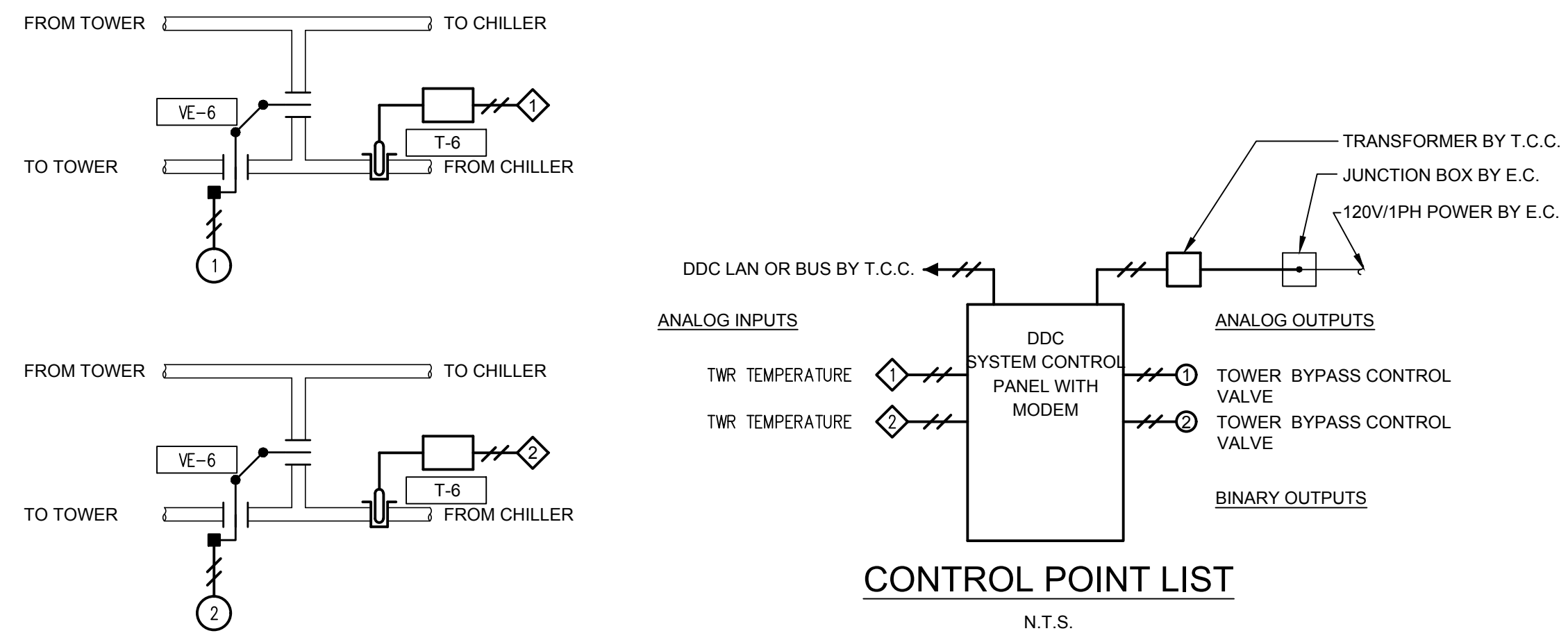
CODED NOTES

- 1. TIE NEW 8" TWR/TWS PIPING INTO EXISTING TWR/TWS PIPING AT POINTS INDICATED.
- 2. NEW 8" TOWER WATER BYPASS CONTROL VALVE.
- 3. TIE NEW 8" TWS PIPING INTO EXISTING 8" TWS PIPING AND EXTEND TO NEW CHILLER AND CONNECT AS REQUIRED. INSTALL NEW SHUT-OFF VALVES.
- 4. VALVE IDENTIFICATION, REFER TO "TOWER WATER CROSS CONNECT VALVE SEQUENCING" (TYP.).
- 5. TIE NEW 8" TWR PIPING INTO EXISTING 8" TWR PIPING AND EXTEND TO NEW CHILLER AND CONNECT AS REQUIRED. INSTALL NEW SHUT-OFF VALVES.
- 6. TIE NEW 6" CWS PIPING INTO EXISTING 6" CWS PIPING AND EXTEND TO NEW CHILLER AND CONNECT AS REQUIRED. INSTALL NEW SHUT-OFF VALVES.
- 7. TIE NEW 6" CWR PIPING INTO EXISTING 6" CWR PIPING AND EXTEND TO NEW CHILLER AND CONNECT AS REQUIRED. INSTALL NEW SHUT-OFF VALVES.
- 8. NEW CHILLER. MOUNT ON EXISTING CONCRETE PAD AND VIBRATION ISOLATION PADS. EXTEND EXISTING CONCRETE PAD AS REQUIRED FOR NEW CHILLER INSTALLATION.
- 9. TIE NEW 8" HWS PIPING INTO EXISTING HWS PIPING AT POINT INDICATED. INCREASE/REDUCE AT TIE-IN TO MATCH EXISTING PIPE SIZE (WORK TO BE PERFORMED UNDER ALTERNATE #2).
- 10. TIE NEW 6" HWR PIPING INTO EXISTING HWR PIPING AT POINT INDICATED. INCREASE/REDUCE AT TIE-IN TO MATCH EXISTING PIPE SIZE (WORK TO BE PERFORMED UNDER ALTERNATE #2).
- 11. REMOVE AND REINSTALL EXISTING TANKS IF NECESSARY FOR INSTALLATION OF NEW BOILER. (WORK TO BE PERFORMED UNDER ALTERNATE #2).
- 12. NEW HYDRONIC BOILER. SEE FLOW DIAGRAMS FOR PIPING ARRANGEMENT (WORK TO BE PERFORMED UNDER ALTERNATE #2).
- 13. NOT USED.
- 14. INSTALL NEW SHUT-OFF VALVES ON EXISTING PIPING. TO BE INSTALLED UNDER ALTERNATE.
- 15. 1" VENT PIPING. TIE INTO EXISTING VENT PIPING AT POINTS INDICATED.
- 16. EXTEND 1" VENT PIPING TO CHILLER RELIEF VALVES AND CONNECT AS REQUIRED.
- 17. TIE NEW TWS CROSS CONNECT PIPING INTO EXISTING TWS PIPING AT POINTS INDICATED. MATCH EXISTING PIPE SIZE. TO BE INSTALLED UNDER ALTERNATE.
- 18. TIE NEW TWR CROSS CONNECT PIPING INTO EXISTING TWR PIPING AT POINTS INDICATED. MATCH EXISTING PIPE SIZE. TO BE INSTALLED UNDER ALTERNATE.
- 19. VALVE IDENTIFICATION, REFER TO "TOWER WATER CROSS CONNECT VALVE SEQUENCING" (TYP.).
- 20. NEW TOWER WATER PUMP, PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR. SEE "END SUCTION WATER PUMP ISOMETRIC".
- 21. TIE NEW TWS PIPING INTO EXISTING TWS PIPING AT POINT INDICATED.
- 22. REMOVE INSULATION, VERIFY VALVE MAKE AND MODEL AND DETERMINE MODE OF OPERATION.



