

Invitation to Bid

<p>Lallie Kemp Medical Center</p> <p>VENDOR NO. : SOLICITATION : 000532 OPENING DATE : 11/19/2020 PRINT YOUR COMPANY'S NAME & ADDRESS BELOW:</p> <p>_____</p> <p>_____</p> <p>_____</p>		<p>BIDS WILL BE PUBLICLY OPENED:</p> <p>November 19,2020 10:00 AM</p> <p>Return Sealed Bid to: Purchasing Department 52579 Highway 51 South Independence LA 70443</p> <p>BUYER : McIntyre Margaret S BUYER PHONE : 985/878-1472 DATE ISSUED : 10/12/2020 REQ. NO : 0021490 FISCAL YEAR : 2021</p>
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From Req ID - 0021490

INSTRUCTIONS TO BIDDERS

1. READ THE ENTIRE BID, INCLUDING ALL TERMS AND CONDITIONS AND SPECIFICATIONS.

DIVERSE SUPPLIER

(A) SUPPLIER UNDERSTANDS THAT LSU, AS THE STATE'S FLAGSHIP UNIVERSITY, HAS AN INTEREST IN PROVIDING ENTREPRENEURIAL OPPORTUNITIES TO DIVERSITY-OWNED BUSINESSES. THE UNIVERSITY IS DEDICATED TO PROMOTING THE GROWTH AND DEVELOPMENT OF MINORITY, WOMEN, AND SMALL AND HISTORICALLY UNDERUTILIZED BUSINESSES ("DIVERSE BUSINESSES") BY PROVIDING OPPORTUNITIES TO PARTICIPATE IN UNIVERSITY CONTRACTS.

(B) IN SUPPORT OF THIS COMMITMENT, THE SUPPLIER SHALL USE GOOD FAITH AND BEST EFFORTS TO PROVIDE OPPORTUNITIES TO DIVERSE BUSINESSES THAT ARE EITHER CERTIFIED BY THE STATE OR ANOTHER CERTIFYING AGENCY IN A DIVERSE CATEGORY, AS A SUBCONTRACTOR OR SUPPLIER UNDER THIS AGREEMENT.

(C) IF APPLICABLE, SUPPLIER SHALL PROVIDE LSU WITH A LIST OF DIVERSITY-OWNED BUSINESSES DURING EACH CONTRACT YEAR, THE LIST OF BUSINESSES SHOULD IDENTIFY:

- (1) THE NAME OF THE BUSINESS;
- (2) ITS PRINCIPAL OFFICE OR ADDRESS;
- (3) THE OWNER(S); AND
- (4) THE SERVICES OR GOODS THAT IT MAY PROVIDE OR SUPPLY AND THE VALUE OF THE GOODS OR SERVICES PROCURED FROM THE BUSINESSES INCLUDED ON SUPPLIER'S LIST.

(D) TO THE EXTENT THAT ANY FEDERAL OR STATE LAW, RULE, OR REGULATION WOULD REQUIRE THAT THIS SECTION BE MODIFIED OR VOIDED, THE PARTIES AGREE THAT SUCH PROVISION CAN BE AMENDED OR SEVERED FROM THE AGREEMENT WITHOUT AFFECTING ANY OF THE OTHER TERMS OF THE AGREEMENT.

2. ALL BID PRICES MUST BE TYPED OR WRITTEN IN INK. ANY CORRECTIONS, ERASURES OR OTHER FORMS OF ALTERATION TO UNIT PRICES SHOULD BE INITIALIZED BY THE BIDDER.

3. BID PRICES SHALL INCLUDE DELIVERY OF ALL ITEMS F.O.B. DESTINATION OR AS OTHERWISE PROVIDED. BIDS CONTAINING "PAYMENT IN ADVANCE" OR "C.O.D." REQUIREMENTS MAY BE REJECTED. PAYMENT IS TO BE MADE WITHIN 30 DAYS AFTER RECEIPT OF PROPERLY EXECUTED INVOICE OR DELIVERY, WHICHEVER IS LATER.

4. SPECIFY YOUR PAYMENT TERMS: _____ . CASH DISCOUNTS FOR LESS THAN 30 DAYS OR LESS THAN 1% WILL BE ACCEPTED, BUT WILL NOT BE CONSIDERED IN DETERMINING AWARDS

BY SIGNING THIS BID, THE BIDDER CERTIFIES:

* THAT NEITHER THIS BUSINESS ENTITY NOR ANY OF ITS EMPLOYEES OR SUBCONTRACTORS IS CURRENTLY LISTED AS EXCLUDED OR SANCTIONED BY EITHER THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, OFFICE OF INSPECTOR GENERAL (OIG) OR THE GENERAL SERVICES ADMINISTRATION (GSA).

* THAT IF THIS BUSINESS ENTITY OR ANY OF ITS EMPLOYEES OR SUBCONTRACTORS APPEAR ON EITHER LISTING, MY BID WILL BE REJECTED.

VENDOR PHONE NUMBER:	TITLE	DATE
FAX NUMBER:		
SIGNATURE OF AUTHORIZED BIDDER (MUST BE SIGNED)		NAME OF BIDDER (TYPED OR PRINTED)

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STANDARD TERMS & CONDITIONS

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BIDDER:

* THAT IF AT ANY TIME DURING THE TERM OF THE CONTRACT AWARDED AS A RESULT OF THIS INVITATION TO BID, THIS ENTITY OR ANY OF ITS EMPLOYEES OR SUBCONTRACTORS APPEARS ON EITHER LISTING, MY COMPANY WILL NOTIFY THE CONTRACTING AGENCY, AND THE CONTRACT WILL BE TERMINATED. THE CONTRACTING AGENCY WILL NOT BE LIABLE FOR ANY DAMAGES RESULTING FROM SAID TERMINATION.

THE BIDDER FURTHER CERTIFIES:

- * COMPLIANCE WITH ALL INSTRUCTIONS TO BIDDERS, TERMS, CONDITIONS, AND SPECIFICATIONS.
- * THIS BID IS MADE WITHOUT COLLUSION OR FRAUD.
- * THAT ALL TAXES DULY ASSESSED BY THE STATE OF LOUISIANA AND IT'S SUBDIVISIONS, INCLUDING FRANCHISE TAXES, PRIVILEGE TAXES, SALES TAXES AND ALL OTHER TAXES FOR WHICH THE FIRM IS LIABLE HAVE BEEN PAID.
- * THAT IF MY BID IS ACCEPTED WITHIN _____ DAYS FROM BID CLOSING TIME, MY FIRM WILL FURNISH ANY OR ALL OF THE ITEMS (OR SECTIONS) AT THE PRICE OPPOSITE EACH ITEM (OR SECTION).
- * DELIVERY WILL BE MADE WITHIN _____ DAYS AFTER RECEIPT OF ORDER.

5. DESIRED DELIVERY: 10 DAYS ARO, UNLESS SPECIFIED ELSEWHERE
6. TO ASSURE CONSIDERATION OF YOUR BID, SEE HEADER FOR RETURN INSTRUCTIONS. ALL BIDS AND ADDENDA SHOULD BE RETURNED IN AN ENVELOPE OR PACKAGE AND CLEARLY ENDORSED WITH THE BID NUMBER, BID OPENING DATE AND, BID OPENING TIME. REQUEST FOR QUOTATIONS AND ADDENDA SHOULD BE SUBMITTED VIA FAX, EMAIL OR PLACED IN AN ENVELOPE AND DELIVERED.
7. BIDS SUBMITTED ARE SUBJECT TO PROVISIONS OF THE LAWS OF THE STATE OF LOUISIANA INCLUDING BUT NOT LIMITED TO L.R.S. 39:1551-1736; PURCHASING RULES AND REGULATIONS; EXECUTIVE ORDERS; STANDARD TERMS AND CONDITIONS; SPECIAL CONDITIONS; AND SPECIFICATIONS LISTED IN THIS SOLICITATION.
PROHIBITION OF DISCRIMINATORY BOYCOTTS OF ISRAEL:
IN ACCORDANCE WITH EXECUTIVE ORDER NUMBER JBE 2018-15, EFFECTIVE MAY 22, 2018, FOR ANY CONTRACT FOR \$100,000 OR MORE AND FOR ANY CONTRACTOR WITH FIVE OR MORE EMPLOYEES, CONTRACTOR, OR ANY SUBCONTRACTOR, SHALL CERTIFY IT IS NOT ENGAGING IN A BOYCOTT OF ISRAEL, AND SHALL, FOR THE DURATION OF THIS CONTRACT, REFRAIN FROM A BOYCOTT OF ISRAEL. THE STATE RESERVES THE RIGHT TO TERMINATE THIS CONTRACT IF THE CONTRACTOR, OR ANY SUBCONTRACTOR, ENGAGES IN A BOYCOTT OF ISRAEL DURING THE TERM OF THE CONTRACT.
8. IMPORTANT: THIS BID IS TO BE MANUALLY SIGNED IN INK BY A PERSON AUTHORIZED TO BIND THE VENDOR (SEE NO.31).
9. INQUIRIES: ADDRESS ALL INQUIRIES AND CORRESPONDENCE TO THE BUYER AT THE PHONE NUMBER AND ADDRESS SHOWN ABOVE.
10. BID FORMS: ALL WRITTEN BIDS, UNLESS OTHERWISE PROVIDED FOR, SHOULD BE SUBMITTED ON, AND IN ACCORDANCE WITH FORMS PROVIDED, PROPERLY SIGNED (SEE #31). BIDS MUST BE RECEIVED AT THE ADDRESS SPECIFIED IN THE SOLICITATION PRIOR TO BID OPENING TIME IN ORDER TO BE CONSIDERED.
11. STANDARDS OR QUALITY. ANY PRODUCT OR SERVICE BID SHALL CONFORM TO ALL APPLICABLE FEDERAL AND STATE LAWS AND REGULATIONS AND THE SPECIFICATIONS CONTAINED IN THE SOLICITATION. UNLESS OTHERWISE SPECIFIED IN THE SOLICITATION, ANY MANUFACTURER'S NAME, TRADE NAME, BRAND NAME, OR CATALOG NUMBER USED IN THE SPECIFICATION IS FOR THE PURPOSE OF DESCRIBING THE STANDARD OF QUALITY, PERFORMANCE, AND CHARACTERISTICS DESIRED AND IS NOT INTENDED TO LIMIT OR RESTRICT COMPETITION. BIDDER MUST SPECIFY THE BRAND AND MODEL NUMBER OF THE PRODUCT OFFERED IN HIS/HER BID. BIDS NOT SPECIFYING BRAND AND MODEL NUMBER SHALL BE CONSIDERED AS OFFERING THE EXACT PRODUCTS SPECIFIED IN THE SOLICITATION.
12. DESCRIPTIVE INFORMATION. BIDDERS PROPOSING AN EQUIVALENT BRAND OR MODEL SHOULD SUBMIT WITH THE BID, INFORMATION (SUCH AS ILLUSTRATIONS, DESCRIPTIVE LITERATURE, TECHNICAL DATA) SUFFICIENT FOR LSUHSC TO EVALUATE QUALITY, SUITABILITY, AND COMPLIANCE WITH THE SPECIFICATIONS IN THE SOLICITATION. FAILURE TO

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BIDDER:

SUBMIT DESCRIPTIVE INFORMATION MAY CAUSE BID TO BE REJECTED. ANY CHANGE MADE TO A MANUFACTURER'S PUBLISHED SPECIFICATION SUBMITTED FOR A PRODUCT SHALL BE VERIFIABLE BY THE MANUFACTURER. IF ITEM(S) BID DO NOT FULLY COMPLY WITH SPECIFICATIONS (INCLUDING BRAND AND/OR PRODUCT NUMBER), BIDDER MUST STATE IN WHAT RESPECT ITEMS(S) DEVIATE. FAILURE TO NOTE EXCEPTIONS ON THE BID FORM WILL NOT RELIEVE THE SUCCESSFUL BIDDER(S) FROM SUPPLYING THE ACTUAL PRODUCTS REQUESTED.

13. BID OPENING. BIDDERS MAY ATTEND THE BID OPENING, BUT NO INFORMATION OR OPINIONS CONCERNING THE ULTIMATE CONTRACT AWARD WILL BE GIVEN AT THE BID OPENING OR DURING THE EVALUATION PROCESS. BIDS MAY BE EXAMINED WITHIN 72 HOURS AFTER BID OPENING. INFORMATION PERTAINING TO COMPLETED FILES MAY BE SECURED BY VISITING LSUHSC DURING NORMAL WORKING HOURS. WRITTEN BID TABULATIONS WILL NOT BE FURNISHED.
14. AWARDS. AWARD WILL BE MADE TO THE LOWEST RESPONSIBLE AND RESPONSIVE BIDDER. LSUHSC RESERVES THE RIGHT TO AWARD ITEMS SEPARATELY, GROUP, OR IN TOTAL, AND TO REJECT ANY OR ALL BIDS AND WAIVE ANY INFORMALITIES.
15. PRICES. UNLESS OTHERWISE SPECIFIED BY LSUHSC IN THE SOLICITATION, BID PRICES MUST BE COMPLETE, INCLUDING TRANSPORTATION PREPAID BY BIDDER TO DESTINATION AND FIRM FOR ACCEPTANCE FOR A MINIMUM OF 30 DAYS. IF ACCEPTED, PRICES MUST BE FIRM FOR THE CONTRACTUAL PERIOD. BIDS OTHER THAN F.O.B. DESTINATION MAY BE REJECTED. PRICES SHOULD BE QUOTED IN THE UNIT (EACH, BOX, CASE, ETC.) AS SPECIFIED IN THE SOLICITATION.
16. DELIVERIES. BIDS MAY BE REJECTED IF THE DELIVERY TIME INDICATED IS LONGER THAN THAT SPECIFIED IN THE SOLICITATION.
17. TAXES. VENDOR IS RESPONSIBLE FOR INCLUDING ALL APPLICABLE TAXES IN THE BID PRICE. LSUHSC AGENCIES ARE EXEMPT FROM ALL STATE AND LOCAL SALES AND USE TAXES.
18. NEW PRODUCTS. UNLESS SPECIFICALLY CALLED FOR IN THE SOLICITATION, ALL PRODUCTS FOR PURCHASE MUST BE NEW, NEVER PREVIOUSLY USED, AND THE CURRENT MODEL AND/OR PACKAGING. NO REMANUFACTURED, DEMONSTRATOR, USED OR IRREGULAR PRODUCT WILL BE CONSIDERED FOR PURCHASE UNLESS OTHERWISE SPECIFIED IN THE SOLICITATION. THE MANUFACTURER'S STANDARD WARRANTY WILL APPLY UNLESS OTHERWISE SPECIFIED IN THE SOLICITATION.
19. CONTRACT RENEWALS. UPON AGREEMENT OF LSU HCS D AND THE CONTRACTOR, A TERM CONTRACT MAY BE EXTENDED FOR ADDITIONAL 12 MONTH PERIODS AT THE SAME PRICES, TERMS AND CONDITIONS. IN SUCH CASES, THE TOTAL CONTRACT TERM CANNOT EXCEED 60 MONTHS. RS 39:1615
20. CONTRACT CANCELLATION. THE STATE OF LOUISIANA HAS THE RIGHT TO CANCEL ANY CONTRACT, IN ACCORDANCE WITH PURCHASING RULES AND REGULATIONS, FOR CAUSE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
 - (1) FAILURE TO DELIVER WITHIN THE TIME SPECIFIED IN THE CONTRACT;
 - (2) FAILURE OF THE PRODUCT OR SERVICE TO MEET SPECIFICATIONS, CONFORM TO SAMPLE QUALITY OR TO BE DELIVERED IN GOOD CONDITION;
 - (3) MISREPRESENTATION BY THE CONTRACTOR;
 - (4) FRAUD, COLLUSION CONSPIRACY OR OTHER UNLAWFUL MEANS OF OBTAINING ANY CONTRACT WITH THE STATE;
 - (5) CONFLICT OF CONTRACT PROVISIONS WITH CONSTITUTIONAL OR STATUTORY PROVISIONS OF STATE OR FEDERAL LAW;
 - (6) ANY OTHER BREACH OF CONTRACT.
21. DEFAULT OF CONTRACT. FAILURE TO DELIVER WITHIN THE TIME SPECIFIED IN THE BID WILL CONSTITUTE A DEFAULT AND MAY CAUSE CANCELLATION OF THE CONTRACT. WHERE THE UNIVERSITY HAS DETERMINED THE CONTRACTOR TO BE IN DEFAULT, THE UNIVERSITY RESERVES THE RIGHT TO PURCHASE ANY OR ALL PRODUCTS OR SERVICES COVERED BY THE CONTRACT ON THE OPEN MARKET AND TO CHARGE THE CONTRACTOR WITH COST IN EXCESS OF THE CONTRACT PRICE. UNTIL SUCH ASSESSED CHARGES HAVE BEEN PAID, NO SUBSEQUENT BID FROM THE DEFAULTING CONTRACTOR WILL BE CONSIDERED.
22. ORDER OF PRIORITY. IN THE EVENT THERE IS A CONFLICT BETWEEN THE INSTRUCTIONS TO BIDDERS OR STANDARD CONDITIONS AND THE SPECIAL CONDITIONS, THE SPECIAL CONDITIONS SHALL GOVERN.
23. APPLICABLE LAW. ALL CONTRACTS SHALL BE CONSTRUED IN ACCORDANCE WITH AND GOVERNED BY THE LAWS OF THE STATE OF LOUISIANA.
24. COMPLIANCE WITH CIVIL RIGHTS LAWS BY SUBMITTING AND SIGNING THIS BID, BIDDER AGREES TO ABIDE BY THE

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BIDDER:

REQUIREMENTS OF THE FOLLOWING AS APPLICABLE: TITLE VI AND VII OF THE CIVIL RIGHTS ACT OF 1964, AS AMENDED BY THE EQUAL OPPORTUNITY ACT OF 1972, FEDERAL EXECUTIVE ORDER 11246, FEDERAL REHABILITATION ACT OF 1973, AS AMENDED, THE VETERAN'S READJUSTMENT ASSISTANCE ACT OF 1974, TITLE IX OF THE EDUCATION AMENDMENTS OF 1972, THE AGE ACT OF 1975, AND BIDDER AGREES TO ABIDE BY THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT OF 1990. BIDDER AGREES NOT TO DISCRIMINATE IN ITS EMPLOYMENT PRACTICES AND WILL RENDER SERVICES UNDER ANY CONTRACT ENTERED INTO AS A RESULT OF THIS SOLICITATION WITHOUT REGARD TO RACE, COLOR, RELIGION, SEX, AGE, NATIONAL ORIGIN, POLITICAL AFFILIATION, DISABILITY, VETERAN STATUS, OR ANY OTHER NON-MERIT FACTOR. ANY ACT OF DISCRIMINATION COMMITTED BY BIDDER, OR FAILURE TO COMPLY WITH THESE STATUTORY OBLIGATIONS WHEN APPLICABLE, SHALL BE GROUNDS FOR TERMINATION OF ANY CONTRACT ENTERED INTO AS A RESULT OF THIS SOLICITATION.

25. SPECIAL ACCOMMODATIONS. ANY "QUALIFIED INDIVIDUAL WITH DISABILITY" AS DEFINED BY THE AMERICANS WITH DISABILITIES ACT WHO HAS SUBMITTED A BID AND DESIRES TO ATTEND THE BID OPENING, MUST NOTIFY THIS OFFICE IN WRITING NOT LATER THAN SEVEN DAYS PRIOR TO THE BID OPENING DATE OF THEIR NEED FOR SPECIAL ACCOMMODATIONS. IF THE REQUEST CANNOT BE REASONABLY PROVIDED, THE INDIVIDUAL WILL BE INFORMED PRIOR TO THE BID OPENING.
26. INDEMNITY. CONTRACTOR AGREES, UPON RECEIPT OF WRITTEN NOTICE OF A CLAIM OR ACTION, TO DEFEND THE CLAIM OR ACTION, OR TAKE OTHER APPROPRIATE MEASURE, TO INDEMNIFY, AND HOLD HARMLESS, LSUHSC, ITS OFFICERS, ITS AGENTS AND ITS EMPLOYEES FROM AND AGAINST ALL CLAIMS AND ACTIONS FOR BODILY INJURY, DEATH OR PROPERTY DAMAGES CAUSED BY THE FAULT OF THE CONTRACTOR, ITS OFFICERS, ITS AGENTS, OR ITS EMPLOYEES. CONTRACTOR IS OBLIGATED TO INDEMNIFY ONLY TO THE EXTENT OF THE FAULT OF THE CONTRACTOR, ITS OFFICERS, ITS AGENTS, OR ITS EMPLOYEES. HOWEVER, THE CONTRACTOR SHALL HAVE NO OBLIGATION AS SET FORTH ABOVE WITH RESPECT TO ANY CLAIM OR ACTION FROM BODILY INJURY, DEATH OR PROPERTY DAMAGES ARISING OUT OF THE FAULT OF THE UNIVERSITY, ITS OFFICERS, ITS AGENTS OR ITS EMPLOYEES.
27. INTERPRETATION OF DOCUMENT: ANY INTERPRETATION OF THE BID OR QUOTATION DOCUMENT WILL ONLY BE MADE BY AN ADDENDUM ISSUED IN WRITING BY THE PURCHASING DEPARTMENT. SUCH ADDENDUM WILL BE MAILED OR DELIVERED TO EACH PERSON RECEIVING A SET OF THE ORIGINAL BID OR QUOTATION DOCUMENTS. LSUHSC WILL NOT BE RESPONSIBLE FOR ANY OTHER EXPLANATION OR INTERPRETATION OF THE DOCUMENTS.
28. ACCEPTANCE OF BID: ONLY THE ISSUANCE OF A PURCHASE ORDER OR A SIGNED CONTRACT CONSTITUTES ACCEPTANCE ON THE PART OF LSUHSC.
29. ADHERENCE TO JCAHO STANDARDS: WHERE APPLICABLE, LSUHSC IS ACCREDITED BY THE JOINT COMMISSION ON ACCREDITATION OF HEALTHCARE ORGANIZATIONS AND AS SUCH ALL CONTRACTORS, SUBCONTRACTORS, AND VENDORS AGREE TO ADHERE TO THE APPLICABLE STANDARDS PROMULGATED BY THE COMMISSION.
30. PREFERENCE: IN ACCORDANCE WITH LOUISIANA REVISED STATUTES 39:1595, A PREFERENCE MAY BE ALLOWED FOR PRODUCTS MANUFACTURED, PRODUCED, GROWN, OR ASSEMBLED IN LOUISIANA OF EQUAL QUALITY.
DO YOU CLAIM THIS PREFERENCE? YES _____ NO _____
SPECIFY THE LINE NUMBER (S) _____
SPECIFY LOCATION WITHIN LOUISIANA WHERE THIS PRODUCT IS MANUFACTURED, PRODUCED,
GROWN OR ASSEMBLED _____
(NOTE: IF MORE SPACE IS REQUIRED, INCLUDE ON SEPARATE SHEET.)
DO YOU HAVE A LOUISIANA BUSINESS WORK FORCE? YES _____ NO _____
IF SO, DO YOU CERTIFY THAT AT LEAST FIFTY PERCENT (50%) OF YOUR LOUISIANA WORKFORCE IS
COMPRISED OF LOUISIANA RESIDENTS? YES _____ NO _____
FAILURE TO SPECIFY ABOVE INFORMATION MAY CAUSE ELIMINATION FROM PREFERENCES.
PREFERENCES SHALL NOT APPLY TO SERVICE CONTRACTS.
31. SIGNATURE AUTHORITY. IN ACCORDANCE WITH L.R.S. 39:1594 (ACT 121), THE PERSON SIGNING THE BID MUST BE:
31.1.A CURRENT CORPORATE OFFICER, PARTNERSHIP MEMBER OR OTHER INDIVIDUAL SPECIFICALLY AUTHORIZED TO SUBMIT

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BIDDER:

A BID AS REFLECTED IN THE APPROPRIATE RECORDS ON FILE WITH THE SECRETARY OF STATE;

OR

31.2. AN INDIVIDUAL AUTHORIZED TO BIND THE VENDOR AS REFLECTED BY AN ACCOMPANYING CORPORATE RESOLUTION, CERTIFICATE OR AFFIDAVIT;

OR

31.3. AN INDIVIDUAL LISTED ON THE STATE OF LOUISIANA BIDDER'S APPLICATION AS AUTHORIZED TO EXECUTE BIDS. BY SIGNING THE BID, THE BIDDER CERTIFIES COMPLIANCE WITH THE ABOVE.

32. CODE OF CONDUCT

32.1. THE CODE OF CONDUCT OF THE LSU HEALTH SCIENCES CENTER - HEALTH CARE SERVICES DIVISION (HCSD) PROVIDES THE GUIDING STANDARDS FOR OUR DECISIONS AND ACTIONS AS MEMBERS OF THE HCSD. ALTHOUGH THE CODE CAN NEITHER COVER EVERY SITUATION IN THE DAILY CONDUCT OF OUR VARIED ACTIVITIES, NOR SUBSTITUTE FOR COMMON SENSE, INDIVIDUAL JUDGMENT OR PERSONAL INTEGRITY; IT IS THE DUTY OF EACH OFFICER, DIRECTOR, EMPLOYEE, LEASED EMPLOYEE, STUDENT AND AGENT ("PERSONNEL") OF THE HCSD TO ADHERE, WITHOUT EXCEPTION, TO THE PRINCIPLES SET FORTH HEREIN. ALL PERSONNEL OF THE HCSD ARE SUBJECT TO AND SHALL COMPLY WITH THE TERMS OF THIS CODE OF CONDUCT.

32.2. HCSD PERSONNEL, AS DEFINED ABOVE, SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL LAWS, REGULATIONS, AND HCSD POLICIES. THIS INCLUDES, BUT IS NOT LIMITED TO, COMPLIANCE WITH THE HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPPA) PERTAINING TO PRIVACY AND INFORMATION SECURITY, AS WELL AS, THE DEFICIT REDUCTION ACT OF 2005 PERTAINING TO THE DETECTION AND PREVENTION OF FRAUD WASTE AND ABUSE AND RIGHTS OF EMPLOYEES TO BE PROTECTED AS WHISTLEBLOWERS UNDER THE FALSE CLAIMS ACT.

32.3. HCSD PERSONNEL SHALL CONDUCT ALL ACTIVITIES IN ACCORDANCE WITH THE HIGHEST ETHICAL STANDARDS OF THE STATE, THE COMMUNITY, AND THEIR RESPECTIVE PROFESSIONS, IN A MANNER THAT UPHOLDS HCSD'S REPUTATION AND STANDING.

32.4. HCSD PERSONNEL HAVE A DUTY TO AVOID CONFLICTS OF INTEREST AND MAY NOT USE THEIR POSITIONS OR AFFILIATION WITH THE HCSD FOR PERSONAL BENEFIT.

32.5. HCSD PERSONNEL SHALL STRIVE TO ATTAIN THE HIGHEST STANDARD OF PATIENT CARE AS STATED IN THE HCSD MISSION.

32.6. THE HCSD SHALL PROVIDE EQUAL OPPORTUNITY AND PERSONNEL SHALL RESPECT THE DIGNITY OF ALL PATIENTS AND PERSONNEL.

32.7. HCSD PERSONNEL MUST UPHOLD THE HIGHEST MORAL AND ETHICAL STANDARDS IN EDUCATION OF HEALTH PROFESSIONALS AND HEALTH RELATED RESEARCH.

32.8. HCSD PERSONNEL SHALL MAINTAIN PROPER ACCURATE AND COMPLETE RECORDS AND A RELATIONSHIP OF INTEGRITY WITH ALL PAYOR SOURCES.

32.9. ALL BUSINESS PRACTICES OF THE HCSD AND ITS PERSONNEL SHALL BE CONDUCTED WITH HONESTY AND INTEGRITY.

32.10. HCSD SHALL HAVE PROPER REGARD FOR HEALTH AND SAFETY FOR ITS PERSONNEL AND PATIENTS.

32.11. THE CODE OF CONDUCT IS THE FUNDAMENTAL BASIS FOR THE OPERATION AND ACTIVITIES OF THE HCSD.

32.12. HOW TO REPORT A SUSPECTED VIOLATION OF THE CODE A SUSPECTED VIOLATION OF THE CODE OF CONDUCT MAY BE REPORTED WITH ALL PERTINENT INFORMATION TO YOUR IMMEDIATE SUPERVISOR. SUCH MATTERS MAY ALSO BE REPORTED DIRECTLY TO THE COMPLIANCE DEPARTMENT. IN EITHER CASE, THIS REPORTING MAY BE DONE WITHOUT FEAR OF RETALIATION.

HCSD COMPLIANCE OFFICE 225-922-0572

COMPLIANCE ACCESS LINE AT 1- 800-735-1185.

32.13. REPORTS TO THE COMPLIANCE OFFICE OR ACCESS LINE MAY BE ANONYMOUS AND WILL BE MAINTAINED ON A CONFIDENTIAL BASIS AS ALLOWED BY LAW.

32.14. VIEW THE ENTIRE HCSD CODE OF CONDUCT AT [HTTP://WWW.LSUOHOSPITALS.ORG/POLICIES/PUBLIC/DEFAULT.ASP](http://www.lsuohospitals.org/policies/public/default.asp) FROM THE RIGHT SIDE OF THE PAGE CLICK ON 8500 COMPLIANCE AND THEN 8501-07 CODE OF CONDUCT.

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BIDDER:

33. CORPORATE BUSINESS INTEREST

33.1. ALL VENDORS AND/OR BIDDERS SHALL BE REQUIRED TO PROVIDE INFORMATION REGARDING VENDOR AND/OR BIDDER'S BUSINESS STRUCTURE, MEMBERS, OR THOSE WITH A FINANCIAL INTEREST IN VENDOR AND/OR BIDDER'S BUSINESS SHOULD THAT INFORMATION BE REQUESTED BY LSUHCS. ANY FAILURE BY VENDOR AND/OR BIDDER TO PROVIDE THE REQUESTED INFORMATION MAY BE CAUSE TO TERMINATE THE CONTRACT OR TO CONSIDER THE BID AS NONRESPONSIVE. THIS INFORMATION SHOULD BE SUBMITTED WITH BID; IF NOT SUBMITTED WITH BID, IT MUST BE SUBMITTED WITHIN 3 DAYS OF REQUEST OR BID MAY BE REJECTED. ADDITIONALLY, VENDOR AND/OR BIDDER SHALL UPDATE THIS INFORMATION SHOULD THERE BE ANY CHANGE IN THE CORPORATE STRUCTURE AND/OR OWNERSHIP OF VENDOR AND/OR BIDDER'S COMPANY.

33.2. VENDORS AND/OR BIDDERS SHALL DO THEIR BEST TO PREVENT ANY CONFLICTED RELATIONSHIPS OR CONFLICTS OF INTEREST WITH LSUHCS PERSONNEL IN CONNECTION WITH THIS BID. FURTHER, VENDORS AND/OR BIDDERS SHALL NOT USE ANY EXISTING CONFLICTED PERSONAL RELATIONSHIPS WITH LSUHCS PERSONNEL AS AN ADVANTAGE IN THE BID OF AND/OR AWARD OF THIS CONTRACT.

33.3. THE CODE OF CONDUCT CONTAINED IN THE INVITATION TO BID SHALL BE APPLICABLE TO VENDOR AND/OR BIDDER, ITS EMPLOYEES, CONTRACTORS, SUBCONTRACTORS, AND THEIR EMPLOYEES AS IF THEY WERE EMPLOYEES OF LSUHCS.

WHEN APPLICABLE, AND IF NECESSARY TO COMPLY WITH THE HIPAA PRIVACY RULE, THE SUCCESSFUL VENDOR WILL BE REQUIRED TO EXECUTE OUR BUSINESS ASSOCIATE ADDENDUM, WHICH MUST BE RETURNED WITHIN TEN (10) DAYS AFTER REQUEST, WHEN REQUESTED.

A SAMPLE OF OUR CURRENT BUSINESS ASSOCIATE ADDENDUM CAN BE FOUND ON THE HCS WEB SITE AT: [HTTP://WEBDEV.LSUHSC.EDU/HCSD/HIPAA/](http://webdev.lsuhs.edu/hcsd/hipaa/).

34. AUDIT OF RECORDS: THE STATE LEGISLATIVE AUDITOR, FEDERAL AUDITORS, AND INTERNAL AUDITORS OF THE STATE SHALL HAVE THE RIGHT TO INSPECT AND AUDIT ALL TIMEKEEPING AND EXPENSE RECORDS OF THE CONTRACTING ENTITY OR ANY SUBCONTRACTOR OF THE CONTRACTING ENTITY TO SUBSTANTIATE AMOUNTS INVOICED BY SUPPLIER WITH RESPECT TO THIS AGREEMENT. THE RIGHTS OF INSPECTION AND AUDIT SHALL COMMENCE AS OF THE DATE OF THIS AGREEMENT AND SHALL CONTINUE FOR A PERIOD OF FIVE (5) YEARS AFTER PROJECT ACCEPTANCE OR AS REQUIRED BY APPLICABLE STATE AND FEDERAL LAW. THE CONTRACTING ENTITY AND ANY SUBCONTRACTOR OF THE CONTRACTING ENTITY SHALL MAINTAIN ALL TIMEKEEPING AND EXPENSE RECORDS RELATED TO THIS AGREEMENT FOR THE ENUMERATED FIVE (5) YEAR PERIOD.

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PRICE SHEET

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UNLESS SPECIFIED ELSEWHERE SHIP TO:

52579 Highway 51 South
Independence LA 70443

Line No.	Description	Qty	UOM	Unit Price	Extended Amount
1	<p>HVAC MODIFICATIONS TO CENTRAL SUPPLY Specify brand, model bid(if applicable)</p> <hr style="width: 30%; margin-left: 0;"/> <p>COMPLETE BID RULES IN ATTACHED DOCUMENT. *****</p> <p>COMPLETE BID DOCUMENTS FOR THIS PROJECT MAY BE OBTAINED WITHOUT CHARGE FROM HOWELL CONSULTANTS @ 985-626-9305 OR LALLIE KEMP MEDICAL CENTER PURCHASING DEPARTMENT@ 985-878-1472 *****</p> <p>MANDATORY PRE-BID CONFERENCE WILL BE HELD @ 10:00AM THURSDAY NOVEMBER 3, 2020 IN THE LARGE CONFERENCE ROOM AT:</p> <p>LALLIE KEMP MEDICAL CENTER, 52579 HIGHWAY 51 SOUTH INDEPENDENCE, LA 70443</p> <p>ALL QUESTIONS WILL BE ANSWERED AT THE PRE-BID CONFERENCE.</p>	1.00	EA		

SPECIFICATION

FOR

HVAC MODIFICATIONS TO CENTRAL SUPPLY

AT

**LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA**

**HC Project No. 19003
October 8, 2020**

HVAC MODIFICATIONS TO CENTRAL SUPPLY
FOR
LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA

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BID FORM
BID BOND
SAMPLE CONTRACT BETWEEN OWNER AND CONTRACTOR
ATTESTATIONS AFFIDAVIT

DIVISION 1 - GENERAL REQUIREMENTS

011000 SUMMARY
011300 PRE-BID SUBSTITUTION PROCEDURES
013100 PROJECT MANAGEMENT AND COORDINATION
013300 SUBMITTAL PROCEDURES
014200 REFERENCES
015000 TEMPORARY FACILITIES AND CONTROLS
016000 PRODUCT REQUIREMENTS
017300 EXECUTION
017700 CLOSEOUT PROCEDURES
017823 OPERATION AND MAINTENANCE DATA
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DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING

230010 MECHANICAL GENERAL PROVISIONS
236000 HVAC SYSTEMS
236020 COOLING TOWER
236030 HYDRONIC PUMPS
236950 TEMPERATURE CONTROLS

END OF SECTION 000010

ADVERTISEMENT FOR BIDS

Sealed bids will be received at the Lallie Kemp Regional Medical Center, Administration Office, Independence, Louisiana until 10:00 A.M. , Thursday, November 19, 2020 .

FOR: **HVAC Modifications to Central Supply
Lallie Kemp Regional Medical Center
Independence, Louisiana**

USE ONE OF THE FOLLOWING PARAGRAPHS

Complete Bid Documents may be obtained from:

**Howell Consultants, LLC
360 Mapleridge Drive
Mandeville, LA 70471
Telephone: 985-626-9305**

Complete Bid Documents for this project are available in electronic form. They may be obtained without charge and without deposit from **Howell Consultants, LLC**. Plan holders are responsible for their own reproduction costs. Questions about this procedure shall be directed to the Designer at: PHONE: 985-626-9305

The successful Bidder shall be required to furnish a Performance and Payment Bond written as described in the Instructions to Bidders included in the Bid Documents for this project.