NEW WORK - FLOOR PLAN - HVAC





SEQUENCE OF OPERATIONS

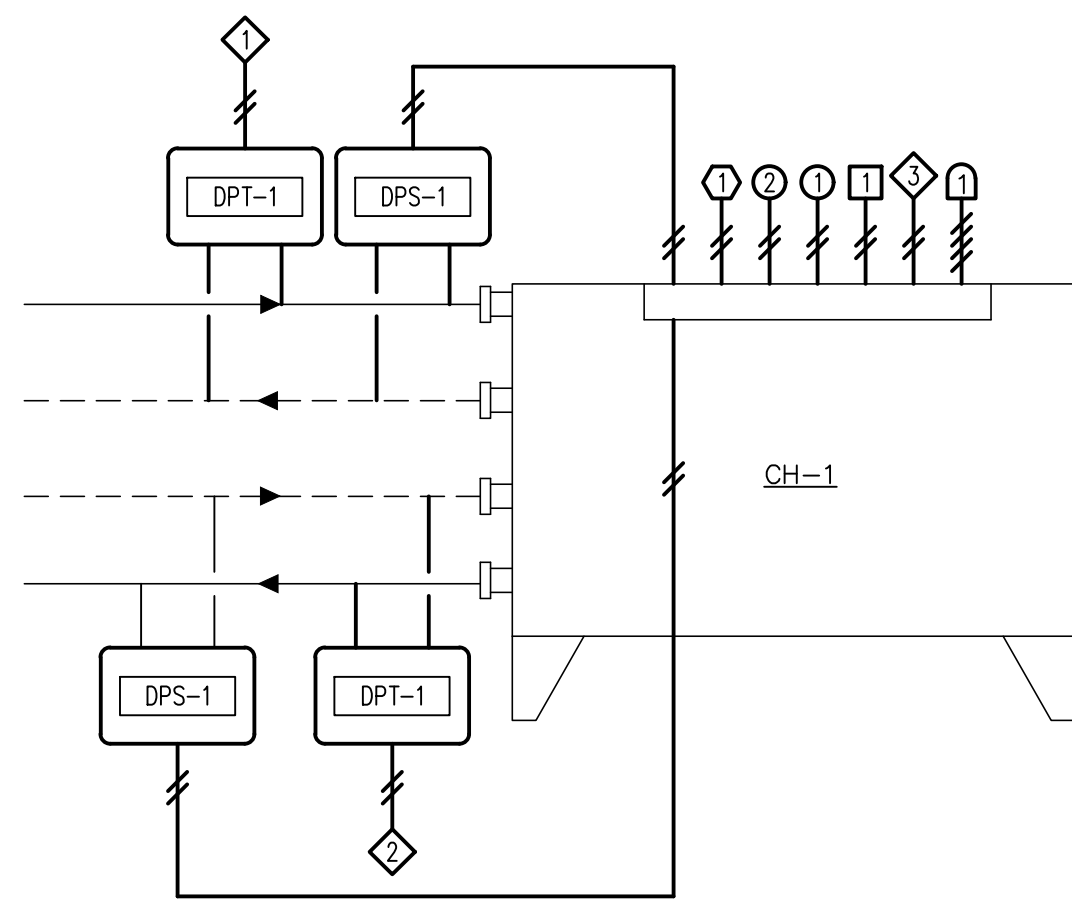
A. TOWER WATER BYPASS VALVE CONTROL:
 1. THE COOLING TOWER BYPASS VALVE SHALL MODULATE TO MAINTAIN SYSTEM TEMPERATURE SETPOINT ABOVE CHILLER MINIMUM TOWER WATER SUPPLY OF APPROXIMATELY 70 DEG. F. VALVE SHALL FAIL NORMALLY CLOSED AND SHALL OPEN ON CHILLER SHUTDOWN PROVIDED OUTDOOR AIR TEMPERATURE IS LESS THAN 70 DEG. F.

TOWER WATER BYPASS CONTROL DIAGRAM
N.T.S.

CONTROL POINT LIST

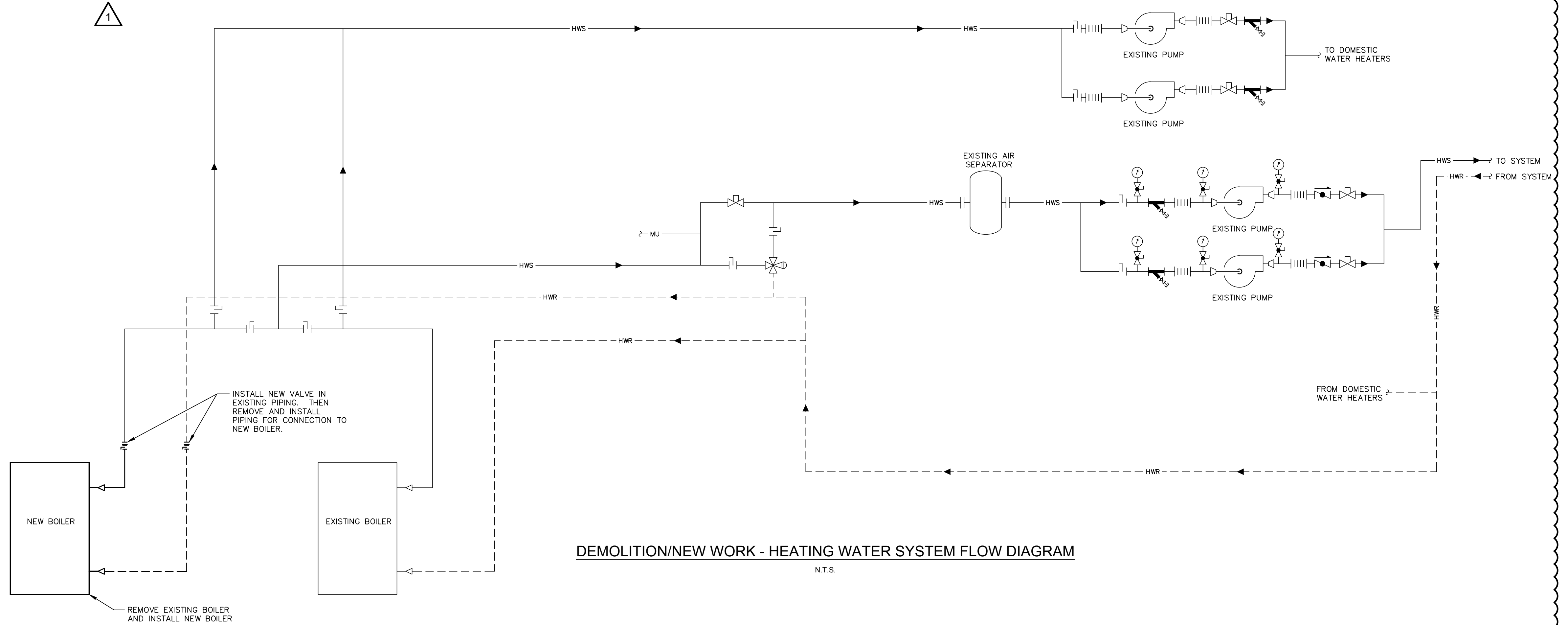
N.T.S.

ABBREVIATION	DESCRIPTION	REMARKS
CSR	CURRENT SENSING RELAY	
E.C.	ELECTRICAL CONTRACTOR	
FS-1	HYDRONIC FLOW SWITCH	
MFR.	MANUFACTURER	
N.C.	NORMALLY CLOSED	
N.O.	NORMALLY OPEN	
T-6	PIPE INSERTION LIQUID TEMPERATURE SENSOR	
VE-6	NORMALLY OPEN (N.O.) ELECTRIC MODULATING THREE-WAY HYDRONIC CONTROL VALVE	



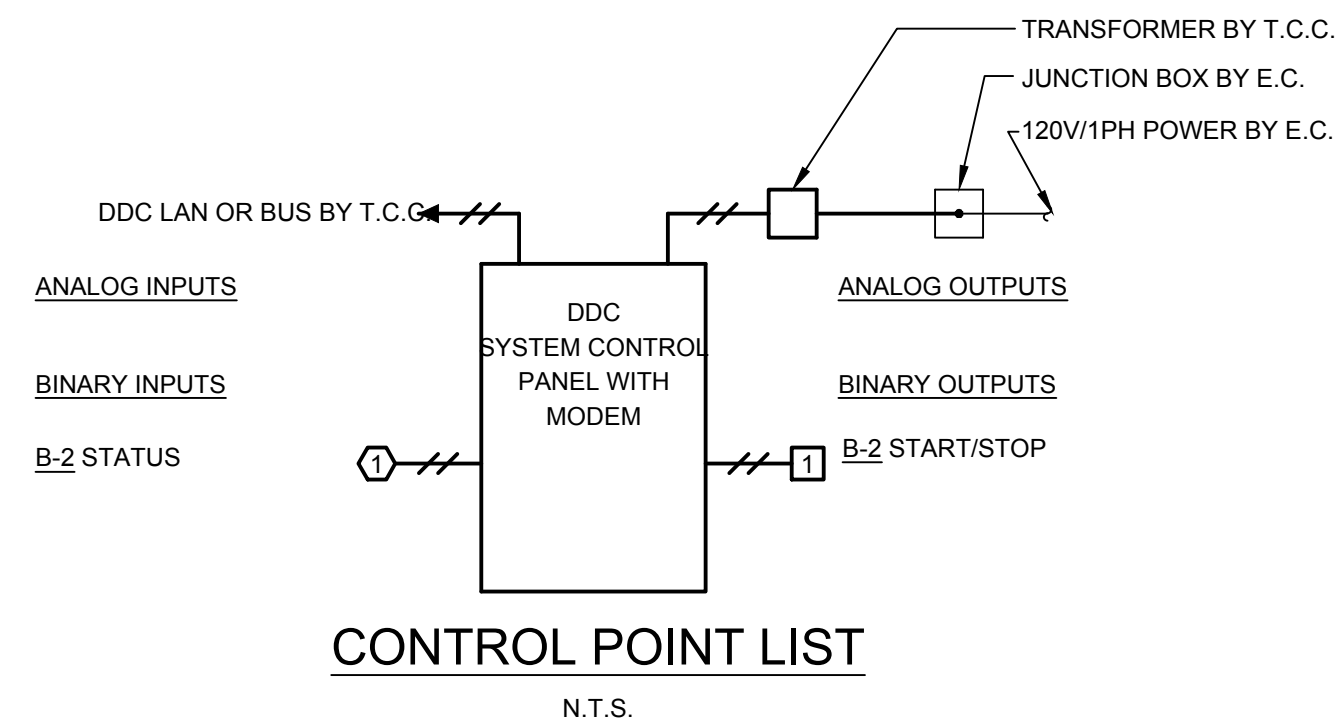
CHILLER CONTROL DIAGRAM

N.T.S.



DEMOLITION/NEW WORK - HEATING WATER SYSTEM FLOW DIAGRAM

N.T.S.



CONTROL POINT LIST

N.T.S.

BOILER CONTROL DIAGRAM

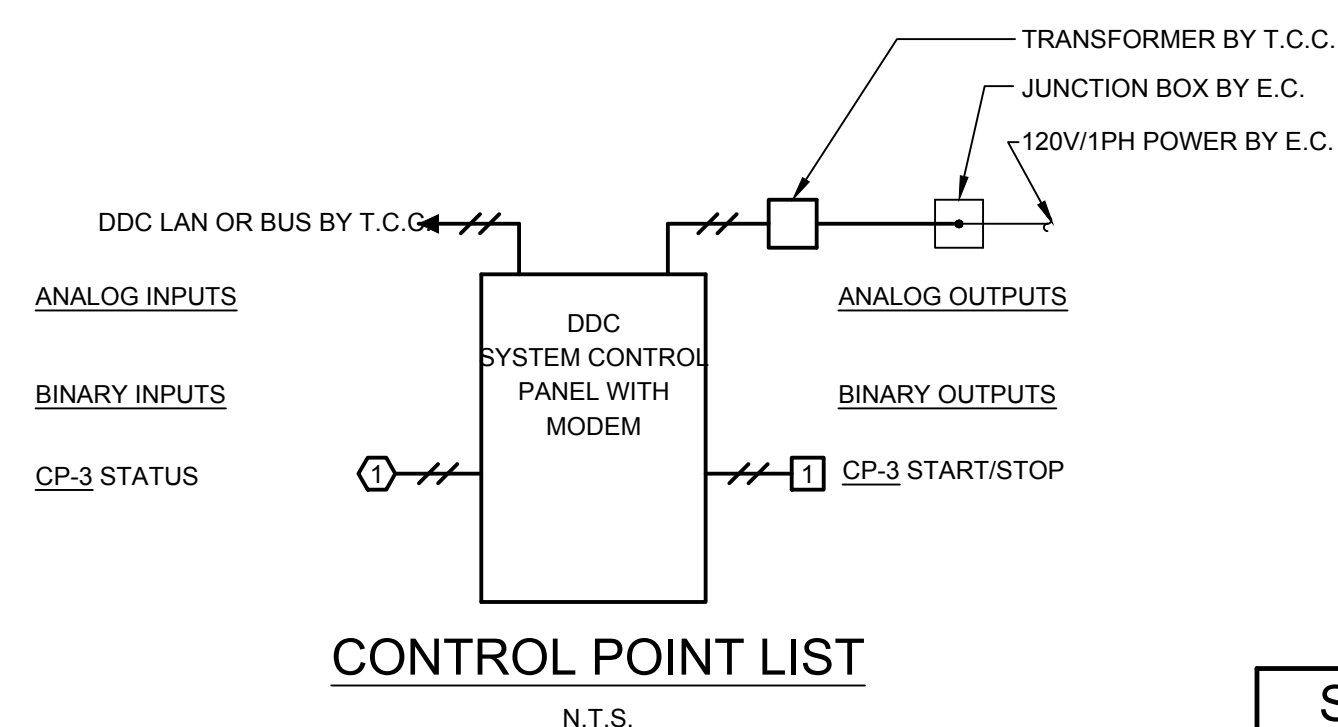
N.T.S.

ALTERNATE #2

ALL WORK ASSOCIATED WITH BOILER REPLACEMENT TO BE PERFORMED UNDER ALTERNATE #2.

SEQUENCE OF OPERATIONS

A. BOILER CONTROL:
 1. MAINTAIN EXISTING SEQUENCE OF OPERATIONS. ADJUST 3-WAY CONTROL VALVE TO FUNCTION AS ORIGINALLY INTENDED.



CONTROL POINT LIST

N.T.S.

CONDENSER WATER PUMP, CP-3 CONTROL DIAGRAM

N.T.S.

SEQUENCE OF OPERATIONS

A. CONDENSER WATER PUMP, CP-3 SEQUENCE OF OPERATIONS:
 1. IF CP-3 OR CP-3 FAIL, CP-3 SHALL BE MANUALLY SELECTED IN THE DDC PROGRAM BY THE BUILDING OPERATOR. IF THAT TIME THE CONTROL SEQUENCE SHALL AUTOMATICALLY CONTROL CP-3 IN LEU OF PUMP WHICH FAILED.

HVAC CONTROLS GENERAL NOTE

JOHNSON CONTROLS ARE THE EXISTING CONTROLS IN THE BUILDING AND NO OTHER CONTROLS MANUFACTURER ARE ACCEPTABLE.
 CONTRACTOR SHALL BE RESPONSIBLE TO EXTEND ALL NEW TEMPERATURE CONTROLS INTO EXISTING PANELS. IF EXISTING PANELS ARE NOT AVAILABLE NEW PANELS SHALL BE PROVIDED. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NEW DEVICES, RELAYS, ETC. AS REQUIRED FOR INSTALLATION OF NEW CONTROLS TO MEET ALL SEQUENCE OF OPERATIONS. ALL PANELS, DEVICES, ETC. TO MEET MARSHALL UNIVERSITY STANDARDS.



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 STATE OF OHIO
 15335
 01/24/19
 SIGNATURE DATE