A PRE-BID CONFERENCE WILL BE HELD
at 10:00 AM on Thursday , Nov. 3, 2020 at LKPMC

Bids shall be accepted from Contractors who are licensed under LA. R.S. 37:2150-2192 for the classification of **Mechanical Work**. Bidder is required to comply with provisions and requirements of LA R.S. 38:2212(B)(5). No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LA. R.S. 38:2214.

The Owner reserves the right to reject any and all bids for just cause. In accordance with La. R.S. 38:2212(B)(1), the provisions and requirements of this Section; and those stated in the bidding documents shall not be waived by any entity.

INSTRUCTIONS TO BIDDERS

COMPLETION TIME:

The Bidder shall agree to fully complete the contract within (120) consecutive calendar days, subject to such extensions as may be granted to the contract by the owner and acknowledges that this construction time will start on or before the date specified in the written "Notice to Proceed" from the Owner.

LIQUIDATED DAMAGES:

The Bidder shall agree to pay as Liquidated Damages the amount of Three Hundred Dollars (\$300.00) for each consecutive calendar day for which the work is not complete, beginning with the first day beyond the contract completion date stated on the "Notice to Proceed" or as amended by change order.

BID FORM

TO: Lallie Kemp Regional Medical Center
Division of Administration

BID FOR: Hvac Modifications to Central Supply at
Lallie Kemp Regional Medical Center
Independence, La.

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Howell Consultants, LLC and dated: October 8, 2020

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____.

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____ Dollars (\$ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:

Not Applicable Dollars (\$ _____)

NAME OF BIDDER: _____

ADDRESS OF BIDDER: _____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

A CORPORATE RESOLUTION OR WRITTEN EVIDENCE of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.

BID BOND
FOR
LALLIE KEMP REGIONAL MEDICAL CENTER PROJECTS

Date: _____

KNOW ALL MEN BY THESE PRESENTS:

That _____ of _____, as Principal, and _____, as Surety, are held and firmly bound unto the Lallie Kemp Regional Medical Center (Obligee), in the full and just sum of five (5%) percent of the total amount of this proposal, including all alternates, lawful money of the United States, for payment of which sum, well and truly be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

Surety represents that it is listed on the current U. S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater that the amount for which it obligates itself in this instrument or that it is a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A. M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the Bond amount may not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide.

Surety further represents that it is licensed to do business in the State of Louisiana and that this Bond is signed by surety's agent or attorney-in-fact. This Bid Bond is accompanied by appropriate power of attorney.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas said Principal is herewith submitting its proposal to the Obligee on a Contract for:

NOW, THEREFORE, if the said Contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the Contract in writing and give a good and sufficient bond to secure the performance of the terms and conditions of the Contract with surety acceptable to the Obligee, then this obligation shall be void; otherwise this obligation shall become due and payable.

PRINCIPAL (BIDDER)

SURETY

BY: _____
AUTHORIZED OFFICER-OWNER-PARTNER

BY: _____
AGENT OR ATTORNEY-IN-FACT(SEAL)

FOR INFORMATION ONLY

STATE OF LOUISIANA
PARISH OF «PARISH OF PROJECT»

CONTRACT BETWEEN OWNER AND CONTRACTOR AND PERFORMANCE AND PAYMENT BOND

This agreement entered into this _____ day of _____, 2020, by «Contractor» hereinafter called the "Contractor", whose business address is «Contractor Address», «Contractor City», «Contractor State» «Contractor Zip», and the State of Louisiana Division of Administration, herein represented by the contracting officer executing this contract, hereinafter called the "Owner".

Witnesseth that the Contractor and the Owner, in consideration of premises and the mutual covenants; consideration and agreement herein contained, agree as follows:

Statement of Work: The contractor shall furnish all labor and materials and perform all of the work required to build, construct and complete in a thorough and workmanlike manner:

«Project_Reference_1»
«Project_Reference_2»
«Project_Reference_3»
«Project_City», Louisiana
Project No.: «ProjectNo», «Part_No»«WBS»;
«Supplement_Project_No», Part «Supplement_Part_No»
(«Supplement_WBS»)(Supplement)
State ID No.: «StateID» Site Code: «SiteCode»

in strict accordance with Contract Documents prepared by:

«Designer»
«Designer_Address»
«Designer_City», «Designer_State» «Designer_Zip»

It is recognized by the parties herein that said Contract Documents including by way of example and not of limitation, the Drawings and Specifications dated «Drawings and Specs Date», Addenda number(s) «Addenda No», the Instruction to Bidders, Bid Form, General Conditions, Supplementary Conditions, any Addenda thereto, impose duties and obligations upon the parties herein, and said parties thereby agree that they shall be bound by said duties and obligations. For these purposes, all of the provisions contained in the aforementioned Construction Documents are incorporated herein by reference with the same force and effect as though said Construction Documents were herein set out in full.

Time for Completion: The work shall be commenced on a date to be specified in a written order of the Owner and shall be completed within «Time Completion Days» («Time Completion Days») consecutive calendar days from and after the said date.

Liquidated Damages: Contractor shall be assessed Liquidated Damages in the amount of «Liquidated Damages Cost Per Day» per day for each consecutive calendar day which work is not complete beginning with the first day beyond the completion time.

Compensation to be paid to the Contractor: The Owner will pay and the Contractor will accept in full consideration for the performance of the contract the sum of «Contract Amount Words» and No/100 Dollars («Contract Amount Numeral)» which sum represents the «Base Bid Only or Plus Alternates»

Taxes: Contractor hereby agrees that the responsibility for payment of taxes from the funds thus received under this Contract and/or legislative appropriation shall be contractor's obligation and identified under Federal tax identification number _____.

Performance and Payment Bond: To these presents personally came and intervened _____, herein acting for _____, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business in the State of Louisiana, as surety, who declared that having taken cognizance of this contract and of the Construction Documents mentioned herein, he hereby in his capacity as its Attorney in Fact obligates his said company, as Surety for the said Contractor, unto the said Owner, up to the sum of **«Contract Amount Words» and No/100 Dollars («Contract Amount Numeral»)**. By issuance of this bond, the surety acknowledges they are in compliance with R.S. 38:2219.

The condition of this performance and payment bond shall be that should the Contractor herein not perform the contract in accordance with the terms and conditions hereof, or should said Contractor not fully indemnify and save harmless the Owner, from all cost and damages which he may suffer by said Contractor's non-performance or should said Contractor not pay all persons who have and fulfill obligations to perform labor and/or furnish materials in the prosecution of the work provided for herein, including by way of example workmen, laborers, mechanics, and furnishers of materials, machinery, equipment and fixtures, then said Surety agrees and is bound to so perform the contract and make said payment(s).

Provided, that any alterations which may be made in the terms of the contract or in the work to be done under it, or the giving by the Owner of any extensions of time for the performance of the contract, or any other forbearance on the part of either the Owner or the Contractor to the other shall not in any way release the Contractor or the Surety from their liability hereunder, notice to the Surety of any such alterations, extensions or other forbearance being hereby waived.

Contractor acknowledges and agrees to comply with the provisions of La. R.S. 38:2212.10 and federal law pertaining to E-Verify in the performance of services under this Contract.

It is hereby agreed that the Legislative Auditor of the State of Louisiana and/or the Office of the Governor, Division of Administration auditors shall have the option of auditing all accounts of contractor which relate to this contract.

The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the legislature. If the legislature fails to appropriate sufficient monies to provide for the continuation of the contract, or if such appropriation is reduced by the veto of the Governor or by any means provided in the appropriations act to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated.

The contractor agrees to abide by the requirements of the following as applicable: Title VI of the Civil Rights Act of 1964 and Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972, Federal Executive Order 11246 as amended, the Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, the Fair Housing Act of 1968 as amended, and contractor agrees to abide by the requirements of the Americans with Disabilities Act of 1990.

Contractor agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, disability, or age in any matter relating to employment. Any act of discrimination committed by Contractor, or failure to comply with these statutory obligations when applicable shall be grounds for termination of this contract.

In accordance with Executive Order Number JBE 2018-15, effective May 22, 2018, for any contract for \$100,000 or more and for any contractor with five or more employees, Contractor, or any Subcontractor, shall certify it is not engaging in a boycott of Israel, and shall, for the duration of this contract, refrain from a boycott of Israel. The State reserves the right to terminate this contract if the Contractor, or any Subcontractor, engages in a boycott of Israel during the term of the contract.

Contractor has a continuing obligation to disclose any suspensions or debarment by any government entity, including but not limited to General Services Administration (GSA). Failure to disclose may constitute grounds for suspension and/or termination of the Contract and debarment from future Contracts.

Contractor, and each tier of Subcontractors, shall certify that it is not on the List of Parties Excluded from Federal Procurement or Nonprocurement Programs promulgated in accordance with E.O.s 12549 and 12689, "Debarment and Suspension," as set forth at 24 CFR part 24.

In Witness whereof, the parties hereto on the day and year first above written have executed this agreement in six (6) counterparts, each of which shall, without proof or accountancy for the other counterparts, be deemed an original thereof.

THUS DONE AND SIGNED at Baton Rouge, Louisiana, on the day, month, and year first written above.

WITNESSES:

Lallie Kemp Regioonal Medical Center

Owner Witness #1 Sign Here

BY: _____
OWNER

Owner Witness #2 Sign Here

Contractor Witness #1 Sign Here

BY: _____
«CONTRACTOR»

Contractor Witness #2 Sign Here

SURETY:

Surety Witness #1 Sign Here

BY: _____
ATTORNEY IN FACT

Surety Witness #2 Sign Here

ADDRESS

TELEPHONE NUMBER

PROJECT NO.: 19003

NAME: HVAC Modifications for
Lallie Kemp Regional Medical Center

LOCATION: Independence, La.

NON-COLLUSION AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the State and Parish aforesaid, personally came and appeared _____ representing «Contractor» who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

PART I.

Section 2224 of Part II of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

(1) That affiant employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

(2) That no part of the Contract price received by affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the Contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for affiant.

PART II.

Section 2190 of Part I of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

That affiant, if an architect or engineer, or representative thereof, does not own a substantial financial interest, either directly or indirectly, in any corporation, firm, partnership, or other organization which supplies materials for the construction of a public work when the architect or engineer has performed architectural or engineering services, either directly or indirectly, in connection with the public work for which the materials are being supplied.

For the purposes of this Section, a "substantial financial interest" shall exclude any interest in stock being traded on the American Stock Exchange or the New York Stock Exchange.

That affiant, if subject to the provisions of this section, does hereby agree to be subject to the penalties involved for the violation of this section.

AFFIANT

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ DAY OF _____, 2020.

NOTARY

Name of Project

Project No.

STATE OF _____

PARISH OF _____

ATTESTATIONS AFFIDAVIT

Before me, the undersigned notary public, duly commissioned and qualified in and for the parish and state aforesaid, personally came and appeared Affiant, who after being duly sworn, attested as follows:

LA. R.S. 38:2227 PAST CRIMINAL CONVICTIONS OF BIDDERS

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes:

- (a) Public bribery (R.S. 14:118)
- (b) Corrupt influencing (R.S. 14:120)

- (c) Extortion (R.S. 14:66)
- (d) Money laundering (R.S. 14:230)

B. Within the past five years from the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named below has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

- (a) Theft (R.S. 14:67)
- (b) Identity Theft (R.S. 14:67.16)
- (c) Theft of a business record (R.S.14:67.20)
- (d) False accounting (R.S. 14:70)
- (e) Issuing worthless checks (R.S. 14:71)

- (f) Bank fraud (R.S. 14:71.1)
- (g) Forgery (R.S. 14:72)
- (h) Contractors; misapplication of payments (R.S. 14:202)
- (i) Malfeasance in office (R.S. 14:134)

LA. R.S. 38:2212.10 Verification of Employees

- A. At the time of bidding, Appearer is registered and participates in a status verification system to verify that all new hires in the state of Louisiana are legal citizens of the United States or are legal aliens.
- B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.
- C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

Name of Project

Project No.

LA. R.S. 23:1726(B) Certification Regarding Unpaid Workers Compensation Insurance

- A. R.S. 23:1726 prohibits any entity against whom an assessment under Part X of Chapter 11 of Title 23 of the Louisiana Revised Statutes of 1950 (Alternative Collection Procedures & Assessments) is in effect, and whose right to appeal that assessment is exhausted, from submitting a bid or proposal for or obtaining any contract pursuant to Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950 and Chapters 16 and 17 of Title 39 of the Louisiana Revised Statutes of 1950.
- B. By signing this bid /proposal, Affiant certifies that no such assessment is in effect against the bidding / proposing entity.

NAME OF BIDDER

NAME OF AUTHORIZED SIGNATORY OF BIDDER

DATE

TITLE OF AUTHORIZED SIGNATORY OF BIDDER

**SIGNATURE OF AUTHORIZED
SIGNATORY OF BIDDER/AFFIANT**

Sworn to and subscribed before me by Affiant on the ____ day of _____, 20__.

Notary Public

HVAC MODIFICATIONS TO CENTRAL SUPPLY
AT
LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Owner-furnished products.
- 4. Access to site.
- 5. Work restrictions.
- 6. Specification and drawing conventions.
- 7. Miscellaneous provisions.

B. Related Requirements:

- 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: HVAC modifications to central supply at Lallie Kemp Regional Medical Center

- 1. Project Location: Independence, La.

- B. Owner: State of Louisiana

- C. Engineer: Howell Consultants, LLC, 360 Mapleridge Drive, Mandeville, LA 70477.

- D. Engineer's Consultants: The Engineer has retained the following design professionals who have prepared designated portions of the Contract Documents:

- 1. Mechanical – Howell Consultants, LLC, 360 Mapleridge Drive, Mandeville, LA 70471
 - 2. Electrical – Creative Engineering Group, 201 Highland Park Plaza, Covington, LA 70433

HVAC MODIFICATIONS TO CENTRAL SUPPLY
AT
LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. The Project includes All work required to replace the existing HVAC system as indicated on the plans.
2. Scope of work shall be as indicated on the plans and as stated below:

All work required to replace the existing HVAC system as indicated on the plans.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. No mass burning of construction debris or trash shall be permitted.
2. Surrounding Public Streets, Driveways, Walkways and Entrances: Keep public streets, driveways and entrances serving neighboring premises clear and available to neighbors and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.6 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. Nonsmoking Facility: Any use of tobacco products is not permitted anywhere on the hospital site.

C. Controlled Substances: Use of controlled substances on Project site is not permitted.

HVAC MODIFICATIONS TO CENTRAL SUPPLY
AT
LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA

- D. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

HVAC MODIFICATIONS TO CENTRAL SUPPLY
AT
LALLIE KEMP REGIONAL MEDICAL CENTER
INDEPENDENCE, LOUISIANA

SECTION 002120 - PRE-BID SUBSTITUTION PROCEDURES

1.1 DEFINITIONS

- A. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contracting Documents, submitted prior to receipt of bids.
- B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 012500 "Post Bid Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 SUBSTITUTIONS

- A. Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.
- B. Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Engineer; otherwise requests will be returned without action:
 - 1. Extensive revisions to the Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
 - 3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

HVAC MODIFICATIONS TO CENTRAL SUPPLY
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- A. Substitution Request: Submit to Engineer. Substitution Request must be made in writing by prime contract Bidder only in compliance with the following requirements:
1. Requests for substitution of materials and equipment will be considered if received no later than 10 working days prior to date of bid opening.
 2. Submittal Format: Submit three copies of each written Substitution Request, using form bound in Project Manual. Submissions not accompanied by the forms included in this section shall not be considered.
 3. Submittal Format:
 - a. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specifications Sections and drawing numbers.
 - b. Provide complete documentation on both the product specified and the proposed substitute, including the following information as appropriate:
 - 1) Point-by-point comparison of specified and proposed substitute product data, fabrication drawings, and installation procedures.
 - 2) Copies of current, independent third-party test data of salient product or system characteristics.
 - 3) Samples where applicable or when requested by Engineer.
 - 4) Detailed comparison of significant qualities of the proposed substitute with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - 5) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - 6) Research reports, where applicable, evidencing compliance with building code in effect for Project.
 - 7) Coordination information, including a list of changes or modifications needed to other

HVAC MODIFICATIONS TO CENTRAL SUPPLY
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parts of the Work and to construction performed by Owner and separate contractors, which will become necessary to accommodate the proposed substitute.

- c. Provide certification by manufacturer that the substitute proposed is equal to or superior to that required by the Contracting Documents, and that its in-place performance will be equal to or superior to the product or equipment specified in the application indicated.
 - d. Bidder, in submitting the Substitution Request, waives the right to additional payment or an extension of Contract Time because of the failure of the substitute to perform as represented in the Substitution Request.
- B. Engineer's Action:
- 1. Engineer may request additional information or documentation necessary for evaluation of the Substitution Request. Engineer will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Contracting Documents.
- C. Engineer's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

HVAC MODIFICATIONS TO CENTRAL SUPPLY
AT
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INDEPENDENCE, LOUISIANA

To: Scott Howell, Project Manager
Howell Consultants, LLC
360 Mapleridge Drive
Mandeville, Louisiana 70471
Email: showell@howellconsultants.com

To be received by the Engineer 10 working days prior to Bid Opening Date.

We hereby submit for your consideration the following product instead of the specified item for the above project.

DRAWING NO. _____ DRAWING NAME _____

_____ SPEC SECT.	_____ SPEC NAME	_____ PARAGRAPH	_____ SPECIFIED ITEM
---------------------	--------------------	--------------------	-------------------------

Proposed Substitution: _____

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Submit with request necessary samples and substantiating data to prove equal quality and performance to which that is specified. Clearly mark manufacturer=s literature to indicate equality in performance.

The undersigned certifies that the function, appearance and quality are of equal performance and assumes liability for equal performance, equal design and compatibility with adjacent materials.

Submitted By:

Signature Title

Firm

Address

Telephone Date

Signature shall be by person having the authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

HVAC MODIFICATIONS TO CENTRAL SUPPLY
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For use by the Engineer: <input type="checkbox"/> Recommended <input type="checkbox"/> Recommended as noted <input type="checkbox"/> Not Recommended <input type="checkbox"/> Received too late Insufficient data received By _____ Date _____	For use by the Owner <input type="checkbox"/> Approved <input type="checkbox"/> Not Approved <input type="checkbox"/> Approved as noted By _____ Date _____
---	--

Fill in the Blanks Below:

Does the substitution affect dimensions shown on Drawing?

Yes No If yes, clearly indicate changes.

Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution?

Yes No If no, fully explain: _____

What effect does substitution have on other Contracts or other trades?

What effect does substitution have on construction schedule?

Manufacturers warranties of the proposed and specified items are:

Same Different. Explain:

Reason For Request:

Itemized comparison of specified item(s) with the proposed substitution; list significant

variations: Designation of maintenance services and sources:
 (Attach additional sheets if required.)

END OF DOCUMENT 002120

HVAC MODIFICATIONS TO CENTRAL SUPPLY
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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
 - 5. Disposal of construction waste.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.

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3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Administrative/supervisory personnel:

1. General: In addition to a General Superintendent and other administrative and supervisory personnel required for performance of the work, provide specific coordinating personnel as specified herein.
2. Project Manager: The Project Manager will have a complete working knowledge and understanding of the building codes and construction standards. This person will have a minimum of eight to ten (8-10) years construction experience and shall have completed a minimum of three (3) projects of at least similar size and complexity in the capacity of manager in the last eight to ten (8-10) years.
3. Any personnel change to the Superintendent or the Project Manager must be reviewed and approved by the Owner. Resume's and references of the Superintendent and Project Manager will be required.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

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1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Engineer will return RFIs submitted to Engineer by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: All Requests for Information (RFI) shall be submitted on the form included the end of this section.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow 15 (fifteen) working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.

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- f. Requests for interpretation of Engineer's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.
 - 3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 (ten) days of receipt of the RFI response. If not received in the aforementioned time frame it shall be considered as a no cost or time impact to the work.

1.8 PROJECT MEETINGS

- A. General: Contractor shall schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within 3 (three) days of the meeting.
- B. Preconstruction Conference: Engineer will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 (fifteen) days after execution of the Agreement.
 - 1. Conduct the conference to review responsibilities and personnel assignments.
 - 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Lines of communications.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.

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- l. Use of the premises.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
 - y. Testing and inspecting requirements.
 - z. Installation procedures.
 - aa. Coordination with other work.
 - bb. Required performance results. cc. Protection of adjacent work.
 - dd. Protection of construction and personnel.
4. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
5. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
6. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- C. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Engineer, but no later than 30 (thirty) days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
- D. Coordination Meetings: Conduct Project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.
- 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to

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conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.9 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Disposal: Remove waste materials from Owner's property and legally dispose of them.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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REQUEST FOR INFORMATION

From: _____

Project: HVAC Modification to Central Supply
at
Lallie Kemp Regional Medical Center

To: Howell Consultant, LLC
360 Mapleridge Drive
Mandeville, La. 70471
PH (985) 626-9305

HC Project No. 19003
RFI No.: _____

Attachment: _____ Yes _____ No

Attn: Scott Howell _____

Date Response Requested: _____

Reference:

Spec Section _____

Drawings: _____

Question: _____

Proposed Solution:

Signed: _____

Date: _____

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P.O.R. Response:

Signed: _____

Date: _____

Cc: _____

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

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1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings shall be available by Engineer for Contractor's use in preparing submittals.
1. Engineer shall furnish Contractor digital data drawing files of the Contract Drawings for use in preparing Shop Drawings and Project record drawings upon request.
 - a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCad 2012 Operating in Microsoft Windows Operating System.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 14 (fourteen) days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 14 (fourteen) days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Engineer's consultants, Owner, or other parties is indicated, allow 21 (twenty one) days for initial review of each submittal.
 5. Submittals requiring calculations: allow 21 (twenty one) days for initial reviews and resubmittals for any submittal requiring review of calculations.
 6. Insert list of submittals requiring sequential review in first subparagraph below, or delete and identify submittals in Sections where they are specified. Structural, HVAC, plumbing, and electrical components are examples of the Work that often require sequential review.

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7. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Engineer and to Engineer's consultants, allow 14 (fourteen) days for review of each submittal. Submittal will be returned to Engineer before being returned to Contractor.

D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 7 by 7 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information for processing and recording action taken:

- a. Project name.
- b. Date.
- c. Name of Engineer.
- d. Name of Contractor.
- e. Name of subcontractor.
- f. Name of supplier.
- g. Name of manufacturer.
- h. Submittal number or other unique identifier, including revision identifier.

- 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

- i. Number and title of appropriate Specification Section.
- j. Drawing number and detail references, as appropriate.
- k. Location(s) where product is to be installed, as appropriate.
- l. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

- a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Engineer.
- b. If requested by Owner, provide one additional copy for Owner's concurrent information.

5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will return without review submittals received from sources other than Contractor.

- a. Transmittal Form for Paper Submittals: Use sample form included at the end of this section.
- b. Transmittal Form for Paper Submittals: Provide locations on form for the

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following information:

- 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Engineer.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Indication of full or partial submittal.
 - 15) Transmittal number, numbered consecutively.
 - 16) Submittal and transmittal distribution record.
 - 17) Remarks.
 - 18) Signature of transmitter.
- E. Options: Identify options requiring selection by Engineer.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Engineer's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

SUBMITTAL PROCEDURES

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- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Action Submittals: Submit 5 (five) paper copies of each submittal unless otherwise indicated. Engineer will return 4 (four) copies.
 2. Informational Submittals: Submit 3 (three) paper copies of each submittal unless otherwise indicated. Engineer will not return copies.
 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. Five (5) paper copies of Product Data unless otherwise indicated. Engineer will return four (4) copies.

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- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Engineer's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.
 3. Submit Shop Drawings in the following format:
 - a. Two bond copies of each submittal. Engineer will return one (1) copy.
- D. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- E. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- F. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- G. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
- H. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- I. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- J. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- K. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

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1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. The Contractor's notations on the shop drawings are to be in green ink. Mark with approval stamp before submitting to Engineer.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

- A. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 1. Final Unrestricted Release: Where submittals are marked "REVIEWED: NO EXCEPTION NOTED" and "RESUBMITTAL NOT REQUIRED", that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 2. Final-But-Restricted Release: When submittals are marked "REVIEWED: EXCEPTION NOTED" and "RESUBMITTAL NOT REQUIRED" that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 3. Returned for Resubmittal: When submittal is marked "REJECTED" or "REVIEWED EXCEPTIONS NOTED" and "RESUBMITTAL REQUIRED", do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations;

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resubmit without delay. Repeat if necessary to obtain a different action mark.

4. Do not permit submittals marked “REJECTED” and “RESUBMITTAL REQUIRED”, or “REVIEWED, EXCEPTIONS NOTED” and “RESUBMITTAL REQUIRED”, to be used at the Project site, or elsewhere where Work is in progress.
 5. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, unmarked with only date and signature.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
 - C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
 - D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
 - E. Submittals not required by the Contract Documents may be returned by the Engineer without action.
 - F. If, during the Engineer’s review of a shop drawing submittal, the Engineer determines that the Contractor has not reviewed the shop drawings (Re: numerous mistakes in the drawings, non-approved items, missing information, etc.), the shop drawings will be returned with no action taken.
 - G. Do not submit shop drawings on an item in a “piece meal” fashion. Submit as a complete package (i.e., Items in a specification section should be submitted under one transmittal and in total. Do not submit shop drawings or provide data in loose sheet fashion. All submittals to be bound.)
 - H. Submit items which have to be reviewed by the Office of the State Fire Marshal as soon as possible to avoid delaying the project while awaiting the Fire Marshal review.
 - I. If the Specifications requires a sample warranty to be submitted along with the product data for review, submit copies that have been completed and ready for execution, but marked Sample Warranty.
 - J. The Contractor shall coordinate electrical requirements (voltage, wire sizes, disconnect switches, breaker sizes, etc.) between mechanical and electrical items at the time of the submittals to insure the equipment will be ordered correctly.
 - K. The Contractor shall perform no portion of the work requiring submittal and review of shop drawings. Product data, samples of similar submittals until the respective submittal has been approved by the Engineer. Such work shall be in accordance with approved submittals.

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Contractor's Letterhead

SUBMITTAL

TRANSMITTAL DATE:

TO: Howell Consultants, LLC
 360 Mapleridge Drive
 Mandeville, La. 70471

RE:

PRODUCT/MATERIAL: Provide general description of material. (Example: Wood
 Blocking)

SECTION NUMBER AND NAME: Refer to Specification Section or Table of Contents.
 (Example: 061000 – Rough Carpentry)

TYPE OF SUBMITTAL: State type of Submittal(s): Shop Drawings, Coordination
 Drawings, Samples, Product Data, or other Submittals.

NUMBER OF COPIES: State number of copies or samples.

NUMBER OF SHEETS: State number of sheets in submittal.

CONTRACTORS SUBMITTAL NO.: Indicate submittal number shown on he Contractor's
 Submittal Schedule.

DATE OF SUBMITTAL: Indicate date on Contractor's stamp or submittal.

SUBCONTRACTOR: Indicate name of entity performing the work.

SUPPLIER: Indicate name of entity supplying product.

DEVIATIONS: Indicate any deviation from the specifications. If no deviations
 from products specified, indicate that no deviations exist.

REMARKS: Indicate any supplemental comments concerning this submittal.
 (Example: This submittal is required for fabrication of millwork.
 Please expedite as soon as possible.)

BY: Name of person preparing Submittal
 Contractor's Name

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Contractor's Letterhead
COVER SHEET

DATE:

RE:

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This space reserved for stamps.

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SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 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.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract. A substantial amount of specification language constitutes definitions for terms found in other Contract Documents, including drawings which must be recognized as diagrammatic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to extent not stated more explicitly in another provision of Contract Documents.
- B. "Approved": When used to convey Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.

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- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- J. "Approved": Where used in conjunction with Engineer's/Engineer's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" will be held to limitations of Engineer's/Engineer's responsibilities and duties as specified in General and Supplemental Conditions. In no case will "approval" by Engineer/Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.
- K. "Installer": The entity (person or firm) engaged by Contractor or its subcontractor or sub-subcontractor for performance of a particular unit of work at project site, including installation, erection, application, and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.
- L. "Testing Laboratory": An independent entity engaged to perform specific inspections or tests of the work, either at project site or elsewhere; or to report and (if required) interpret results of those inspections or tests.
- M. Owner Furnished - Contractor Installed (OFCI): Equipment or components of a system that are purchased by the Owner and furnished to the Contractor for installation in the project. The Contractor shall receive, store, protect, install, connect and test each item unless otherwise indicated.
- N. Contractor Furnished - Contractor Installed (CFCI): Equipment or components of a system that are purchased, furnished and installed by the Contractor.
- O. Existing Equipment -Vendor Installed (EEVI): Existing Equipment or components of a system that are installed by the Owner or his vendors.
- P. Owner Furnished-Vendor Installed (OFVI): The Owner shall be responsible for furnishing and the Owner's Vendor shall be responsible for installing this equipment. The Contractor shall be required to furnish the rough-in as shown on the Contract Documents. The Contractor shall cooperate with the Owner's Vendor during installation

1.3 FORMAT AND SPECIFICATION EXPLANATIONS

- A. Specification Production: None of these explanations will be interpreted to modify substance of requirements. Portions of these specifications have been produced by Engineer's/Engineer's standard methods of editing master specifications, and may contain minor deviations from traditional writing formats. Such deviations are a normal result of this production technique, and no other meaning will be implied or permitted.
- B. Format Explanation: The format of principal portions of these specifications can be described as follows; although other portions may not fully comply and no particular significance will be attached to such compliance or noncompliance.

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1. Sections and Divisions: For convenience, basic unit of specification test is a "section", each unit of which is named and numbered. These are organized into related families of sections, and various families of sections are organized into "divisions", which are recognized as the present industry consensus on uniform organization and sequencing of specifications. The section title is not intended to limit meaning or content of section, nor to be fully descriptive of requirements specified therein, nor to be an integral part of text.
 - a. Each section of specifications has been subdivided into 3 (or less) "parts" for uniformity and convenience (Part 1 -General, Part 2 Products, and Part 3 Execution). These do not limit the meaning of and are not an integral part of text which specifies requirements.

- C. Underscoring: Used strictly to assist reader of specification text in scanning text for key words in content (for quick recall). No emphasis on or relative importance of text is intended where underscoring is used.

- D. Imperative Language: Used generally in specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities which must be fulfilled indirectly by Contractor, or when so noted, by others.

- E. Section Numbering: Used to facilitate cross-references in Contract Documents. Sections are placed in Project Manual in numeric sequence; however, numbering sequence is not complete, and listing of sections at beginning of Project Manual must be consulted to determine numbers and names of specification section in Contract Documents.

- F. Specification Content: Because of methods by which this project specification has been produced, certain general characteristics of content, and conventions in use of language are explained as follows:
 1. Specifying Methods: The techniques or methods of specifying to record requirements varies throughout text, and may include "prescriptive", "open generic descriptive", "compliance with standards", "performance", "proprietary", or a combination of these. The method used for specifying one unit of work has no bearing on requirements for another unit of work.
 2. Overlapping and Conflicting Requirements: Where compliance with 2 or more industry standards or sets of requirements is specified, and overlapping of those different standards or requirements establishes different or conflicting minimums or levels of quality, most stringent requirement (which is generally recognized to be also most costly) is intended and will be enforced, unless specifically detailed language written into contract documents (not by way of reference to an industry standard) clearly indicates that a less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which level of quality is more stringent, to Engineer/Engineer for a decision before proceedings.

- G. Minimum Quality/Quantity: In every instance, quality level or quantity shown or specified is intended as minimum for the work to be performed or provided. Except as otherwise specifically indicated, actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable limits. In complying with

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requirements, indicated numeric values are either minimums or maximums as noted or as appropriate for context of requirements. Refer instances of uncertainty to Engineer/Engineer for decision before proceeding.

- H. Specialists; Assignments: In certain instances, specification text requires (or at least implies) that specific work be assigned to specialists or expert entities, who must be engaged for performance of those units of work. These must be recognized as special requirements over which Contractor has no choice or option. These assignments must not be confused with (and are not intended to interfere with) normal application of regulations, union jurisdictions and similar conventions. One purpose of such assignments is to establish which party or entity involved in a specific unit of work is recognized as "expert" for indicated construction processes or operations. Nevertheless, final responsibility for fulfillment of entire set of requirements remains with Contractor.
- I. Trades: Except as otherwise indicated, the use of titles such as "carpentry" in specification text, implies neither that the work must be performed by an accredited or unionized trades person of corresponding generic name (such as "carpenter"), nor that specified requirements apply exclusively to work by trades persons of that corresponding generic name.
- J. Abbreviations: The language of specifications and other contract documents is of the abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in texts. Specific abbreviations have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of specification requirements which notations on drawings and in schedules. These are frequently defined in section at first instance of use. Trade association names and titles of general standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of the contract documents so indicates.

1.4 DRAWING SYMBOLS:

- A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated.
 - 1. M/E Drawings: Graphic symbols used on mechanical/electrical drawings are generally aligned with symbols recommended by ASHRAE, supplemented by more specific symbols where appropriate as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to Engineer/Engineer for clarification before proceeding.

1.5 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless

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otherwise indicated.

1. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.6 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

1.7 SUBMITTALS:

- A. Permits, Licenses and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Contractor may tap into Owner's utilities available at the site. No use charges are applicable.

1.4 INFORMATIONAL SUBMITTALS

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- B. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

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1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Engineerural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.
- D. Conservation: In compliance with Owner's policy on energy/materials conservation, install and operate temporary facilities and perform construction activities in manner which reasonably will be conservative and avoid waste of energy and materials including water.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate the needs of Owner, Engineer, and construction personnel office activities. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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- B. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- B. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
- C. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - 2. Install lighting for Project identification sign.
- D. Telephone Service:
 - 1. Provide superintendent with cellular telephone for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within area designated that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 - 2. Maintain support facilities until Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial

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Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
 - 3. Maintain full access to the emergency room entrance for ambulances and automobile. When blocking access to the emergency room entrance, be fully prepared to remove blocking trucks, cranes or equipment immediately if access is required by the owner.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Division 01 Section "Summary."
- C. Temporary Erosion and Sedimentation Control: Comply with requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements.
- D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
 - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
 - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- E. Storm water Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.
- F. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial

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Completion. Perform control operations lawfully, using environmentally safe materials.

- G. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- H. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- I. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- J. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas and on any part of the campus. This includes working area and construction office and vehicles.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
- L. All structural steel shall be properly secured and braced at the end of each working day.
- M. All concrete forms shall be adequately fastened in place.
- N. All construction materials shall be adequately protected against wind damage during storage.
- O. All tarpaulins or any other temporary enclosure materials, shall be securely fastened.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

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- B. Construction Phase: Where materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
 2. Protect stored and installed material from flowing or standing water.
 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 4. Remove standing water from decks.
 5. Keep deck openings covered or dammed.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Operate Project identification sign lighting daily from dusk until dawn.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- E. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area landscape repair is required, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Return landscaped areas to their original condition. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

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SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Division 01 Section "Substitution Procedures" for requests for substitutions.
 - 2. Division 01 Section "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

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- A. Comparable Product Requests: Prior to bid, submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Use Pre-Bid Substitution Form attached at the end of this section.
 2. Pre-Bid Substitution Form and documentation necessary for evaluation must be received by Engineer ten (10) working days prior to bid date.
 3. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 4. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within fourteen (14) days of receipt of request or seven (7) days of receipt of additional information or documentation, whichever is later and will include in an addendum if acceptable.
 - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
 - b. Use product specified if Engineer does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

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3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. **Manufacturer's Warranty:** Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. **Special Warranty:** Written warranty required by the Contract Documents to provide specific rights for Owner.

B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution.

1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
2. **Specified Form:** When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. **Submittal Time:** Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

PRODUCT REQUIREMENTS

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- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "Engineer approved equal," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
- a. Non-restricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 2. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 - b. Non-restricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
 3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Prior to bid, the Engineer will consider Contractor's request for comparable product as detailed in Section 002120 "Pre-Bid Substitution Procedures".

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PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

- 1. Construction layout.
- 2. Field engineering and surveying.
- 3. Installation of the Work.
- 4. Cutting and patching.
- 5. Coordination of Owner-installed products.
- 6. Progress cleaning.
- 7. Starting and adjusting.
- 8. Protection of installed construction.
- 9. Correction of the Work.

- B. Related Requirements:

- 1. Division 01 Section "Summary" for limits on use of Project site.
- 2. Division 01 Section "Submittal Procedures" for submitting surveys.
- 3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
- 4. Division 07 Section "Penetration Fire stopping" for patching penetrations in fire- rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

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1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Mechanical systems piping and ducts.
 - e. Control systems.
 - f. Communication systems.
 - g. Fire-detection and alarm systems.
 - h. Conveying systems.
 - i. Electrical wiring systems.
 - j. Operating systems of special construction.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Equipment supports.
 - d. Piping, ductwork, vessels, and equipment.
 - e. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 sustainable design requirements Section.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Engineer for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.
- B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- C. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Engineer.

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3.4 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance

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of other construction, and subsequently patch as required to restore surfaces to their original condition.

- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Division 01 Section "Summary."
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.

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3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

E. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

F. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

G. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

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3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

END OF SECTION 017300

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SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
 - 6. Final property survey
- B. Related Requirements:
 - 1. Division 01 Section "Execution" for progress cleaning of Project site.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.

1.3 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS
CLOSEOUT PROCEDURES

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- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 (ten) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Engineer. Label with manufacturer's name and model number where applicable.

- a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Engineer's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Reference Section 00800 Supplementary Conditions Section 9.8 for additional documentation and procedures.
7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 (ten) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Complete startup and testing of systems and equipment.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in

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Division 01 Section "Demonstration and Training."

4. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
5. Terminate and remove temporary facilities from Project site, along with construction tools, and similar elements.
6. Complete final cleaning requirements, including touchup painting.
7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 14 (fourteen) days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

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- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding to interior spaces.
 2. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer.
 - d. Name of Contractor.
 - e. Page number.
 3. Submit list of incomplete items in the following format:
 - a. Three (3) paper copies. Engineer will return two (2) copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 14 (fourteen) days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even- textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Remove labels that are not permanent.
 - i. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - j. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

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- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 2. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 017700

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SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Engineer will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

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- B. Format: Submit operations and maintenance manuals in the following format:
1. Contractor shall coordinate and integrate the following requirements into their OPERATION AND MAINTENANCE DATA specifications: “The Contractor shall provide three (3) hard-bound sets of O&M information which shall contain the following:
 - a. All O&M manuals
 - b. All required warranty certificate
 - c. A letter from the stating the start date and duration of all warranty items
 - d. The name and phone numbers of the Contractors point-of-contact for all warranty repairs
 - e. A list with the contact information of the warranty providers for all systems and equipment” The Contractor shall deliver the copies of the reviewed, final O&M documentation to the Engineer. The Engineer shall transmit the O&M documentation to the Owners Representative Project Manager (PM) for final distribution to the Owners parties.
- C. Initial Manual Submittal: Submit draft copy of each manual at least thirty (30) days before commencing demonstration and training. Engineer will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least fifteen (15) days before commencing demonstration and training. Engineer will return copy with comments.
1. Correct or revise each manual to comply with Engineer's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Engineer's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

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- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Engineer.
 - 7. Names and contact information for major consultants to the Engineer that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

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1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Precautions against improper use.
 6. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.

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2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.

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2. Schedule for routine cleaning and maintenance.
 3. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly,

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- monthly, quarterly, semiannual, and annual frequencies.
- 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or

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systems.

- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."
- G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Execution" for final property survey.
 - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one (1) paper-copy set(s) of marked-up record prints.
 - 2) Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Print each drawing, whether or not changes and additional information were recorded.

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PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Revisions to details shown on Drawings.
 - b. Revisions to routing of piping and conduits.
 - c. Revisions to electrical circuitry.
 - d. Actual equipment locations.
 - e. Locations of concealed internal utilities.
 - f. Changes made by Change Order or Construction Change Directive.
 - g. Changes made following Engineer's written orders.
 - h. Details not on the original Contract Drawings.
 - i. Field records for variable and concealed conditions.
 - j. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red ink. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

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- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 2. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 3. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: provide 3 (three) copies of record specification as paper copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 2. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file

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miscellaneous records and identify each, ready for continued use and reference.

- B. Format: Submit miscellaneous record submittals as paper copy.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.

END OF SECTION 017839

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SECTION 230010 – MECHANICAL GENERAL PROVISIONS

1 PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1.1.1 General Provisions of Contract, including General, Supplementary and Special Conditions apply to the work in this section.

1.2 DESCRIPTION OF WORK

1.2.1 Extent: Work required under this section consists of all mechanical work and related items necessary to complete the work indicated on the drawings and/or described in the specifications.

1.2.2 Furnish all labor, equipment, tools, transportation, etc., and furnish and install all materials and equipment necessary for mechanical work hereinafter described all in accordance with the specifications and accompanying drawings.

1.2.3 Specifications and accompanying drawings intended to show and describe complete mechanical installation, fully erected, properly installed in workmanlike manner and left in proper operating condition, with Contractor furnishing and installing everything necessary to complete the job.

1.2.4 Furnish all labor, equipment, tools, materials, accessories, etc., for all rough-ins and final connections, complete, for all equipment indicated on the drawings, or equipment furnished by others.

1.3 GENERAL REQUIREMENTS

1.3.1 Regardless of titles and subdivisions herein employed, consider these specifications as one complete document with General Section applying to all other sections.

1.3.2 Check mechanical specifications and drawings with remainder of set, and bring to Engineer's attention any conflicts or variations as soon as noted.

1.3.3 Specifications and accompanying drawings apply to all contracts or subcontracts entered into for supplying material or labor for construction of work specified herein and shown on drawings.

1.3.4 Adequately protect against injury all installed and existing material, equipment, motors, fixtures, piping, insulation, etc.

1.3.5 Replace lost or damaged items prior to acceptance of work.

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1.3.6 Adequate and competent supervision shall be provided by this section to assure that work is done in accordance with good standard practice and workmanship and with intent of drawings and specifications.

1.4 INSTALLER'S QUALIFICATIONS

1.4.1 All contractors submitting bids for the work under this contract shall be specialists in their field and shall have the personal experience, training and skill to construct a properly operating mechanical system as described by the contract drawings.

1.4.2 If required, the contractor shall be able to furnish evidence of having not less than three years experience and having been responsible for at least three projects comparable in size and complexity to this one.

1.5 WORKMANSHIP

1.5.1 All work performed shall be in accordance with best standards of practice by workmen skilled and qualified in type of work to be done. Schedule and perform mechanical work to avoid delays to project.

1.6 CODES AND STANDARDS

1.6.1 All work shall be installed in strict accordance with all existing local, parish/county and state codes and ordinances having jurisdiction, and shall also be in accordance with the latest edition of the following national codes:

National Fire Protection Association
International Building Code
International Mechanical Code
International Plumbing Code

1.6.2 All mechanical systems, including material and workmanship, shall be in accordance with the latest edition of the following industry standards:

ASHRAE	American Society of Heating Refrigeration and Air Conditioning Engineers
ASPE	American Society of Plumbing Engineers
UL	Underwriter's Laboratories, Inc.
NEMA	National Electrical Manufacturer's Association
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ASME	American Society of Mechanical Engineers
NBBPVI	National Board of Boiler and Pressure Vessel Inspectors (for pressure vessel and boilers)

1.6.3 Local codes shall take precedence over state codes which shall take precedence over national codes and industry standards.

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- 1.6.4 If any conflicts are found between specifications and drawings and above authorities, notify Engineer as soon as conflicts are discovered and above codes and requirements will govern.
- 1.7 PERMITS AND INSPECTIONS
- 1.7.1 Secure all permits and inspections and pay all fees, assessments and taxes necessary for completion and acceptance of work. Notify Architect and proper authorities in ample time when any work is ready to be inspected or tested.
- 1.7.2 Obtain certificates of inspection and approval, as applicable to various portions of work, from inspection agency having jurisdiction.
- 1.7.3 No work shall be buried or concealed without inspection and approval from the architect
- 1.8 VISIT TO JOB SITE
- 1.8.1 Visit and examine job site and check with utility authorities concerned in order to become familiar with all existing conditions pertinent to work to be performed. No additional compensation will be allowed for failure to be so informed.
- 1.9 DRAWINGS
- 1.9.1 Bidders must review drawings and specifications of other disciplines including plans, details, diagrams, notes, etc., in order to understand structural conditions, construction requirements, clearances, capacities and methods of installation and erection. Structural and other conditions may require certain modifications and adjustments from conditions shown. Such deviations are permissible; however, specified sizes, capacities and requirements affecting satisfactory performance and operation of installation shall remain unchanged.
- 1.9.2 Contractor is responsible for accuracy of clearances and for coordination with other trades. No equipment, piping, etc. shall be fabricated or installed without full coordination. Make allowance in bid for job conditions and interferences which will require offsets in piping.
- 1.9.3 Contractor shall remove and relocate, without additional compensation, any item that is installed without required coordination and is found to be in conflict with other trades. If field measurements show that equipment, ductwork, etc. cannot fit in the allotted space; it shall be brought to the attention of the Engineer prior to ordering or installing the equipment.
- 1.9.4 In event of conflict, any item exposed to view in finished work shall take precedence over items, which are concealed, such as ductwork, piping, etc. Generally, ductwork shall take precedence over piping unless piping requires a

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specific slope.

1.9.5 Whenever it becomes necessary to shift equipment or pipes, such changes shall be referred to Engineer for approval.

1.9.6 Ask for details whenever uncertain about method of installation.

1.10 PRODUCT SUBMITTALS

1.10.1 Submit equipment and product data sheets in accordance with requirements described in the Contract Documents prior to releasing equipment for manufacture or shipment. Product data sheets shall be manufacturer's printed literature specifically marked to indicate size and model numbers of equipment being furnished. All accessories required by the contract documents shall be clearly marked.

1.10.2 System capacities for air conditioning systems shall be clearly and completely indicated on a system summary sheet prepared specifically for that system, fan, etc. The summary sheet shall indicate equipment number designations, manufacturer's model numbers, capacities, electrical characteristics, etc. General data sheets shall not be acceptable for indicating system performance.

1.10.3 All data submitted shall be checked against specifications and drawings. For equipment requiring electrical connections, no approval shall be final or deliveries authorized until electrical characteristics and provisions for wiring are coordinated and cleared with Electrical Section by letter through Contractor or Engineer.

1.10.4 Review of product submittals does not relieve the contractor of responsibility for compliance with the contract documents for system capacities or for fitting the equipment in the allotted space. Review is for general compliance with the contract documents.

1.10.5 Submittals are required for the following items:

Access panels	Pumps
Manufactured hangers & supports	Vibration isolators
Valves (all types)	Piping insulation
Air conditioning equipment	Starters, speed controllers, etc.
	Temperature control system

1.11 SHOP DRAWINGS

1.11.1 Submit shop drawings in accordance with requirements described in General Supplementary and Special, Conditions of the Contract Documents prior to releasing equipment for fabrication or shipment. Shop drawings shall consist of plans, sections, elevations and details as required to clearly indicate size and

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location of equipment or products being provided. Drawings shall indicate required clearances of equipment being installed by others and shall show clearances with relations to mechanical equipment.

- 1.11.2 Submit shop drawings for the following:
- A. Equipment room layouts (Detailed plan with sections of any equipment room with Division 15 equipment)
 - B. Field fabricated hangers and supports
 - C. Built up air conditioning equipment
 - D. Temperature control diagrams including electrical interlock and sequence of operation.
- 1.12 MATERIALS AND EQUIPMENT
- 1.12.1 All materials and equipment must be new and product of reputable manufacturer regularly engaged in manufacture of product concerned. All materials shall bear the name of manufacturer and shall be of best quality obtainable unless specified or noted otherwise.
- 1.12.2 All materials and equipment must be of design, type, strength, etc., to satisfactorily accomplish purpose intended.
- 1.12.3 All equipment must be purchased from authorized factory representative with an established office within 50 miles of the project. The factory representative shall have factory trained and authorized technicians available 24/7 to respond to customer warranty or service calls as well as initial equipment start up.
- 1.13 PROTECTION OF WORK
- 1.13.1 Contractor shall protect all equipment, piping and work from damage. Damaged work will be rejected and replaced at the expense of the Contractor.
- 1.13.2 Piping shall be racked and handled in a manner to prevent entrance of dirt and foreign matter. Open pipe ends shall be plugged or capped during erection.
- 1.14 FRICTION LOSSES, ELECTRICAL RATINGS & SPACE REQUIREMENTS
- 1.14.1 The values of air and water friction losses, electrical current ratings and space requirements for various pieces of equipment, as contained in these Specifications or as shown on the Drawings, are estimated values and sizes and have been used in obtaining specifications for equipment and for sizing pipe, ducts, electric wiring and motor controls. Any necessary changes in ones shown shall be the responsibility of the Contractor, and shall be subject to the approval of the Engineer. Contractor shall pay all costs for additional labor and material required including costs of any other Contractor involved.

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1.15 CUTTING AND PATCHING

1.15.1 Be responsible for all cutting, fittings, etc., affecting mechanical work and coordinate with trades or other sections involved. Do not endanger any work by cutting, excavating or other operations, and do not cut or alter work of any other sections except with specific consent of Architect. Workmen skilled and qualified in trades involved shall do all cutting required under supervision of Contractor's Job Superintendent.

1.15.2 Cutting for piping by Mechanical Section.

1.15.3 Insure that all necessary chases, openings for pipes, ducts, etc., are provided at proper time as work of other sections progresses; otherwise, be held responsible for all such provisions at own expense.

1.15.4 All patching for mechanical work by General Section.

1.16 THIMBLES, INSERTS AND EXPANSION SHIELDS

1.16.1 Set in place, as formwork progresses, all necessary inserts and thimbles as required. Cutting of beams, concrete floors or walls not permitted without authorization from the Engineer.

1.16.2 All thimbles set in walls shall be of 20 gauge galvanized iron.

1.17 FLOOR AND CEILING PLATES

1.17.1 Furnish and install properly sized chrome plated brass escutcheon plates to conceal openings where piping or hangers pass exposed through floors, ceilings or walls.

1.18 MISCELLANEOUS DRAINS

1.18.1 Install drains for all relief valves, piping and equipment requiring it and run to suitable outlet.

1.19 PAINTING

1.19.1 All exposed equipment, pipes, etc., shall be painted under this division of specifications. Paint colors shall match the existing scheme on the job.

1.19.2 Clean, pretreat, prime, and paint new condenser water piping including valves, flanges, etc. to match existing. Apply coatings to clean, dry surfaces, using clean brushes. Clean the surfaces to remove dust, dirt, rust, and loose mill scale. Immediately after cleaning, provide the metal surfaces with one coat of pretreatment primer applied to a minimum dry film thickness of 0.3 mil, and one coat of zinc molybdate primer applied to a minimum dry film thickness of 1.0

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mil. Provide primed surfaces with one coat of green alkyd gloss enamel applied to a minimum dry film thickness of 1.0 mil

- 1.19.3 Protect all factory finishes. Where damaged, finish to be renewed at this section's expense. This section responsible for preservation of paint and finishes on mechanical equipment and materials during and after installation.

1.20 IDENTIFICATION OF PIPING

- 1.20.1 All service piping which is accessible for maintenance operations shall be identified with semi-rigid plastic (not pressure-sensitive) identification markers.

- 1.20.2 Direction of flow arrows is to be included on each marker, unless otherwise specified.

- 1.20.3 In conformance with "Scheme for the Identification of Piping Systems" (ANSI A13.1-1981), each marker must show (1) approved color-coded background, (2) proper color of legend in relation to background color, (3) approved legend letter size, and (4) approved marker length.

- 1.20.4 For pipes with outside diameter under 3/4 inch (too small for color bands and legends), brass identification tags (1½ inch diameter with depressed 1/4 inch high black-filled letters above 1/2 inch black-filled numbers) will be fastened securely by meter seals or brass jack chain at specified locations.

- 1.20.5 Locations for pipe markers and identification tags to be as follows:

- A. Entering and leaving pipes off chiller, cooling tower and pumps.
- B. At each pipe passage through walls.
- C. On all straight pipe runs every 10 feet.

1.21 IDENTIFICATION OF All MECHANICAL EQUIPMENT

- 1.21.1 Identify chillers, pumps, control components, cooling towers, and water treatment devices with plastic nameplates. All disconnects, starters, etc. shall be labeled as such with name of associated equipment, i.e. VFD for pump # X. Small devices may be identified with tags.

1.22 HANGERS AND SUPPORT WORK

- 1.22.1 Hang all piping 1½ inches and larger on ten foot maximum centers; ¾" to 1" on 7'-6" maximum centers; ½ inch and below on 4'-0" maximum centers.

- 1.22.2 Hangers in building shall be solid or split-type supported by vertical steel rods from masonry inserts, expansion shields or beam clamps. Where indicated, provide pipe supports from the floor or grade. All steel hanger materials shall be primed and painted. Brass, copper or lead insert hangers for insulated copper

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 piping.

- 1.22.3 Provide galvanized steel saddle between covering and pipe hanger on insulated pipes, pipe up to four inch diameter, 18 gauge x 12 inches long.
- 1.22.4 Support all piping independently of all equipment and arrange hangers to isolate any vibration transmission from piping to structure.
- 1.22.5 Perforated strap or band hangers not permitted.
- 1.22.6 Furnish and install steel supports and framework for each item of equipment or fixture in accordance with the manufacturer's recommendations or as detailed on drawings. All such work shall meet all applicable requirements specified under structural steel.
- 1.22.7 All mechanical work supported on walls or partitions by means of appropriately sized galvanized toggle bolts.

1.23 INSTALLATION OF PIPING

- 1.23.1 Install all piping so that it may expand and contract freely without damage to equipment, other work or injury to piping system. Support piping independently of all equipment.
- 1.23.2 Install necessary swing joints, expansion joints or offsets to protect piping systems, equipment or other work from damage whether indicated on drawings or not.
- 1.23.3 Install unions adjacent to all screwed cocks, control valves, discharge from relief valves. Flanged fittings are considered equivalent to union connections.
- 1.23.4 Install piping parallel and/or perpendicular to building floor, wall or ceiling planes, unless otherwise shown on drawings.
- 1.23.5 No piping of dissimilar metals placed in contact with each other. Provide insulating unions whenever piping of dissimilar metals is joined. Insulating couplings not acceptable.

1.24 ELECTRICAL WORK

- 1.24.1 All motors for mechanical equipment furnished under Mechanical Sections. Work shall include setting and aligning integral drive motors in operating position. Motors electrically connected under Electrical Division.
- 1.24.2 All power wiring and all disconnect switches furnished and installed under the Electrical Division.