**MUSOM
 BOILER AND CHILLER
 REPLACEMENT**

REVISIONS:
 ADDENDUM #1

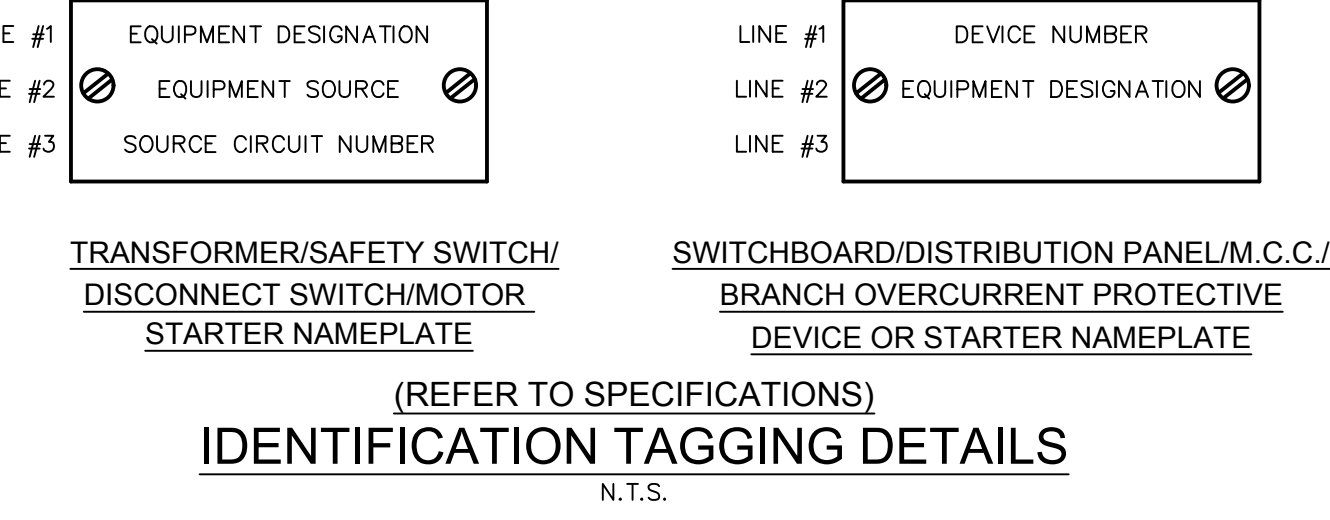
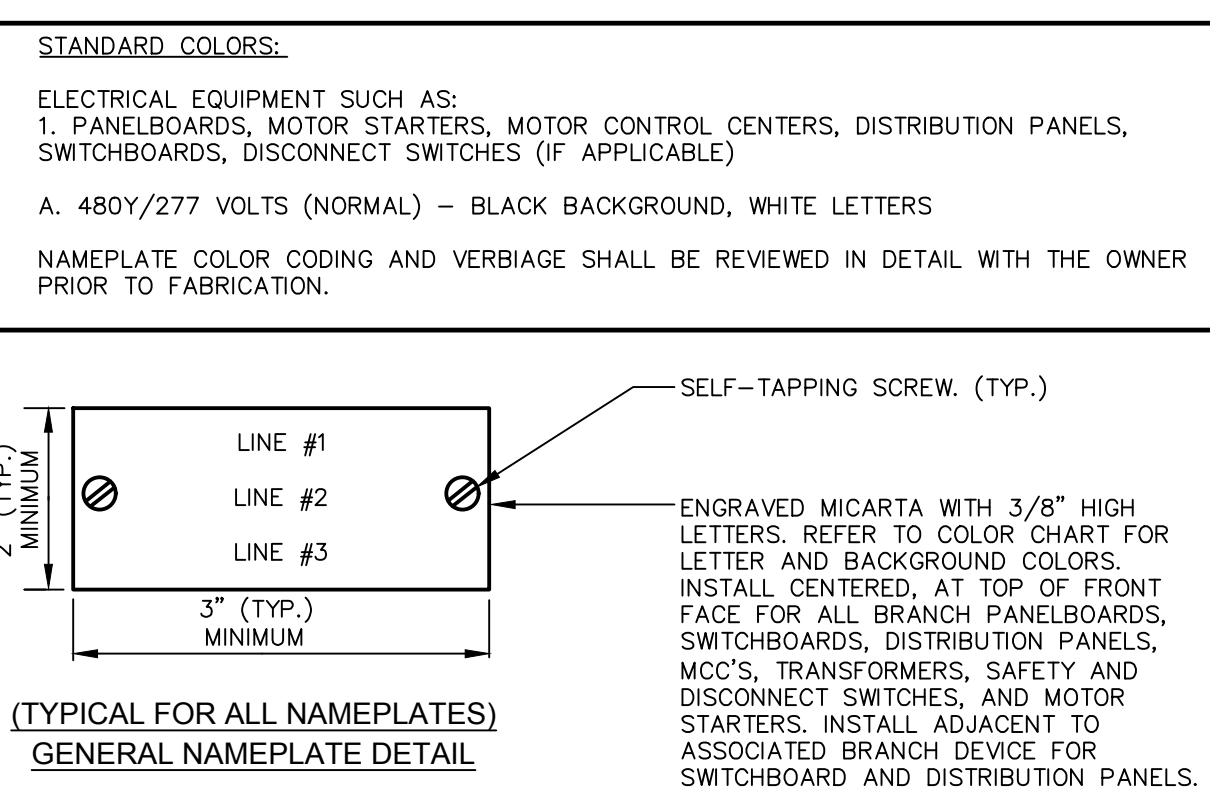
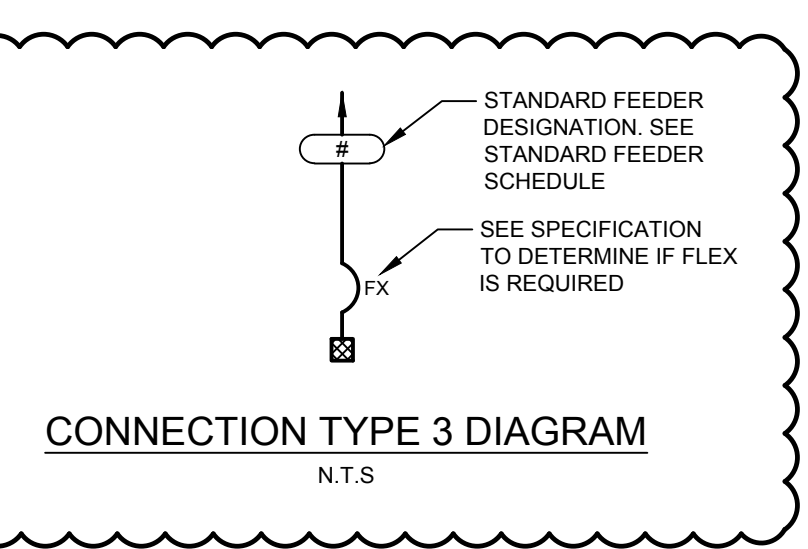
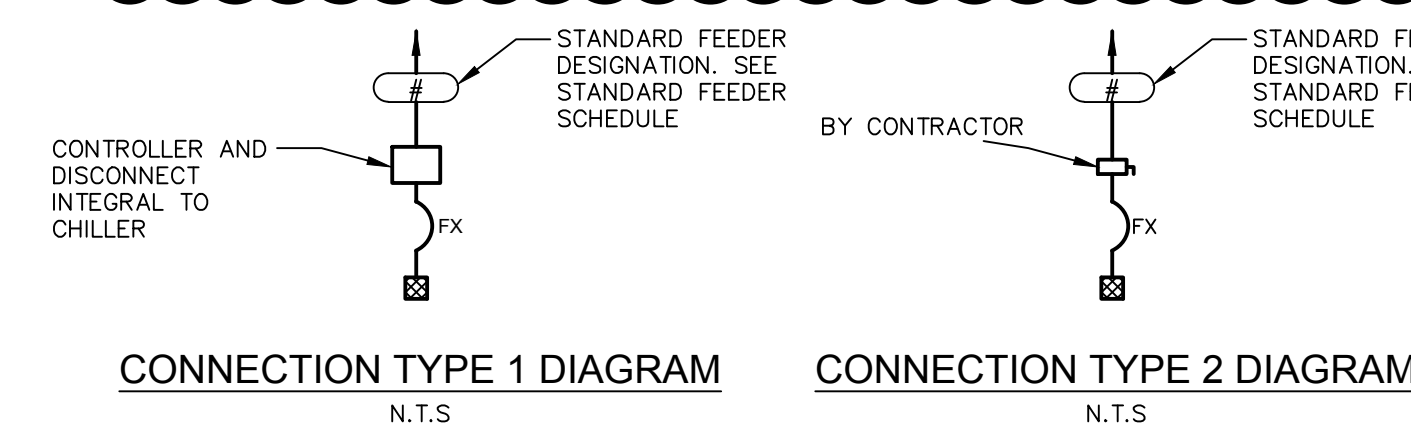
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 CHECKED BY: JK
 JOB NO.: 18111

DEMO/NEW WORK -
 FLOW DIAGRAMS
 & TEMPERATURE
 CONTROLS

MECHANICAL EQUIPMENT SCHEDULE NOTES

1. SEE STANDARD FEEDER SCHEDULE FOR MORE INFORMATION.
2. WHERE THE DISCONNECT IS LISTED AS "INTEGRAL", THE UNIT IS BEING SUPPLIED WITH AN "INTEGRAL" DISCONNECTING MEANS, WHERE A SIZE, TYPE, ETC. IS SHOWN, IT IS TO BE FURNISHED AND INSTALLED BY CONTRACTOR.
3. WHERE THE STARTER IS LISTED AS "INTEGRAL", THE UNIT IS BEING SUPPLIED WITH AN "INTEGRAL" STARTER, WHERE A STARTER DESIGNATION IS SHOWN, IT IS TO BE FURNISHED AND INSTALLED BY CONTRACTOR. SEE THE MOTOR STARTER SCHEDULE FOR MORE INFORMATION.
4. SEE CONNECTION TYPE DIAGRAMS FOR MORE INFORMATION.

MECHANICAL EQUIPMENT DESIGNATION	DESCRIPTION	LOCATION	APPARENT POWER	HP	VOLTAGE	PHASE	WIRE/CONDUIT (NOTE 1)	PANEL	CIRCUIT(S)	DISCONNECT DESIGNATION	DISCONNECT DESCRIPTION (NOTE 2)	DISCONNECT LOCATION	STARTER DESCRIPTION (NOTE 3)	CONNECTION TYPE (NOTE 4)	REMARKS
CH-1	CHILLER	SEE PLANS	123,840	--	480	3	450B		REFER TO RISER DIAGRAM	REFER TO RISER DIAGRAM	INTEGRAL		INTEGRAL	1	VERIFY REQUIREMENTS WITH MECHANICAL CONTRACTOR
CH-1A	CHILLER (ALTERNATE)	SEE PLANS	122,400	--	480	3	500B		REFER TO RISER DIAGRAM	REFER TO RISER DIAGRAM	INTEGRAL		INTEGRAL	1	VERIFY REQUIREMENTS WITH MECHANICAL CONTRACTOR
B-2	BOILER	SEE PLANS	--	3	480	3	30B		REFER TO RISER DIAGRAM	REFER TO RISER DIAGRAM	DS-B2	30A/3P/600V/NF/NEMA1	ADJACENT TO UNIT	2	
CP-3	CONDENSER WATER PUMP	SEE PLANS	--	20	480	3	40B		REFER TO RISER DIAGRAM	REFER TO RISER DIAGRAM	SEE MCC-13	--		3	