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- 1.24.3 All other electrical work in connection with air conditioning, heating and ventilating equipment done under Mechanical Section.
- 1.24.4 Prior to the final release for manufacture or shipment of any equipment, it shall be the responsibility of the mechanical contractor to verify the available electrical service for each piece of equipment with the electrical contractor and to provide equipment that suits the available service.
- 1.24.5 Any equipment delivered to the site with incorrect voltage or phase shall be replaced at the contractor's expense.
- 1.25 CLEANING UP
- 1.25.1 After final testing, clean all fixtures, pipes and exposed work. Thoroughly clean and polish plated and other finished products.
- 1.25.2 Piping to be free of all obstructions. Remove all debris, surplus and waste materials completely from the job site.
- 1.26 LUBRICATION
- 1.26.1 Properly oil, grease and lubricate all motors, pumps, compressors, etc., before starting and until final acceptance of work.
- 1.27 PARTS CATALOGS AND OPERATING INSTRUCTIONS
- 1.27.1 Furnish to Engineer three complete sets of parts catalogs and operating instructions bound in large 3-ring binders for use of maintenance department. Include information for all equipment, fixtures, etc. submitted to the architect
- 1.27.2 Each set shall contain:
- A. Copy of original submittal data sheet with review stamp
 - B. Detailed operating instructions and instructions for making minor adjustments.
 - C. Complete wiring and control diagrams.
 - D. Routine maintenance operations.
 - E. Manufacturer's catalog data, service instructions and parts listed for each piece of operating equipment.
 - F. All equipment warranty documentation
 - G. All final inspection certificates for mechanical work
- 1.27.3 Contractor shall thoroughly instruct Owner or Owner's representative in operation and care of controls, individual equipment and entire mechanical system.
- 1.27.4 Instruction shall be in the form of two 4-hour instruction sessions given to the
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owner's representative(s) within six weeks of final acceptance of the project.

1.28 EQUIPMENT WARRANTY

1.28.1 Manufacturer warranties for all mechanical equipment furnished on the project shall run for a period of one year from date of "Substantial Completion". A/C Compressors shall always carry an additional 4 years parts and labor bringing it to a full five year parts and labor on compressors. During warranty, correct any defects in new equipment, materials or workmanship, without cost to Owner for either parts or labor.

1.28.2 Contractor shall arrange with the manufacturer to assure the equipment warranty conforms to the above stipulations and pay any required premiums, extended warranties, etc.

1.29 TESTING AND BALANCING

1.29.1 A competent and experienced service and installation mechanic shall be employed by the Contractor to start and adjust all equipment. The Engineer reserves the right to require the test of any item of equipment or machinery. Such tests shall be conducted by the Contractor in the presence of the Engineer or his authorized representative.

1.29.2 As construction progresses, test piping and equipment to pressure hereinafter specified. Where pressures are not mentioned, test to one and one-half times service conditions before concealing or insulating.

1.29.3 Flush all systems until clear water flows or as hereinafter specified.

1.29.4 Furnish all necessary gauges, instruments, pumps, test plugs and temporary connections. Test all equipment under service conditions and make all necessary adjustments to controls, valves, etc., to obtain best operation.

1.30 GUARANTEE

1.30.1 Guarantee all mechanical installations against all defects in equipment, materials and workmanship for a period of one year from date of "Substantial Completion". During guarantee period, correct any defects in new equipment, materials or workmanship, without cost to Owner for either parts or labor.

1.30.2 Contractor's guarantee includes performance capacities and ratings as specified.

1.31 AS-BUILT DRAWINGS

1.31.1 Contractor shall be furnished a complete set of blue line prints which shall be marked up by Contractor as work progresses to reflect all items of installation which differ significantly from work shown on contract drawings. As-built

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drawings shall be neatly done, not sketchy or free hand. Final payment will be withheld until drawings are furnished.

1.32 FINALLY

- 1.32.1 Drawings and specifications are complementary and what is shown and/or called for in one shall be furnished and installed the same as if shown and/or called for in the other.
- 1.32.2 For any points which are not clear, or for items and/or details which Contractor feels are in need of clarification, consult Engineer before submission of proposal.
- 1.32.3 If no clarifications are requested prior to the bid, the contractor, by submission of his bid, indicates he has a clear and full understanding of the intent of the plans and specifications.

END OF SECTION 230010

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SECTION 236000 - HVAC SYSTEMS

1 PART 1 - GENERAL

1.1 SCOPE

1.1.1 It includes cooling tower, pumps, motors, motor controllers, pipe and fittings, insulation, temperature controls, electrical work and other work indicated or necessary for complete and operating systems.

1.1.2 No work shall be concealed until it has been inspected, tested and approved by the Architect.

1.1.3 See Section 230010 Mechanical - General Provisions.

2 PART 2 - PRODUCTS

2.1 VARIABLE FREQUENCY DRIVES

2.1.1 The Adjustable Frequency Drives (AFDs) shall be solid state, with a Pulse Width Modulated (PWM) output waveform utilizing insulated gate bipolar transistors (IGBT's). The AFD package specified herein shall be completely assembled and tested by the manufacturer. The AFDs shall be mounted in a NEMA 1 enclosure. The drive efficiency shall be 97% or better at full speed and full load and the fundamental power factor shall be 0.98 at all speeds and loads. AFDs and options shall be UL Listed as a complete assembly.

2.1.2 All AFDs shall have the following standard features:

1. All AFDs shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating.
2. The keypad is to be used for local control, for setting all parameters, and for stepping through the displays and menus.
3. The keypad shall be removable, capable of remote mounting, and shall have its own non-volatile memory.
4. The keypad shall allow for uploading and downloading of parameter settings as an aid for start-up of multiple AFDs.
5. The AFDs shall utilize plain English digital display (code numbers and letters are not acceptable). All set-up parameters, indications, faults, warnings and other information must be displayed in words to allow the user to understand what is being displayed without the use of an installation manual or cross-reference table.
6. The keypad shall include Hand-Off-Auto membrane selections.
7. The drive shall incorporate "bumpless transfer" of speed reference when switching between "Auto" and "Hand" modes and vice-versa.

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8. The AFDs shall have reactors. Manufacturer shall include in the submittals harmonic distortion analysis (IEEE Standard 519, 5%) for this particular job-site including total voltage distortion with the submittals.
9. Manufacturers exceeding 5% total harmonic voltage distortion shall not be acceptable.

2.1.3 AFDs shall be provided with displays or meters showing :

1. Output frequency
2. Motor Speed (RPM)
3. Motor Current
4. Motor Power (kW)
5. DC Bus Voltage
6. Output Voltage
7. Heat Sink Temperature
8. Analog Input Values
9. PID Setpoint Values
10. Elapsed Time Meter (resettable)
11. kWh meter (resettable)
12. Last three faults

2.1.4 The AFDs shall operate continuously with an input voltage range from 380-480VAC $\pm 10\%$ [208 - 240VAC]. The AFD shall be suitable for use on a circuit capable of delivering not more than 65,000 RMS symmetrical amps, 480 V maximum.

2.1.5 The AFD shall be capable of starting into a rotating load (forward or reverse) and accelerate or decelerate to setpoint without safety tripping or component damage (flying start). The AFD shall also be capable of DC injection braking at start to stop a reverse spinning motor prior to ramp.

2.1.6 The AFDs shall have the following field programmable features:

1. If the input reference (4-20mA or 2-10V) is lost, the AFD shall give the user the option of either; (1) stopping and displaying a fault, (2) running at a programmable preset speed, (3) hold the AFD speed based on the last good reference received, or (4) cause a warning to be issued, as selected by the user. The drive shall be programmable to signal this condition via a keypad warning, relay output and/or over the serial communications bus.
2. PID Setpoint controller shall be standard in the drive, allowing a pressure or flow signal to be connected to the AFD, using the microprocessor in the AFD for the closed loop control. The AFD shall have 250 mA of 24 VDC auxiliary power and be capable of loop powering a transmitter supplied by others. The PID setpoint shall be adjustable from the AFD keypad, analog inputs, or over the communication's bus.
3. Control inputs and outputs:
 - Isolated

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- Five digital inputs
 - Two digital outputs
 - Two analog inputs
 - One analog output
4. Fully field programmable Digital outputs shall include field adjustable motor current levels for motor status. Drives not having this feature shall provide and install field adjustable three phase current relays for digital status of motor (proof of flow). Digital outputs must be true, form C type contacts; open collector outputs are not acceptable. Relays shall be capable of programmable on and off delay times. Analog output capabilities shall include, but not be limited to, frequency, speed, current, voltage, active reference, and kW indications. Manufacturers not having Kw output shall provide current transformers and kW transducers for kW output. The AFD shall have an RS-485 port as standard.
 5. The standard protocol shall be Modbus. The AFD shall be able to communicate with PLC's, DCS's, and DDC's. Serial communication capabilities shall include, but not be limited to, run-stop control, speed set adjustment, and PID control adjustments. The drive shall have the capability of allowing the DDC to monitor feedback such as process variable feedback, current (in amps), power (kW), kilowatt-hours (resettable), operating hours (resettable), relay outputs, and diagnostic warning and fault information. Additionally, remote (LAN) VFD fault reset shall be possible. A minimum of 15 field parameters shall be capable of being monitored.
 6. The AFD shall allow the DDC to control the drive's digital and analog outputs via the serial interface. The serial communications interface shall allow for DO (relay) control and AO (analog) control. In addition, all drive digital and analog inputs shall be capable of being monitored by the DDC system.
 7. The following optional features shall be furnished and mounted by the drive manufacturer. All optional features shall be UL Listed by the drive manufacturer as a complete assembly.
 8. Microprocessor based Bypass Controller - Manual or automatic (selectable) transfer to line power via contactors. A keypad to control the bypass controller is to be mounted on the enclosure door. The bypass keypad shall include a one line diagram and status LEDs to indicate the mode of operation, drive and bypass status and ready & enable conditions. When in the "Drive" mode, the bypass contactor is open and the drive output contactor is closed. In the "Bypass" position, the drive output contactor is open, and the bypass contactor is closed via Start/stop command. Start/stop via customer supplied maintained contact shall be 24V or 115V compatible and shall function in both the "Drive" and "Bypass" modes. The voltage tolerance of the bypass power supply shall be +30/-35% to eliminate the problem of contactor coil burnout. The design shall include single-phase protection in both the AFD and bypass modes.

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9. Automatic / manual bypass operation shall be selectable in the standard micro-processor based bypass design.
10. Door / cover interlocked disconnect switch which will disconnect all input power from the drive, bypass and all internally mounted options. The disconnect handle shall be through the door, and be padlockable in the "Off" position.
11. Fast acting semi-conductor fuses exclusive to the AFD – fast acting semi-conductor fuses allow the AFD to disconnect from the line prior to clearing upstream branch circuit protection, maintaining bypass capability. Bypass designs which have no such fuses, or that incorporate fuses common to both the AFD and the bypass will not be accepted. In such designs, a fuse clearing failure would render the bypass unusable. Class 20 or 30 (selectable) electronic motor overload protection shall be included in the microprocessor bypass to protect the motor in bypass mode.
12. The system shall have a manufacturer's warranty on all parts and for a period of one year from date of Substantial Completion as set by the project architect.
13. The design shown on the Drawings is based on ABB, Model ACH400. Alternate equipment will be acceptable if the manufacturer's equipment meets the scheduled performance and complies with these specifications. Acceptable manufacturers shall be General Electric, Westinghouse and Allen Bradley.

2.2 CONDENSATE PIPING

- 2.2.1 Piping shall be Type "L" copper tubing with wrought copper solder joint drainage type fittings. Install piping with cleanouts at each change of direction.
- 2.2.2 Provide ½" thick foamed plastic slip-on type on all condensate drain lines. Insulation shall be tightly butted and all joints sealed with waterproof vapor barrier adhesive.

2.3 FOUNDATIONS AND SUPPORTS

- 2.3.1 The Contractor shall provide all foundations, supports, etc. necessary for properly supporting his work and equipment furnished by him and shall furnish and install all isolation materials to prevent transmission of vibration to the building structure. Isolation of equipment as shown on drawings is the minimum required, and any additional isolation required to prevent transmission of vibration shall be provided by the Contractor, in accordance with the equipment manufacturer's recommendations.

3 PART 3 - EXECUTION

3.1 TESTING AND BALANCING

- 3.1.1 The Mechanical Contractor shall obtain the services of an independent test and bal-

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ance agency that specializes in and whose business is limited to the testing and balancing of HVAC systems. All final reports shall be signed by this certified test and balance engineer and shall include his official stamp.

- 3.1.2 Instruments used for testing and balancing of air and hydronic systems must have been calibrated within a period of six months and checked for accuracy prior to start of work.
- 3.1.3 Three copies of the complete test report shall be submitted to the Consulting Mechanical Engineer prior to final acceptance of the project.
- 3.1.4 The Contractor shall submit name of test and balance agency to Consulting Mechanical Engineer for approval within thirty days after receipt of the go to work letter.
- 3.1.5 If Contractor fails to submit name of selected test and balance agency within the above prescribed period, the Consulting Mechanical Engineer may then select the agency of his choice and the General Contractor must then issue purchase order for this work.
- 3.1.6 The Balance Contractor shall balance all water services to the quantities shown on the drawings, using instruments acceptable to the Engineer. Records of all balancing readings, on approved forms, shall be kept and shall be delivered to the Engineer upon completion of the project.
- 3.1.7 This contractor shall be responsible for normal start-up and prep of all mechanical systems and shall accomplish this prior to requesting the owner's balance contractor come to the site to begin balancing. Some of the items that shall be the responsibility of the contractor shall be as follows:

3.2 FLUSHING AND CLEANING

- 3.2.1 All piping, piping, etc. shall be thoroughly flushed of all debris and foreign objects before any system is placed in operation. After flushing, all strainers, traps and dirt legs shall be checked and cleaned. This operation must be acceptable to and approved by the Mechanical Engineer.

END OF SECTION 236000

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SECTION 236020 – COOLING TOWER

1. GENERAL

1.01. GENERAL REQUIREMENTS

The requirements of this Section shall conform to the general provisions of the Contract, including General and Supplementary Conditions, Mechanical General Conditions and Contract Drawings.

1.02. SCOPE

Provide factory assembled, induced draft, cross flow Cooling Tower of the scheduled capacities as shown and indicated on the Drawings, including but not limited to:

1. Cooling Tower package
2. Electrical power and control connections
3. Condenser liquid connections
4. Basin Heaters
5. Stainless Steel Components
6. Manufacturer start-up

1.03. QUALITY ASSURANCE

A. Products shall be Designed, Tested, Rated and Certified in accordance with, and Installed in compliance with applicable sections of the following Standards and Codes:

1. CTI STC-201 – Cooling tower Thermal Performance
2. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
3. ANSI/NFPA 70 – National Electrical Code (N.E.C.)
4. OSHA – Occupational Safety and Health Act
5. Manufactured in facility registered to ISO 9001

B. Cooling Tower manufacturer shall have a factory trained and supported service organization.

C. Warranty: Manufacturer shall warrant all equipment and material of its manufacture against defects in workmanship and material for a period as described below. During warranty, correct any defects in new equipment, materials or workmanship, without cost to Owner for either parts or labor.

1.04. DELIVERY AND HANDLING

A. Unit shall be delivered to job site, stored and handled per Manufacturer's instructions.

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B. Provide protective covering over vulnerable components for unit protection during shipment. Fit nozzles and open ends with plastic enclosures.

2. PRODUCTS

2.01. MANUFACTURERS

A. The design shown on the drawings is based on Baltimore Aircoil Company Model XES3E-8518-05K. Alternate equipment will be acceptable if the manufacturer's equipment meets the scheduled performance and complies with these specifications. Acceptable manufacturers shall be EVAPCO, Inc., and Marley. The Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:

1. Structural supports for units.
2. Piping size and connection/header locations.
3. Electrical power requirements and wire/conduit and overcurrent protection sizes.
4. Cooling Tower physical size relative to existing support structure.
5. Site noise considerations.

B. The Mechanical Contractor shall be responsible for all costs incurred by the General Contractor, Subcontractors, and Consultants to modify the building provisions to accept the furnished alternate equipment.

2.02. GENERAL

A. Description: Furnish and install factory assembled, induced draft, crossflow cooling tower with vertical air discharge, conforming in all aspects to the specifications, schedules and as shown on the plans. Overall dimensions shall not exceed available installation space as detailed on the drawings and as verified in at the site. The total connected fan horsepower shall not exceed 15 HP.

B. Thermal Capacity: The cooling tower shall be warranted by the manufacturer to cool 611 US GPM of water from 95° F to 85° F at 80° F entering wet bulb temperature. Additionally, the thermal performance shall be certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201. Lacking such certification, a field acceptance test shall be conducted within the warranty period in accordance with CTI Acceptance Test Code ATC-105, by the Cooling Technology Institute or other qualified independent third party testing agency. Manufacturers' performance guarantees or performance bonds without CTI Certification or independent field thermal performance test shall not be accepted. The cooling tower shall comply with the energy efficiency requirements of ASHRAE Standard 90.1.

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C. Corrosion Resistant Construction: Unless otherwise noted in this specification, all steel basin panels and structural members shall be constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel with all edges given a protective coating of zinc-rich compound.

D. Structure: The cooling tower shall be constructed with a sturdy structural frame designed to transmit all wind, seismic and mechanical loads to the equipment anchorage. The frame shall be constructed of heavy-gauge steel angles and channels. Corrosion resistant Type 304 stainless steel casing panels shall be used in lieu of FRP panels.

E. Cold Water Basin: The cold water basin shall be constructed of heavy-gauge Type 304 stainless steel panels and structural members. All factory seams shall be welded to ensure watertight construction and welded seams shall be warranted against leaks for a period of five (5) years from date of shipment. Stainless steel basins with bolted seams are not acceptable. Basin shall include a depressed center section with drain/clean-out connection. The basin area under the fill shall be sloped toward the depressed center section to facilitate cleaning. Standard basin accessories shall include a corrosion resistant make-up valve with large diameter plastic float for easy adjustment of the operating water level, removable anti-vortexing device to prevent air entrainment, and large area lift out strainers with perforated openings sized smaller than the water distribution system nozzles.

F. Water Outlet: The water outlet connection shall be beveled for welding and grooved for mechanical coupling or bolt hole circle designed to accept an ASME Class 150 flat face flange. The outlet shall be provided with large-area lift out strainers with perforated openings sized smaller than the water distribution nozzles and an anti-vortexing device to prevent air entrainment. The strainer and vortex device shall be constructed of the same materials as the cold water basin to prevent dissimilar metal corrosion.

G. Water Distribution System: The hot water distribution basins shall be open and gravity fed for easy cleaning, and constructed of Type 304 stainless steel. The basins must be accessible from outside the unit and serviceable during tower operation. Basin weirs and plastic metering devices shall be provided to assure the even distribution of water over the fill. Weir dams shall accommodate a flow range of 50% to 100% of the design flow rate. Lift-off distribution covers shall be constructed of heavy-gauge Type 304 stainless steel and designed to withstand 50 psf live load or a 200 pound, concentrated load. Gravity flow nozzles shall be snap-in type for easy removal. Should pressurized nozzles be used, they shall utilize grommets, which ensure easy removal.

2.03. MECHANICAL EQUIPMENT

A. Fan: Fan shall be heavy-duty, axial flow with aluminum alloy blades selected to provide optimum cooling tower thermal performance with minimal sound levels. Air shall discharge through a fan cylinder designed for streamlined air entry and minimum tip clearance for maximum fan efficiency. The top of the fan cylinder shall be equipped with a conical, non-sagging removable fan guard.

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B. Bearings: Fan and shaft shall be supported by heavy-duty, self-aligning, grease-packed ball bearings with moisture proof seals and integral slinger collars, designed for a minimum L₁₀ life of 80,000 hours.

C. Fan Drive: The fan shall be driven by a one-piece, multi-groove, solid back V- type power band with taper lock sheaves designed for 150% of the motor nameplate horsepower. The power band shall be constructed of neoprene reinforced polyester cord and be specifically designed for cooling tower service.

D. Sheaves: Fan and motor sheave shall be fabricated from corrosion-resistant materials to minimize maintenance and ensure maximum drive and power band operating life.

E. Mechanical Equipment Warranty: The fan, fan shaft, sheaves, bearings, and mechanical equipment support and fan motor shall be warranted against defects in materials and workmanship for a period of five (5) years from date of shipment. An additional two years of warranty, for a total of seven (7) years, shall be provided for fan motor when space heaters are field-wired at time of initial installation.

2.04. FILL AND DRIFT ELIMINATORS

A. Fill and Drift Eliminators: The fill and integral drift eliminators shall be formed from self-extinguishing (per ASTM-568) polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, fungus and biological attack. The fill shall be suitable for entering water temperatures up to and including 130° F. The fill shall be manufactured, tested and rated by the cooling tower manufacturer and shall be elevated above the cold water floor to facilitate cleaning.

2.05. Air Inlet Louvers

A. Air Inlet Louvers: Air Inlet louvers shall be separate from the fill and removable to provide easy access for inspection of the air/water interface at the louver face. Louvers shall prevent water splash out during fan cycling and be constructed of maintenance free, corrosion and UV resistant, fiberglass reinforced polyester (FRP).

2.06. ACCESS

A. Plenum Access: Two hinged access doors shall be provided for access into the plenum section.

2.07. SOUND

A. Sound Level: To maintain the quality of the local environment, the maximum sound pressure levels (dB) measured 50 ft from the cooling tower operating at full fan speed shall not exceed the sound levels detailed below. If the tower exceeds these conditions the tower must be either oversized and reduced in horsepower, provided with a low sound fan, or provided with sound attenuation.

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2.08. REQUIRED ACCESSORIES

A. Basin Heaters: The cooling tower cold water basin shall be provided with electric heaters to prevent freezing in low ambient conditions. The heaters shall be selected to maintain 40° F basin water temperatures at 0° F ambient. The heaters shall be 460 V/3 phase/ 60 Hz electric and shall be provided with low water cutout and thermostat.

B. Basin Water Level Control: The cooling tower manufacturer shall provide an electric water level control (EWLC) system. The system shall consist of water level sensing and control units in quantities and locations as indicated on the drawings. Each water level sensing and control unit shall be hermetically sealed and consist of the following:

1. Solid state controls including all necessary relays and contacts to achieve the specified sequence of operation.
2. Status code L. E. D which illuminates to indicate status; stainless steel water level sensing electrodes with brass holder.
3. Schedule 40 PVC standpipe assembly with vent holes, and all necessary stainless steel mounting hardware. Provide PVC union directly below the control enclosure to facilitate the removal and access of electrodes and control enclosure. The number and position of water level sensing electrodes shall be provided to sense high water level, low water level, high water alarm level, low water alarm level, and heater safety cutout.

C. Vibration Cutout Switch: Provide a mechanical local reset vibration switch. The mechanical vibration cutout switch will be guaranteed to trip at a point so as not to cause damage to the cooling tower. To ensure this, the trip point will be set in a frequency range of 0 to 3,600 RPM and a trip point of 0.2 to 2.0 g's.

D. Ladder: An aluminum ladder, with galvanized steel safety cage, shall be provided for access to the fan deck. Access door or service platforms are not acceptable.

E. Handrails: 1-1/4" galvanized steel pipe handrail shall be provided around the perimeter of the cooling tower cells. The handrails shall be provided with knee and toe rails and shall conform to the requirements of OSHA applicable at the time of shipment.

F. Internal Walkway: An internal walkway shall be provided in the plenum section to provide for inspection and maintenance. All working surfaces shall be able to withstand 50 psf live load or 200 pound concentrated load. Other components of the cooling tower, i.e. basin and fill/drift eliminators, shall not be considered an internal working surface.

END OF SECTION 236020

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SECTION 236030 – HYDRONIC PUMPS

PART 1 – GENERAL

1.01 SCOPE

- A. Provide pumps and required system trim for chilled water systems including all related appurtenances for a complete and operating system.

1.02 SECTION INCLUDES

- B. Close Coupled, Vertical Inline Pump

1.03 RELATED SECTIONS

- A. Drawings and general provisions of the contract, including general and supplementary Conditions and HVAC General Provisions apply to this section:

1.04 REFERENCES

- A. HI - Hydraulic Institute.
- B. ANSI - American National Standards Institute.
- C. OSHA - Occupational Safety & Health Administration.
- D. ASHRAE – American Society of Heating, Refrigeration and Air-Conditioning Engineers.
- E. NEMA - National Electrical Manufacturers Association.
- F. UL - Underwriters Laboratories.
- G. ETL - Electrical Testing Laboratories.
- H. CSA - Canadian Standards Association.
- I. NEC - National Electric Codes.
- J. ISO - International Standards Organization.
- K. IEC - International Electrotechnical Commission.
- L. ASME – American Society of Mechanical Engineers.

1.05 SUBMITTAL

- A. Submit each item in this article according to the Conditions of the Contract and HVAC General Provisions Specification Section.
- B. Submit manufacturer's installation instructions under provisions of HVAC General Provisions.

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- C. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts lists.
- D. Under provisions of commissioning documentation, testing of pumps, as well as training of owner's operation and maintenance personnel may be required in cooperation with the commissioning consultant.
- E. Product Data including certified performance curves and rated capacities of selected model, weights (shipping, installed, and operating), furnished specialties, and accessories. Indicate pump's operating point on curves.
- F. Complete Package information Product Data including:
 - System summary sheet (where applicable)
 - Sequence of Operation
 - Shop drawing indicating dimensions, required clearances and location and size of each field connection
 - Power and control wiring diagram
 - System profile analysis including pump curves, system curve, and variable speed pump curves (where applicable)
 - Pump data sheets - Rated capacities of selected models and indication of pump's operating point on curves.
 - Submittals on furnished specialties and accessories
 - Submittals must be specific to this project. Generic submittals will not be accepted.
- G. Hanging and support requirements should follow the recommendations in the manufacturer's installation instructions.

1.06 QUALITY ASSURANCE

- A. All equipment or components of this specification section shall meet or exceed the requirements and quality of the items herein specified, or as denoted on the drawings.
- B. Ensure pump operation, at specified system fluid temperatures without vapor binding and cavitation, is non-overloading in parallel or individual operation, and operates to ANSI/HI 9.6.3.1 standard for Preferred Operating Region (POR) unless otherwise approved by the engineer.
- C. Ensure pump pressure ratings are at least equal to system's maximum operating pressure at point where installed but not less than specified.
- D. Equipment manufacturer shall be a company specializing in manufacture, assembly, and field performance of provided equipment with a minimum of 20 years experience.
- E. Equipment provider shall be responsible for providing certified equipment start-up and, when noted, an in the field certified training session. New pump start-up shall be for the purpose of determining pump alignment, lubrication, voltage, and amperage readings. All proper electrical connections, pump's balance, discharge and suction gauge readings, and adjustment of head, if required. A copy of the start-up report shall be made and sent to both the contractor and to the Engineer.

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1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the site in such a manner as to protect the materials from shipping and handling damage. Provide materials on factory provided shipping skids and lifting lugs if required for handling. Materials damaged by the elements should be packaged in such a manner that they could withstand short-term exposure to the elements during transportation.
- B. Store materials in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage.
- C. Use all means necessary to protect equipment before, during, and after installation.
- D. All scratched, dented, and otherwise damaged units shall be repaired or replaced as directed by the Engineer.

1.08 WARRANTY:

- A. Manufacturer shall Warrant all equipment and material of its manufacture against defects in workmanship and material for a period of eighteen (18) months from date of shipment or twelve (12) months from date of start-up, whichever occurs first.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Contractor shall furnish and install new close-coupled vertical inline pump for the chilled water system as indicated on the drawings. Pumps shall be Series e-80 as manufactured by Bell & Gossett under base bid. Acceptable manufacturers shall be Aurora, Taco and Armstrong. The Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:
 - 1. Structural supports for pumps.
 - 2. Piping size and connection/header locations.
 - 3. Electrical power requirements and wire/conduit and overcurrent protection sizes.
 - 4. Pump physical size on plant layout.
 - 5. Site noise considerations.

2.02 COMPONENTS

- A. The pumps shall be close-coupled, inline for vertical or horizontal installation, in cast iron stainless steel fitted construction specifically designed for quiet operation. Suitable standard operations at 225°F and 175 PSIG working pressure. The pump internals shall be capable of being serviced without disturbing piping connections.

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- B. The pumps shall have a solid alloy steel shaft that is integral to the motor. A non-ferrous shaft sleeve shall be employed to completely cover the wetted area under the seal.
- C. The motor bearings shall support the shaft via heavy-duty grease lubricated ball bearings.
- D. Pump shall be equipped with an internally flushed mechanical seal assembly installed in an enlarged tapered seal chamber. Seal assembly shall have a stainless steel housing, Buna bellows and seat gasket, stainless steel spring, and be of a carbon ceramic design with the carbon face rotating against a stationary ceramic face.
- E. Pump shaft shall connect to a stainless steel impeller. Impeller shall be hydraulically and dynamically balanced to Hydraulic Institute Standards ANSI/HI 9.6.4.5-2000. The allowable residual imbalance conforms to ANSI grade 6.3, keyed to the shaft and secured by a stainless steel locking cap screw or nut.
- F. Pump should be designed to allow for true back pull-out access to the pump's working components for ease of maintenance.
- G. Pump volute shall be of a Class 30 cast iron design rated for 175 PSIG with integral cast iron flanges drilled for 125# ANSI companion flanges. Volute shall include gauge ports at nozzles, and vent and drain ports. The volute shall be designed with a base ring matching an ANSI 125# flange that can be used for pump support.
- H. Motors shall meet scheduled horsepower, speed, voltage, and enclosure design. Motors shall have heavy-duty grease lubricated ball bearings to offset the additional bearing loads associated with the closed-coupled pump design. Motors shall be non-overloading at any point on the pump curve and shall meet NEMA specifications.
- I. Pumps shall conform to ANSI/HI 9.6.3.1 standard for Preferred Operating Region (POR).
- J. Pump shall be of a maintainable design and for ease of maintenance should use machine fit parts and not press fit components.
- K. Pump manufacturer shall be ISO-9001 certified.
- L. Each pump shall be factory tested and name-plated before shipment.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Reduction from line size to pump connection size shall be made with eccentric reducers attached to the pump with tops flat to allow continuity of flow.
- C. Furnish and install triple duty valves on the discharge side of all pumps and furnish and install a line size shut-off valve on the suction side of all pumps. Anywhere that 5 straight pipe diameters of pipe cannot be provided on the inlet side of a pump a suction diffuser shall be used to provide appropriate flow distribution into the eye of the pump's impeller.
- D. Provide temperature and pressure gauges as detailed or directed.

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- E. Proper access space around pumps should be left for servicing the component. No less than the minimum recommended by the manufacturer.
- F. Circulating pump shall have sufficient capacity to circulate the scheduled GPM against the scheduled external head (feet) with the horsepower and speed as scheduled and/or as denoted on the drawings. Motors shall be of electrical characteristics as scheduled, denoted and/or as indicated on the plans and specifications. Pump characteristics shall be such that the head of the pump under varying conditions shall not exceed the rated horsepower of the drive motor.
- G. On systems where the final balancing procedure requires the triple duty valve to be throttled more than 25% to attain design flow (on a constant speed pumping system), and no future capacity has been built into the pump, the pump impeller must be trimmed to represent actual system head resistance. The pump provider and engineer of record, based on the balancing contractor's reports, shall determine the final impeller trim diameter.
- H. All piping shall be brought to equipment and pump connections in such a manner so as to prevent the possibility of any loads or stresses being applied to the connections or piping. All piping shall be fitted to the pumps even though piping adjustments may be required after the pipe is installed.

END OF SECTION 236030

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SECTION 236950 - HVAC TEMPERATURE CONTROLS

PART 1 - GENERAL

1.1 SCOPE

- A. The existing Lallie Kemp Medical Center Facility Management System (FMS) is a "Metasys" system manufactured by Johnson Controls, Inc. The FMS and automatic temperature controls for this facility is to interface completely with the existing FMS system. All features and functions of the present system shall be fully supported. It is the responsibility of the contractor to include all required equipment, hardware, licensed software, backup data storage, labor and programming to have a completely installed system. The furnishing and installing of all items required for the FMS and automatic temperature controls system shall be by the Temperature Controls System Installer (TCSI), for a complete and fully operational system. The owner is not responsible for furnishing any licensed software as part of this project. The FMS and automatic temperature controls system shall be complete in all respects including labor, materials, equipment, and services necessary. This system shall be installed and adjusted by mechanics regularly employed by the TCSI. All equipment shall be of the manufacturer's first quality and of the full proportioning type. The complete Temperature Control system shall be a DDC with electronic sensors and electric/electronic actuation of valves and dampers.
- B. The existing Lallie Kemp Medical Center FMS is Johnson Controls, Inc. (JCI) Metasys system. The FMS and all temperature controls for this project shall interface completely with the existing FMS. The FMS shall communicate to the system in the building shall be able to be complete for full control and time schedules. In addition, this system shall use the available campus master graphics package for floor-plan graphics required for this work. This graphics system exists on the workstations on campus. Any specific graphics required by this building, but not presently resident on the master graphics package, shall be created by this Contractor and added to master graphics package for universal use. The format and form of the graphics must match the color, size and format appearance of the existing graphics. Additional workstations, computers, integrators, and servers to facilitate connection to the existing FMS system are not acceptable. Web accessed monitoring and control separate from the existing FMS system licensed software are not permitted as they do not provide a seamless connection into the existing system.
- C. All points and sequences described herein shall be incorporated into the existing FMS at the Lallie Kemp Medical Center main system. All new points shall be made visible and totally controllable by all means allowable through all FMS

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computers. All existing graphics shall be updated to include this projects floor-plans, equipment and control points, to match existing floor-plan graphics utilized for other buildings on campus. Graphics shall be updated on all computers where graphics are located.

- D. Uploads and downloads of controllers shall be able to be performed at any existing workstation or from any network panel. Twenty-four hour point history shall be available for all points simply by double clicking the mouse on designated point. Scheduling of any point on the system shall be available from any workstation. All workstations shall be updated to display new network maps with new buildings, equipment, and points.
- E. Each primary device (air handler, VAV boxes etc) shall have individual controllers. Grouping of equipment on one controller will not be acceptable.
- F. Installation of a new operator workstation, server, software (other than licensed updates noted below), programming tools, integrator panel and graphics package for this project is not acceptable.
- G. Contractor shall be responsible for updating licensed software (to the current version) and programming, as applicable, setup of schedules, trends, logs and alarms and connections.
- H. All wiring required in the control system and all interlocking motor control wiring and start-stop control wiring shall be furnished and installed as part of the work of this section. The control system shall include all interconnecting wiring and conduit as required for a fully operational system as specified. All line voltage wiring and low voltage wiring shall utilize methods and materials complying with the requirements of the Electrical Specifications.
- I. The control system shall consist of all thermostats, valves, dampers, transformers, relays and other necessary equipment to provide controls for all phases of the cooling, heating and ventilating systems as required; refer to drawings for additional requirements.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Where work specified under other Sections of these Specifications connects to equipment or systems which are a part of this section, provide proper connection(s) to such equipment including trade coordination. The following sections may have direct links to the installation of the FMS system:
 - 1. Section 15010 - General Conditions
 - 2. Section 15600 - HVAC

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1.3 QUALITY ASSURANCE

A. General:

1. The Facility Management System herein specified shall be fully integrated and installed as a complete package by the TCSI. The System shall include all wiring, piping, installation supervision, calibration, adjustments, and checkout necessary for a complete and fully operational system.
2. The TCSI shall be a factory authorized agency that is regularly engaged in the engineering, programming, installation and service of Facility Management Systems of similar size and complexity. The FMS supplier shall have a support facility within 25 miles of the site with technical staff, spare parts, and all necessary test/diagnostic equipment. The FMS supplier shall have a minimum of 10 years installation experience. Bids by wholesalers and non-franchised contractors shall not be acceptable.
3. The TCSI shall have a local branch facility. Emergency service shall be available on a 24-hour, 7-day-a-week basis.
4. The TCSI shall be responsible for all work fitting into place in a satisfactory and neat workmanlike manner acceptable to the Owner/Architect/Engineer.
5. The TCSI will coordinate with other trades regarding the location and size of pipes, equipment, fixtures, conduit, ducts, openings, switches, outlets, and so forth, in order to eliminate any delays in the progress of the job.

B. Experience Record:

1. The TCSI shall have experience with the complete, turnkey installation of Facility Management Systems of similar size and technical complexity.
2. The TCSI shall employ specialists in the field of Facility Management Systems including: Programming, Engineering, Field Supervision, and Installation. Specialists shall have experience with Facility Management Systems.

C. Products:

1. The Facility Management System architecture shall consist of the products of a manufacturer regularly engaged in the production of Facility Management Systems, and shall be the manufacturer's latest standard of design. Controllers and DDC (Direct Digital Control) system components shall be current production products.
2. All other equipment shall be the products of the FMS manufacturers or of an approved manufacturer regularly engaged in production of

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- specialized Facility Management System materials or equipment.
3. Following is a list of acceptable Manufacturers: Johnson Controls, Inc Metasys by local New Orleans branch office Contact Mike DiVincent @ 228-363-2238

1.4 WORK INCLUDED

- A. Installation of Facility Management System (FMS):
1. The TCSI shall furnish and install a complete Facility Management System (FMS) for all mechanical systems and other facility systems as included in the project documents. The FMS will provide the functional features as defined in these Specifications. The TCSI shall provide a complete and operational system to perform all sequences of operations stated within or shown on the drawings.
 2. In addition, the following apply:
 - a. The work under this Section shall include all materials and labor to perform all work required for the installation of the TCSI as specified.
 - b. The drawings and Specifications are complementary to one another—meaning that what is called for on one is to be considered called for in both. Where conflicts exist between the Specifications and/or drawings, the more stringent requirement shall apply.
 - c. The TCSI shall be responsible for field verification of site conditions and for gathering all necessary field data for all items to be provided under this contract prior to submitting his or her bid.
 - d. Where work specified under other Sections of this Specification connects to equipment or systems that are listed and described in this Section, the TCSI shall provide proper connection(s) to such equipment, including trade coordination.