FEEDER SCHEDULE

FEEDER NO.	WIRE SIZE AMP'S NOMINAL FEEDER SIZE (AMP'S)	CONDUCTOR SIZE (AWG)		CONDUIT SIZE		
		PHASE / NEUTRAL	GROUND	A	B	C
		CU	CU	W/C CU	W/G CU	W/G CU
15	15	12	12	3/4"	3/4"	3/4"
20	20	12	12	3/4"	3/4"	3/4"
25	25	10	10	3/4"	3/4"	3/4"
30	30	10	10	3/4"	3/4"	3/4"
35	35	8	10	3/4"	3/4"	3/4"
40	40	8	10	3/4"	3/4"	3/4"
45	45	8	10	3/4"	3/4"	3/4"
50	50	8	10	3/4"	3/4"	3/4"
60	60	6	10	3/4"	3/4"	1"
70	70	4	8	1"	1"	1-1/2"
80	80	4	8	1"	1"	1-1/2"
90	90	3	8	1"	1-1/2"	1-1/2"
100	100	2	8	1"	1-1/2"	1-1/2"
110	110	2	6	1"	1-1/2"	1-1/2"
125	125	1	6	1-1/2"	1-1/2"	1-1/2"
150	150	1/0	6	1-1/2"	1-1/2"	2"
175	175	2/0	6	1-1/2"	2"	2"
200	200	3/0	6	1-1/2"	2"	2"
225	225	4/0	4	2"	2"	2-1/2"
250	250	250	4	2"	2-1/2"	2-1/2"
300	300	350	4	2-1/2"	3"	3"
350	350	500	3	3"	3"	3"
400	400	500	3	3"	3"	3"
450	450	4/0	2	2 PARALLEL RUNS OF 2-1/2"	2 PARALLEL RUNS OF 2-1/2"	2 PARALLEL RUNS OF 2-1/2"
500	500	250	2	2 PARALLEL RUNS OF 2-1/2"	2 PARALLEL RUNS OF 2-1/2"	2 PARALLEL RUNS OF 2-1/2"
600	600	350	1	2 PARALLEL RUNS OF 3"	2 PARALLEL RUNS OF 3"	2 PARALLEL RUNS OF 3"

POWER LEGEND

SYMBOL	DESCRIPTION
⊕	STANDARD STEEL JUNCTION BOX WITH COVER. LOCATE AND CONNECT AS DIRECTED. SUBSCRIPT INDICATES EQUIPMENT SERVED.
⊗	POINT OF CONNECTION TO ELECTRIFIED EQUIPMENT. VERIFY EXACT LOCATION WITH RESPECTIVE EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.
⊖	FUSIBLE DISCONNECT SWITCH, HEAVY DUTY TYPE, (UNLESS NOTED OTHERWISE ON DRAWINGS) COMPLETE WITH FUSE RINGS SIZED TO PROTECT MOTOR, EQUIPMENT OR CONDUCTORS (WHICHEVER IS APPLICABLE). SIZE, POLES, AND TYPE AS INDICATED. HORSEPOWER RATED, QUICK-MAKE, QUICK-BREAK.
PAN	208/120V, 3Φ, 4W PANELBOARD.
PAN	480/277V, 3Φ, 4W PANELBOARD.
DIST. PAN	DISTRIBUTION PANEL.

GENERAL LEGEND

SYMBOL	DESCRIPTION
—	EXPOSED BRANCH CIRCUIT HOMERUN. FOR NORMAL BRANCH CIRCUIT WIRING, CONTRACTOR MAY COMBINE UP TO THREE HOMERUNS IN ONE RACEWAY ON A WYE SYSTEM AND TWO HOMERUNS IN ONE RACEWAY ON A DELTA SYSTEM. QUANTITY OF MARKS INDICATE NUMBER OF CONDUCTORS. #12 AWG MINIMUM SIZE CONDUCTORS UNLESS NOTED OTHERWISE. ALL RACEWAYS TO CONTAIN SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTOR. NEUTRAL CONDUCTOR SHALL NOT BE SHARED BETWEEN CIRCUITS. REFER TO SPECIFICATIONS FOR RACEWAY TYPE.
—	RACEWAY UP. QUANTITY OF MARKS INDICATE NUMBER OF CONDUCTORS. #12 AWG MINIMUM SIZE CONDUCTOR UNLESS NOTED OTHERWISE. ALL RACEWAYS TO CONTAIN SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTOR. NEUTRAL CONDUCTOR SHALL NOT BE SHARED BETWEEN CIRCUITS. REFER TO SPECIFICATIONS FOR RACEWAY TYPE.
—	RACEWAY DOWN. QUANTITY OF MARKS INDICATE NUMBER OF CONDUCTORS. #12 AWG MINIMUM SIZE CONDUCTOR UNLESS NOTED OTHERWISE. ALL RACEWAYS TO CONTAIN SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTOR. NEUTRAL CONDUCTOR SHALL NOT BE SHARED BETWEEN CIRCUITS. REFER TO SPECIFICATIONS FOR RACEWAY TYPE.
—	FLEXIBLE METAL CONDUIT OR LIQUIDTIGHT FLEXIBLE METAL CONDUIT (REFER TO SPECIFICATIONS) AND WRING. QUANTITY OF MARKS INDICATE NUMBER OF CONDUCTORS. #12 AWG MINIMUM SIZE CONDUCTOR UNLESS NOTED OTHERWISE. ALL RACEWAYS TO CONTAIN SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTOR. NEUTRAL CONDUCTOR SHALL NOT BE SHARED BETWEEN CIRCUITS. REFER TO SPECIFICATIONS FOR RACEWAY TYPE.
—	RACEWAY AND CONDUCTORS RUN EXPOSED ON CEILING OR WALLS. QUANTITY OF MARKS INDICATE NUMBER OF CONDUCTORS. #12 AWG MINIMUM SIZE CONDUCTOR UNLESS OTHERWISE NOTED. ALL RACEWAYS TO CONTAIN SEPARATE EQUIPMENT GROUNDING CONDUCTOR. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTOR. NEUTRAL CONDUCTOR SHALL NOT BE SHARED BETWEEN CIRCUITS. REFER TO SPECIFICATIONS FOR RACEWAY TYPE.
—	EXISTING RACEWAY OR BRANCH CIRCUIT.
⊕	ALL ITEMS SHOWN DASHED ON DEMOLITION PLANS TO BE REMOVED (UNLESS OTHERWISE NOTED).

ABBREVIATION LEGEND

SYMBOL	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
BCF	BELOW COMPUTER ROOM FLOOR
CLG	CEILING
DP	DISTRIBUTION PANEL
EC	ELECTRICAL CONTRACTOR
EMT	GALVANIZED ELECTRIC METALLIC TUBING (THINWALL), UL LISTED
GC	GENERAL CONTRACTOR
GRC	GALVANIZED, RIGID, HEAVY WALL CONDUIT, UL LISTED
MC	MECHANICAL CONTRACTOR (HVAC)
MCC	MOTOR CONTROL CENTER
PAN	PANELBOARD
PC	PLUMBING CONTRACTOR
PVC	CARLON PLASTIC CONDUIT, HEAVY WALL TYPE, POLYVINYL CHLORIDE, UL LISTED, SCHEDULE 40 UNLESS NOTED OTHERWISE.
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
"X"	SUBSCRIPT "X" BY SYMBOL INDICATES EXISTING ITEM TO REMAIN.

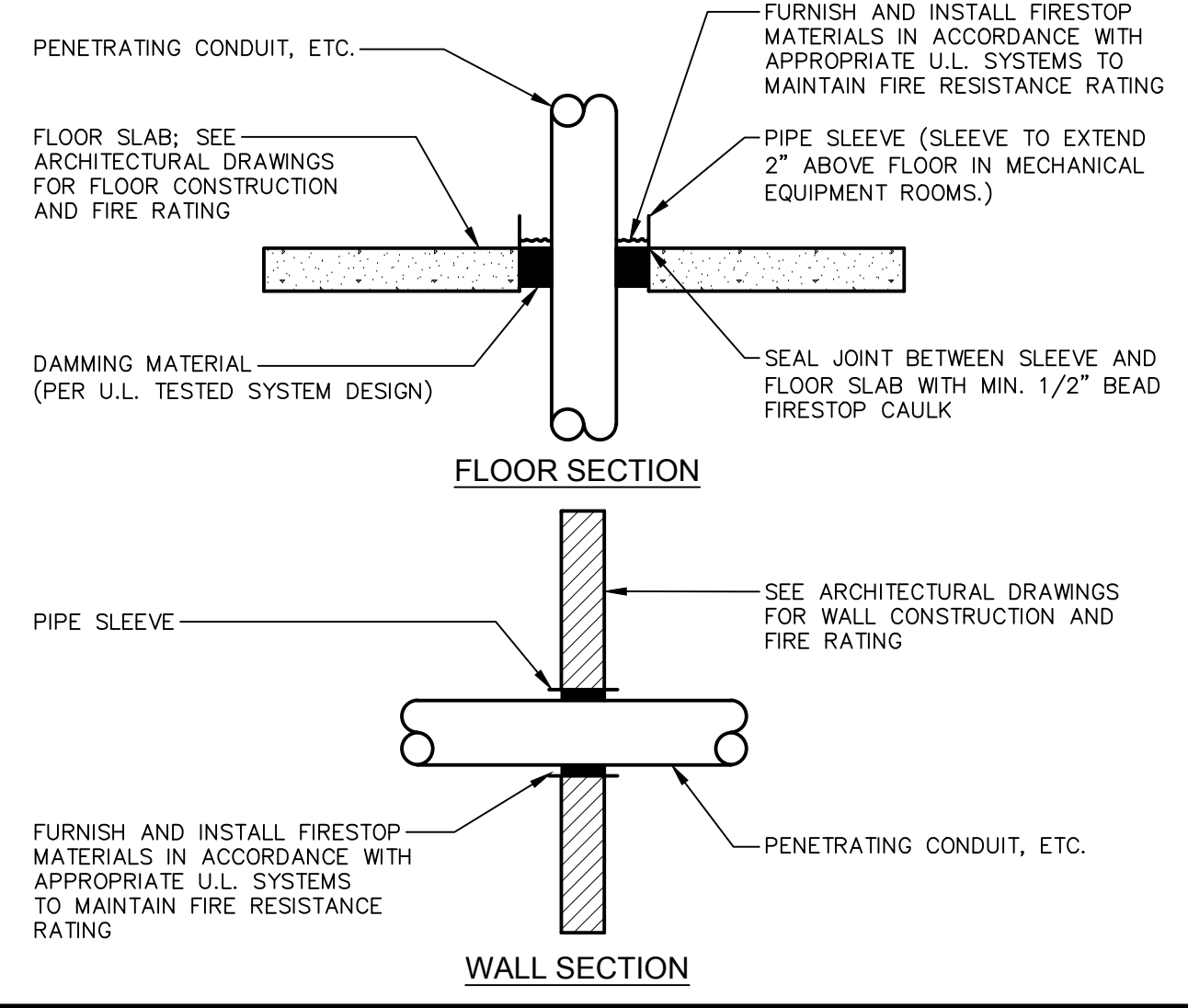
SCHEDULE OF ALTERNATES

- ALTERNATE #1: ALL WORK ASSOCIATED WITH ALTERNATE CHILLER CH-1A.
 ALTERNATE #2: ALL WORK ASSOCIATED WITH BOILERS #1 AND #2.

ELECTRICAL GENERAL NOTES

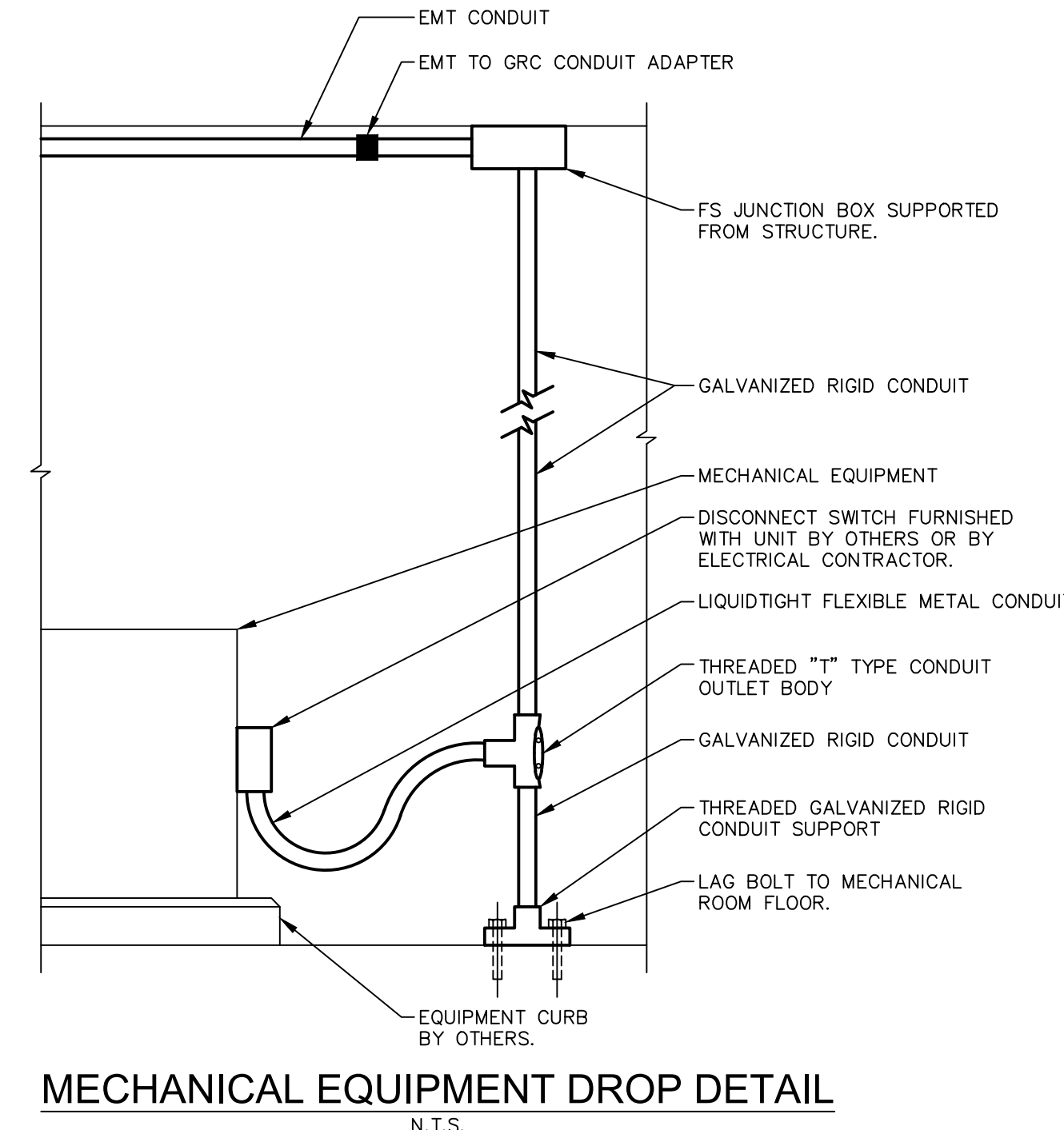
1. THE GENERAL NOTES LISTED HERE APPLY TO ALL ELECTRICAL DRAWINGS IN ADDITION TO ANY ADDITIONAL DRAWING NOTES ON THE INDIVIDUAL DRAWINGS.
2. ALL EXISTING ELECTRICAL DEVICES WITHIN HATCHED AREAS TO REMAIN IN OPERATION UNLESS SHOWN OTHERWISE. REFER ANY ITEM WHOSE WIRING IS INTERRUPTED DUE TO WORK IN ADJACENT AREAS.
3. DARK DASHED ITEMS INDICATE ELECTRICAL EQUIPMENT, DEVICES, AND/OR LIGHTING TO BE REMOVED UNDER THE DEMOLITION PHASE OF PROJECT.
4. SEE SPECIFICATIONS FOR GENERAL CUTTING AND PATCHING REQUIREMENTS DURING DEMOLITION AND NEW CONSTRUCTION PHASES. REFER TO DRAWINGS FOR MORE SPECIFIC REQUIREMENTS.
5. SEE SPECIFICATIONS FOR SALVAGE RIGHTS TO ANY EQUIPMENT OR MATERIALS BEING REMOVED.
6. REMOVE ALL HANGERS AND SUPPORTS SERVING CONDUIT AND WIRE TO BE DEMOLISHED. PROVIDE AND/OR ADJUST EXISTING HANGERS TO SUPPORT ANY REMAINING CONDUIT AND WIRE, OR EQUIPMENT ADJACENT, TO REMAIN.
7. REMOVE ALL EXISTING WIRE FROM CONDUITS TO BE ABANDONED. REFER TO SPECIFICATIONS FOR REQUIREMENTS REGARDING ABANDONED CONDUITS.
8. CONTRACTOR SHALL REMOVE AND REINSTALL ALL CEILING MATERIAL AS REQUIRED FOR ELECTRICAL WORK SHOWN. REPLACE ALL MATERIAL DAMAGED BY THIS CONTRACTOR.
9. SEE CODED NOTES ON INDIVIDUAL DRAWING SHEETS FOR SPECIFIC INSTRUCTIONAL NOTES.
10. FIELD VERIFY EXISTING CONDITIONS.
11. COORDINATE ELECTRICAL WORK WITH ALL CONTRACTORS ON SITE (GENERAL TRADES, PLUMBING, FIRE PROTECTION, HVAC, ETC) PRIOR TO COMMENCEMENT OF DEMOLITION/CONSTRUCTION WORK.
12. THE ELECTRICAL DESIGN DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATION OF EQUIPMENT, LIGHTING, AND DEVICES UNLESS DIMENSIONS ARE GIVEN FOR CLEARANCES, ETC. LIGHTING, DEVICES AND ELECTRICAL EQUIPMENT ARE TO BE INSTALLED ALONG THE GENERAL PLANS SHOWN ON THE DRAWINGS, BUT KEEPING IN MIND ACTUAL BUILDING CONDITIONS WHICH MUST BE CONFIRMED WITH-IN THE ACTUAL WORK AREA. CONTRACTORS, IN THEIR BIDS, ARE REQUIRED TO INCLUDE ALL LABOR AND MATERIALS AND OTHER RELATED WORK NECESSARY TO PROVIDE MINOR OFFSETS IN ELECTRICAL INSTALLATION TO AVOID CONFLICT WITH OTHER WORK ON THIS PROJECT, OR AS REQUIRED IN ORDER TO OBTAIN MAXIMUM HEAD ROOM OR EQUIPMENT ACCESS IN SPACES.
13. PHASING - SEE DIVISION 1 PROJECT SPECIFICATION PHASING DOCUMENTS FOR SPECIFIC PHASING INSTRUCTIONS. COORDINATE SHUT-DOWN OF ANY UTILITY IN ADVANCE WITH THE OWNER.
14. MAINTAIN REQUIRED RIGGING ACCESS CLEARANCES. COORDINATE CLEARANCE REQUIREMENTS WITH OTHER TRADES.
15. COORDINATE ALL MASONRY PENETRATION LOCATIONS AND SIZES.
16. AN ATTEMPT HAS BEEN MADE TO SHOW ALL ELECTRICAL ITEMS TO REMAIN OR BE REMOVED. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS AND REMOVE AND/OR RELOCATE ANY ITEM WHICH INTERFERES WITH NEW CONSTRUCTION.
17. POWER AND TELECOM RISER PULL BOXES MAY NOT BE SHOWN. PROVIDE PULL BOXES AT LOCATIONS REQUIRED. IN NO CASE SHALL A FEEDER CONDUIT HAVE BENDS OF MORE THAN 270° WITHOUT THE INSTALLATION OF A PULL BOX.
18. PROVIDE FIRESEALING OF ALL OPENINGS THROUGH FIRE RATED WALLS AND ASSEMBLIES. SEE DETAIL SHEETS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

SERVICE	GYPSUM WALL PENETRATION	CONCRETE/MASONRY WALL PENETRATION	CONCRETE FLOOR PENETRATION
GRC CONDUIT (NOMINAL ≤ 6" DIA.)	WL1049	WS1055	CAJ1079
EMT CONDUIT (NOMINAL ≤ 4" DIA.)	WL1049	WS1055	CAJ1079
PVC CONDUIT / INNER DUCT (≤ 2" DIA.)	WL2093	WU2018	CAJ2031
CABLES (MAX. 3" DIA. CABLE BUNDLE)	WL3076	WU3022	CAJ3133
CABLE TRAYS	WL4005	WU4009	CAJ4029
BUS DUCT	WL6001	CAJ6008	CAJ6008

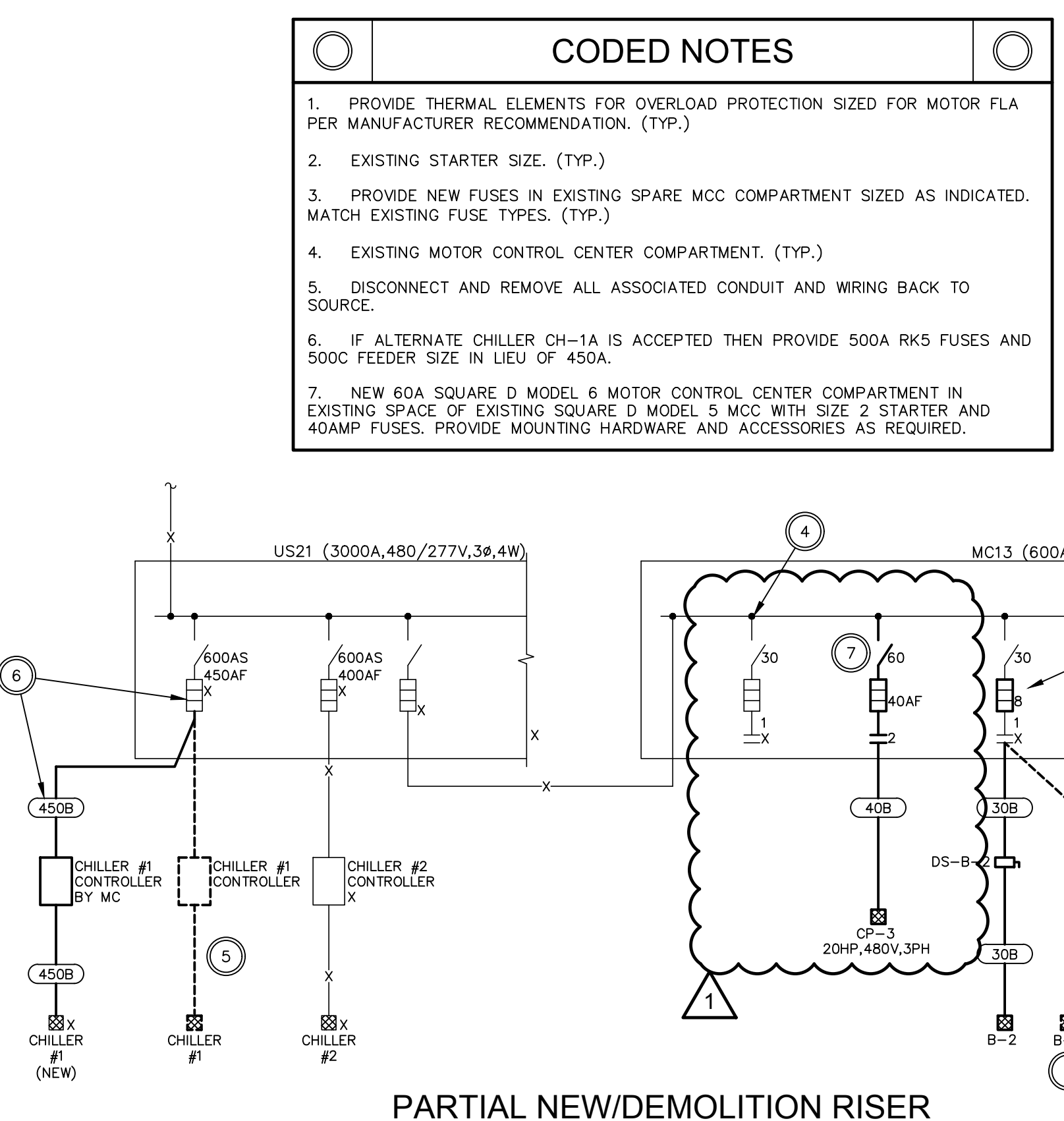


- NOTES:
1. WHERE CONDUIT, CABLES AND OTHER COMPONENTS PASS THROUGH FIRE OR SMOKE RATED WALLS OR FLOORS, PROVIDE NON-ASBESTOS SEAL ASSEMBLIES CLASSIFIED BY U.L. TO PROVIDE FIRE BARRIERS EQUAL TO OR GREATER THAN THE TIME RATING OF THE CONSTRUCTION BEING PENETRATED, WITH APPROPRIATE MATERIALS AND SYSTEMS THAT COMPLY WITH APPLICABLE CODES AND THAT HAVE BEEN TESTED IN ACCORDANCE WITH U.L. 1479 OR ASTM E814.
 2. GROUT, MORTAR OR GYPSUM BASED PRODUCTS SHALL NOT BE INSTALLED IN LIEU OF FIRESTOPPING MATERIALS AND U.L. SYSTEMS.
 3. FOR SLEEVED PENETRATIONS, FIRESTOP ANNUAL SPACE, IF ANY, BETWEEN SLEEVE AND ADJACENT CONSTRUCTION TO MEET U.L. SYSTEM REQUIREMENTS. SEE NOTE 2 ABOVE.
 4. THIS CONTRACTOR SHALL FIRESTOP ALL MISCELLANEOUS OPENINGS IN FIRE-RATED CONSTRUCTION RESULTING FROM HIS WORK.
 5. CONTRACTOR SHALL PROVIDE SUBMITTAL DRAWINGS TO ENGINEER, INCLUDING U.L. RATED SYSTEM NUMBER AND DETAIL FOR EACH TYPE OF PENETRATION AND CONFIGURATION.
 6. SLEEVES USED FOR CABLE RISERS THROUGH FLOORS OR WALLS SHALL BE INSTALLED PER THE ABOVE FLOOR OR WALL SECTIONS. IN ADDITION, FIRESTOP MATERIAL SHALL BE PROVIDED INSIDE SLEEVE AFTER CABLES ARE COMPLETELY INSTALLED.

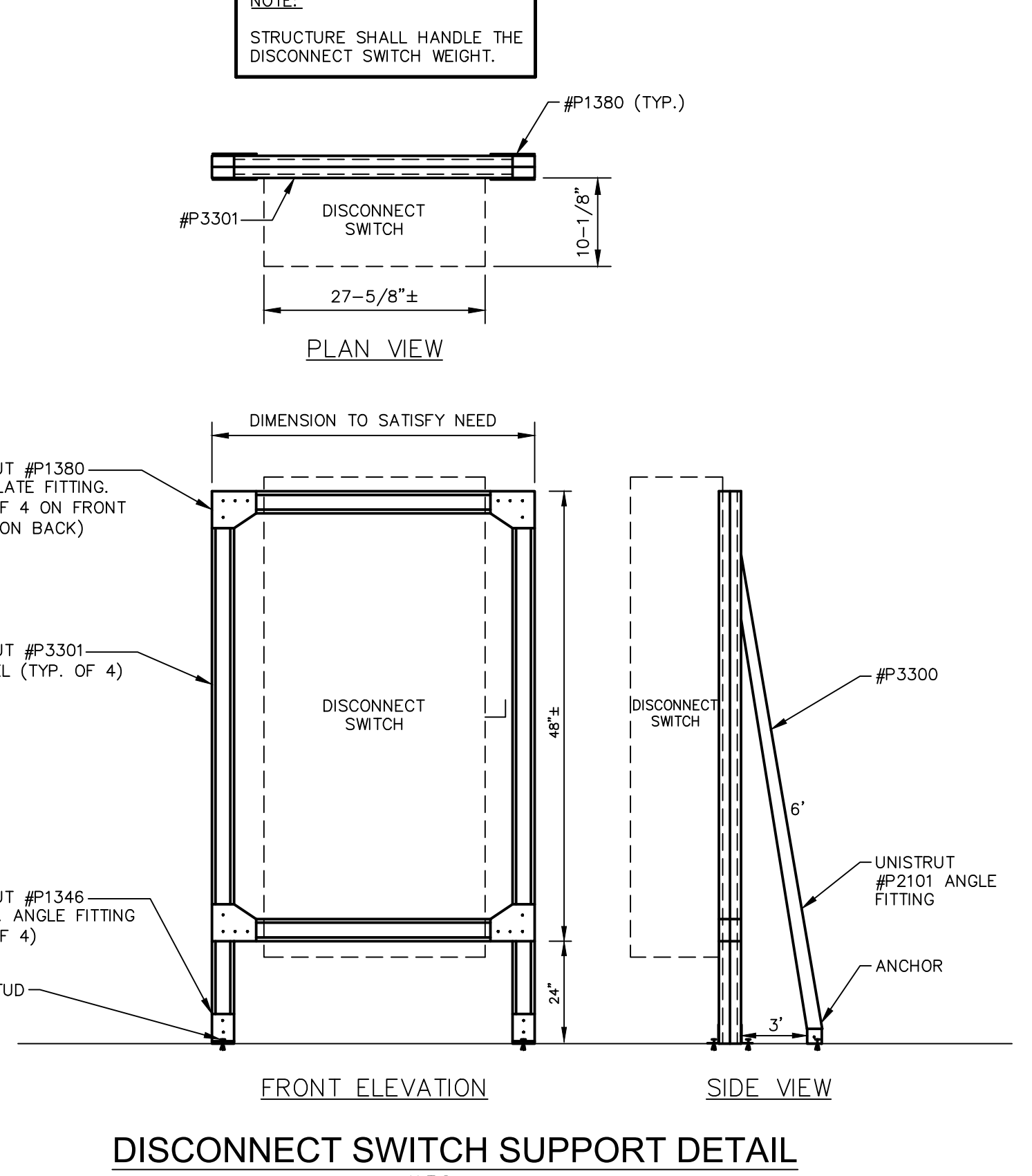
FIRESTOPPING DETAIL FOR PENETRATIONS THROUGH FIRE-RATED CONSTRUCTIONS



MECHANICAL EQUIPMENT DROP DETAIL



PARTIAL NEW/DEMOLITION RISER



DISCONNECT SWITCH SUPPORT DETAIL

SBM
SCHLESER BUCKLEY MAYFIELD
 1540 CORPORATE WOODS PARKWAY
 UNIONTOWN, OHIO 44685
 PHONE: 330-526-2700
 SBMCE.COM

REGISTERED PROFESSIONAL ELECTRICAL ENGINEER
 STATE OF VIRGINIA
 No. 11374
 SIGNATURE: J.E.A. DATE: 01/14/19

MUSOM BOILER AND CHILLER REPLACEMENT

REVISIONS:

NO.	DESCRIPTION	DATE	BY
ADDENDUM #1		01/14/19	G.W.H.
			M.M.H.
		18111	

NOTES, LEGENDS, DETAILS

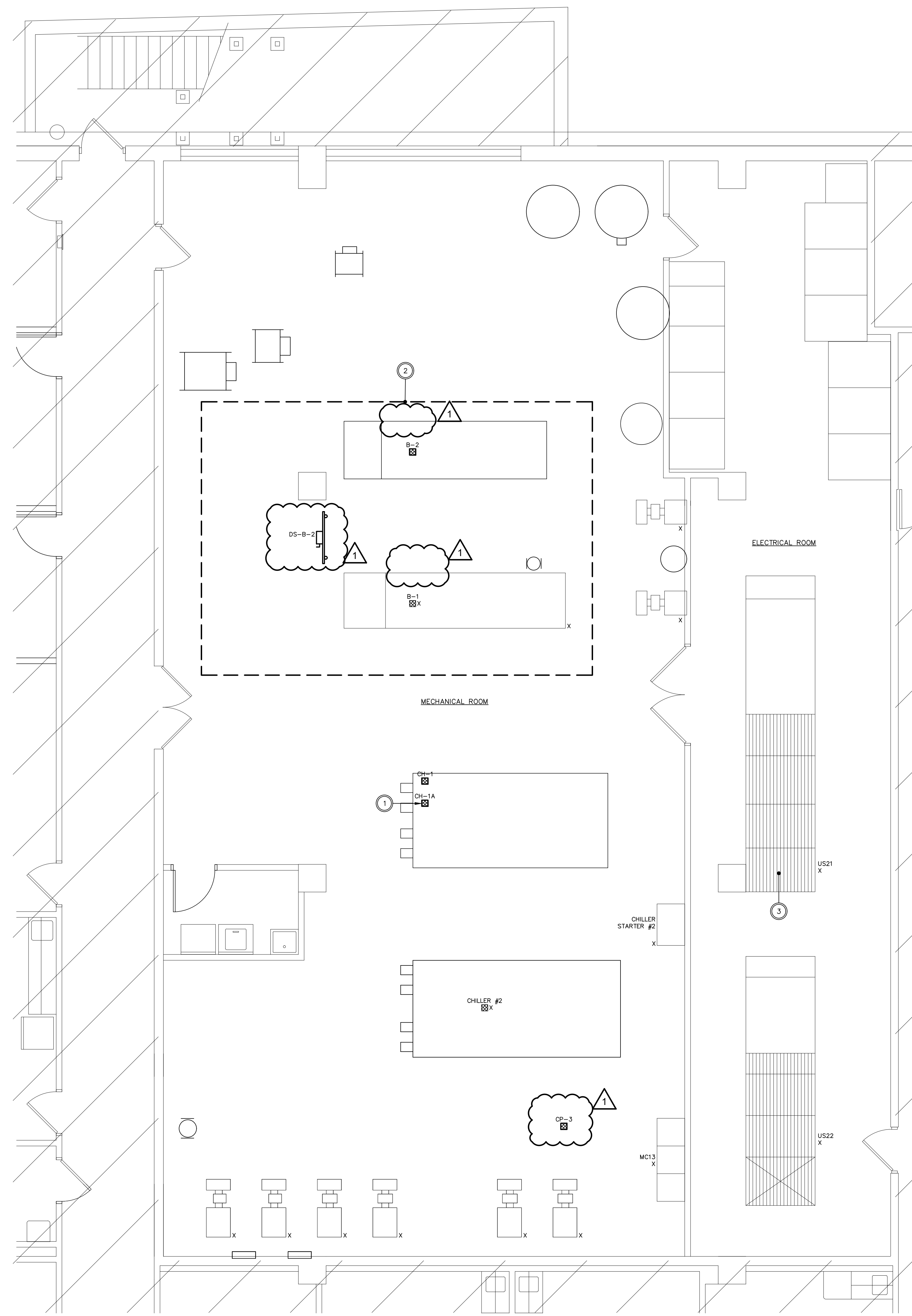
E1

PLAN NOTES

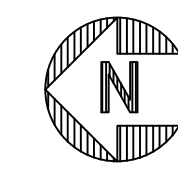
- A. VERIFY REQUIREMENTS WITH MECHANICAL CONTRACTOR.
- B. REFER TO MECHANICAL EQUIPMENT SCHEDULE AND PARTIAL POWER RISER DIAGRAM FOR DETAILS.
- C. REWORK EXISTING LIGHTING FIXTURES AND ASSOCIATED CONDUIT AND WIRING AS REQUIRED FOR REWORK AND INSTALLATION OF NEW WORK.

CODED NOTES

- 1. ASSOCIATED CH-1A WORK TO BE COMPLETED UNDER ALTERNATE #1 IN LIEU OF CH-1.
- 2. ALL ASSOCIATED WORK TO BE COMPLETE UNDER ALTERNATE #2.
- 3. CHILLER FEEDER FUSED SWITCH LOCATED IN THIS SECTION. REFER TO DIAGRAM FOR DETAILS.



POWER - FLOOR PLAN - ELECTRICAL



**MUSOM
BOILER AND CHILLER
REPLACEMENT**

REVISIONS:
ADDENDUM #1

DATE: 01/14/19
DRAWN BY: G.W.J.
CHECKED BY: M.M.H.
JOB NO.: 18111

POWER -
FLOOR PLAN -
ELECTRICAL