1.5 SUBMITTALS

- A. Shop Drawings, Product Data, and Samples:
1. The TCSI shall submit within 60 days after award installation drawings and control strategies for review. During the submittal phase, the TCSI shall provide detailed diagrams to demonstrate the connection being used for communicating with the existing FMS Metasys system.
 2. Each submittal shall have a cover sheet with the following information provided: submittal ID number; date; project name, address, and title; TCSI name, address and phone number; TCSI project manager, quality control manager, and project engineer names and phone numbers.

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3. Each submittal shall include the following information.
 - a. FMS riser diagram showing all DDC controllers, operator workstations, network repeaters, and network wiring.
 - b. One-line schematics and system flow diagrams showing the location of all control devices.
 - c. Points list for each DDC controller, including: Tag, Point Type, System Name, Object Name, Expanded ID, Display Units, Controller Type, Address, Cable Destination, Module Type, Terminal ID, Panel, Slot Number, Reference Drawing, and Cable Number.
4. Vendor's own written description for each sequence of operations, to include the following:
 - a. Sequences shall reference input/output and software parameters by name and description.
 - b. The sequences of operations provided in the submittal by the TCSI shall represent the detailed analysis needed to create actual programming code from the design documents.
 - c. Points shall be referenced by name, including all software points such as programmable setpoints, range limits, time delays, and so forth.
 - d. The sequence of operations shall cover normal operation and operation under the various alarm conditions applicable to that system.
 - e. User interface functional outline. The outline shall include each display screen to be provided, data to be displayed, and links to other screens. The outline level hierarchy shall be:
 - 1) Site
 - 2) Building
 - 3) Floor
 - 4) System
 - f. Detailed Bill of Material list for each panel, identifying: quantity, part number, description, and associated options.
 - g. Control Damper Schedules. This spreadsheet type schedule shall include a separate line for each damper and a column for each of the damper attributes, including: Code Number, Fail Position, Damper Type, Damper Operator, Blade Type, Bearing Type, Seals, Duct Size, Damper Size, Mounting, and Actuator Type.
 - h. Control Valve Schedules. This spreadsheet type schedule shall include a separate line for each valve and a column for each of the valve attributes, including: Code Number, Configuration, Fail Position, Pipe Size, Valve Size, Body Configuration, Close off Pressure, Capacity, Valve CV, Calc CV, Design Pressure, Actual Pressure, and Actuator Type.

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- i. Cataloged cut sheets of all equipment used. This includes, but is not limited to, the following: DDC panels, peripherals, sensors, actuators, dampers, control air system components, and so forth.
 - j. Range and scale information for all transmitters and sensors. This sheet shall clearly indicate one device and any applicable options. Where more than one device to be used is on a single sheet, submit two sheets, individually marked.
 - k. Hardware data sheets for all operator workstations, local access panels, and portable operator terminals.
 - l. Licensed software manuals for all applications programs to be provided as a part of the operator workstations, portable operator terminals, programming devices, and so forth for evaluation for compliance with the performance requirements of this Specification.
 - m. Initial project team Quality Assurance compliance report.
5. TCSI shall not order material or begin fabrication or field installation until receiving authorization to proceed in the form of an approved submittal. TCSI shall be solely responsible for the removal and replacement of any item not approved by submittal at no cost to the Owner.

1.6 O&M MANUALS

- A. Submit three sets of each manual.
- B. Include the following documentation in the Hardware Manual:
 1. General description and cut sheets for all components.
 2. Detailed wiring and installation illustrations and complete calibration procedures for each field and panel device.
 3. Complete trouble-shooting procedures and guidelines.
 4. Complete operating instructions for all systems.
 5. Maintenance Instructions: Document all maintenance and repair/replacement procedures.
- C. Include the following documentation in the DDC Software Manual:
 1. Sequence of Operations
 2. Program Listing of Software Source Code OR Flow Chart Diagrams of Programming Objects.
 3. Printed listing of controller and operator workstation database files.
 4. Software Point Name Abbreviation List.. Include Name, Description, Controller Where Located, Point Type and Point ID.
 5. I/O Point List. Include Point Name, Controller Location, Point Number, Control Device, Range and Span.

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6. Printouts of all; Reports, Group Listings and Alarm Messages.
 7. Index of all DDC point names with documentation manual page number references.
- D. Provide three copies of all manufacturers manuals covering the installed system. This shall include, as a minimum:
1. System Engineering Manual
 2. System Installation Manual
 3. Programming Manual
 4. Engineering and Troubleshooting Bulletins
 5. Operator Workstation Licensed software Manual
 6. All other pertinent manuals published by the control system manufacturer.
- E. All manuals shall be provided in hard copy format or on a single Compact Disk (CD) as part of an on-line documentation system through the operator workstation.
- F. Record Drawings (i.e., control diagrams/schematics updated for As-Built conditions).

1.7 WARRANTY

- A. **Material:** The Control System shall be free from defects in material and workmanship under normal use and service. If within twelve (12) months from the date of acceptance any of the equipment herein described is defective in operation, workmanship or materials, it will be replaced, repaired or adjusted at the option of the TCSI free of charge.
- B. **Installation:** The Control System shall be free from defects in installation workmanship for a period of one year from acceptance. The TCSI shall, free of charge, correct any defects in workmanship within one week of notification in writing by the Owner.

PART 2 – PRODUCTS

2.1 GENERAL PRODUCT DESCRIPTION

- A. The existing Metasys Facility Management System (FMS) shall integrate multiple building functions including equipment supervision and control, alarm management, energy management, information management, and historical data collection and archiving. The use of additional servers, computers, and

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workstations is unacceptable. FMS licensed software shall be updated to latest version at project completion.

- B. The facility management system shall consist of the following:
 - 1. Standalone Network Controllers
 - 2. Application specific controllers (HVAC etc.)
 - 3. Networked Thermostats
- C. The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, Network Controllers (see Network Controllers below), and operator devices, while re-using existing controls equipment.
- D. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each Network Controller shall operate independently by performing its own specified control, alarm management, operator I/O, and historical data collection. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.
- E. Network Controllers shall be able to access any data from, or send control commands and alarm reports directly to any other Network Controller or combination of panels on the network without dependence upon a central processing device, such as a central file server. Network Controllers shall also be able to send alarm reports to multiple operator workstations, terminals, and printers without dependence upon a central processing device or File Server.

2.2 SYSTEM ARCHITECTURE AND NETWORK CONTROL PANELS

- A. Network:
 - 1. The first tier network shall be based on a PC industry standard of Ethernet TCP/IP. PC Workstation LAN controller cards shall be standard “off the shelf” products available through normal PC vendor channels.
 - 2. The FMS shall network multiple operator workstations, network controllers, system controllers, and application-specific controllers. The first tier network shall provide communications between operator workstations and first tier DDC (Direct Digital Control) controllers.
 - 3. All FMS devices on the network shall be capable of communicating at a communication speed of 100Mbps, with full peer to peer network communication.
 - 4. Network Controllers shall reside on the first tier.
 - 5. The first tier network will be compatible with other facility-wide networks. The first tier shall be connected to a facility network by way of

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- standard networking practices.
6. Second tier networks shall provide either “Peer-to-Peer,” Master-Slave, IEEE802.15.4, Supervised Token Passing communications, wireless, and shall operate at a minimum communication speed of 9600 baud.
- B. Network Control Panel:
1. The Network Control Panel (NCP) shall be a fully user-programmable, supervisory controller. The NCP shall monitor the network of distributed application-specific controllers, provide global strategy and direction, and communicate on a peer-to-peer basis with other Network Automation Engines.
 2. Automation network – The NCP shall reside on the automation network and shall support a subnet of system controllers.
 3. User Interface (UI) – All computers connected physically or virtually to the automation network shall have access to the UI. Systems that require a local copy of the system database on the user’s personal computer are not acceptable. The NCP shall support concurrent users. The user shall have the capability to access all system data through one NCP. Systems that require the user to address more than one NCP to access all system information are not acceptable.
 4. Systems that support UI Graphics from a central database or require the graphics to reside on the user’s personal computer are not acceptable.
 5. The UI shall support the following functions:
 - a. Configuration
 - b. Commissioning
 - c. Data Archiving
 - d. Monitoring
 - e. Commanding
 - f. System Diagnostics
 6. Systems that require workstation software or modified web browsers are not acceptable.
 7. The NCP shall allow temporary use of portable devices without interrupting the normal operation of permanently connected modems.
 8. Processor – The NCP shall be microprocessor-based with a minimum word size of 32 bits. The NCP shall be a multi-tasking, multi-user, and real-time digital control processor. Standard operating systems shall be employed. NCP size and capability shall be sufficient to fully meet the requirements of this Specification.
 9. Memory – Each NCP shall have sufficient memory to support its own operating system, databases, and control programs, and to provide supervisory control for all control level devices.
 10. Hardware Real Time Clock – The NCP shall include an integrated, hardware-Based, real-time clock.

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11. The NCP shall include troubleshooting LED indicators to identify the following conditions:
 - a. Power - On/Off
 - b. Ethernet Connection Speed – 10 Mbps/100 Mbps
 - c. Peer Communication – Data Traffic between NCP Devices
 - d. Run – NCP Running/NCP in Startup/NCP Shutting Down/Software Not Running
 - e. Bat Fault – Battery Defective, Data Protection Battery Not Installed
 - f. Fault – General Fault
12. Communications Ports – The NCP shall provide the following ports for operation of operator Input/Output (I/O) devices, such as industry-standard computers, modems, and portable operator’s terminals.
 - a. USB port
 - b. RS-232 serial data communication port
 - c. RS-485 port
 - d. Ethernet port
13. Diagnostics – The NCP shall continuously perform self-diagnostics, communication diagnosis, and diagnosis of all panel components. The Network Automation Engine shall provide both local and remote annunciation of any detected component failures, low battery conditions, or repeated failures to establish communication.
14. Power Failure – In the event of the loss of normal power, The NCP shall continue to operate for a user adjustable period of up to 10 minutes after which there shall be an orderly shutdown of all programs to prevent the loss of database or operating system software. During a loss of normal power, the control sequences shall go to the normal system shutdown conditions. All critical configuration data shall be saved into Flash memory. Upon restoration of normal power and after a minimum off-time delay, the controller shall automatically resume full operation without manual intervention through a normal soft-start sequence.
15. Certification – The NCP shall be listed by Underwriters Laboratories (UL).

2.3 OPERATOR INTERFACE – PLATFORMS - EXISTING

- A. The present campus FMS has existing Metasys workstation(s) for command entry, information management, network alarm management, database management functions and all real-time control functions, including scheduling, history collection and alarming that shall be utilized for this project. Installation of a new PC workstation and/or new software for monitoring and controlling this building is not acceptable. Communication between building control panels and all workstations shall be over a high speed network. Application specific

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controllers shall be constantly scanned by the building's Network Control Panel(s) (NCP) to update point and alarm information. The Johnson Controls Metasys system (licensed software/hardware/graphics) shall remain in service and not be replaced and shall be updated to the current revision level at project completion.

- B. TCSI shall update existing control application and graphics licensed software to include the new equipment and control points required for the equipment in this project. Provide dynamic floor-plan graphics for all systems.
- C. Provide a new current model laptop for local troubleshooting and access to the system

2.4 DDC SYSTEM CONTROLLERS

- A. Standalone DDC Panels:
 - 1. Standalone DDC panels shall be microprocessor-based, multi-tasking, multi-user, real-time digital control processors. Each standalone DDC panel shall consist of modular hardware with plug-in enclosed processors, communication controllers, power supplies, and input/output modules. A sufficient number of controllers shall be supplied to fully meet the requirements of this Specification and the attached point list.
 - 2. Point types – Each DDC panel shall support the following types of point inputs and outputs:
 - a. Analog inputs shall monitor the following analog signals:
 - 1) 4-20 mA Sensors
 - 2) 0-10 VDC Sensors
 - 3) 1000ohm RTDs
 - b. Binary inputs shall monitor dry contact closures. Input shall provide filtering to eliminate false signals resulting from input “bouncing.”
 - c. Counter inputs shall monitor dry contact pulses with an input resolution of one HZ minimum.
 - d. Analog outputs shall provide the following control outputs:
 - 1) 4.20 mA – Sink or Source
 - 2) 0-10 VDC
 - e. Binary outputs shall provide SPDT output contacts rated for 2 amps at 24 VAC. Surge and noise suppression shall be provided on all pilot relays. Inductive loads (i.e. solenoids) shall be controlled by pilot relays.
 - f. TriState outputs shall be paired binary outputs for use as Power Close/Power Open control output contacts rated for 2 amps at 24 VAC. Surge and noise suppression shall be provided on all pilot

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- relays.
- g. Pneumatic outputs shall provide a 3-15 PSI pneumatic output. Gradual override capability and output pressure gauge shall be provided.
- 3. All DDC controllers shall communicate via N2 protocol or BacNet MSTP. Bacnet IP is not acceptable.

2.5 APPLICATION SPECIFIC CONTROLLERS

- A. Expanded Digital Controller (EDC):
 - 1. Each EDC shall operate as a hardwired standalone controller capable of performing its specified control responsibilities independently of other controllers in the network. Each EDC shall be a microprocessor-based, multi-tasking, real-time digital control processor.
 - 2. EDC controllers shall support, but not be limited to, the following configurations of systems to address current requirements described in the “Execution” portion of this Specification, and to address future expansion.
 - a. Single boiler or chiller plants with pump logic.
 - b. Cooling towers.
 - c. Air handling units.
 - d. Zone pressurization of labs.
 - e. Generic system interlocking through hardware.
 - 3. Point types – Each EDC shall support the following types of point inputs and outputs:
 - a. Analog inputs shall monitor the following analog signals:
 - 1) 4-20 mA Sensors
 - 2) 0-10 VDC Sensors
 - 3) 1000ohm RTDs
 - b. Binary inputs shall monitor dry contact closures. Input shall provide filtering to eliminate false signals resulting from input “bouncing.”
 - c. Counter inputs shall monitor dry contact pulses with an input resolution of one HZ minimum.
 - d. Analog outputs shall provide the following control outputs:
 - 1) 4.20 mA – Sink or Source
 - 2) 0-10 VDC
 - e. Binary outputs shall provide SPDT output contacts rated for 2 amps at 24 VAC. Surge and noise suppression shall be provided on all pilot relays. Inductive loads (i.e. solenoids) shall be controlled by pilot relays.
 - f. TriState outputs shall be paired binary outputs for use as Power Close/Power Open control output contacts rated for 2 amps at 24

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- VAC. Surge and noise suppression shall be provided on all pilot relays.
- g. Pneumatic outputs shall provide a 3-15 PSI pneumatic output. Gradual override capability and output pressure gauge shall be provided.
- 4. EDC controllers shall have a built-in status, and adjust panel interface to allow for the local adjustment of all setpoints, temporary override of any input or output points, and status of any points in alarm.
 - 5. Powerfail Protection – All system setpoints, proportional bands, control algorithms, and any other programmable parameters shall be stored such that a power failure of any duration does not necessitate reprogramming the EDC.
 - 6. The capability to extend the input and output capacity of the EDC via Point Expansion Modules shall be provided.
 - a. The Point Expansion Modules shall communicate to the EDC controller over a local RS-485 expansion bus.
 - b. The Point Expansion Modules shall have available a range of configurations of 4, 8, 12, or 16 data points:
 - 1) Analog Inputs – 0-10V, 4-20mA, 1000 ohm RTD
 - 2) Analog Outputs – 0-10V, 4-20mA
 - 3) Digital Inputs w/ digital counter
 - 4) Digital Outputs – triacs or relay contacts
 - c. Expansion module data points shall be available for inclusion in all EDC control strategies.
- B. Unitary Controllers (UNT):
- 1. Each Unitary Controller shall operate as a standalone hardwired controller capable of performing its specified control responsibilities independently of other controllers in the network. Each Unitary Controller shall be a microprocessor-based, multi-tasking, real-time digital control processor.
 - 2. Unitary Controllers shall support, but not be limited to, the following types of systems to address specific applications described in the “Execution” portion of this Specification, and to address future expansion:
 - a. Unit Vents (ASHRAE Cycle, I, II, III, or W).
 - b. Heat Pumps (Air-to-Air, Water-to-Air).
 - c. Packaged Rooftops.
 - d. Fan Coils (Two-Pipe, Four-Pipe).
 - 3. Point types – Each Unitary Controller shall support the following types of point inputs and outputs:
 - a. Analog inputs shall monitor the following analog signals:
 - 1) 0-10 VDC Sensors

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- 2) 1000ohm RTDs
 - b. Binary inputs shall monitor dry contact closures. Input shall provide filtering to eliminate false signals resulting from input “bouncing.”
 - c. Counter inputs shall monitor dry contact pulses with an input resolution of one HZ minimum.
 - d. Analog outputs shall provide the following control outputs:
 - 1) 0-10 VDC
 - e. Binary outputs shall provide SPDT output contacts rated for 2 amps at 24 VAC. Surge and noise suppression shall be provided on all pilot relays. Inductive loads (i.e. solenoids) shall be controlled by pilot relays.
 - f. TriState outputs shall be paired binary outputs for use as Power Close/Power Open control output contacts rated for 2 amps at 24 VAC. Surge and noise suppression shall be provided on all pilot relays.
 - g. Pneumatic outputs shall provide a 3-15 PSI pneumatic output. Gradual override capability and output pressure gauge shall be provided.
 4. Unitary Controllers shall have control routines and program logic to perform the sequence of operations specified in the “Execution” portion of this Specification.
 5. Unitary Controllers shall directly support the temporary use of a portable service terminal that can be connected to the UNT via zone temperature or directly at the controller.
 6. Powerfail Protection – All system setpoints, proportional bands, control algorithms, and any other programmable parameters shall be stored such that a power failure of any duration does not necessitate reprogramming the UNT.
- C. Networked Thermostats:
1. Each networked thermostat shall operate as a standalone device capable of performing its specified control responsibilities independently of other controllers in the network. Each networked thermostat shall be a microprocessor-based, multi-tasking, digital control device.
 2. The Networked Thermostats shall be N2 or Bacnet MSTP compatible networked devices that provide control of two- or four-pipe fan coils, cabinet unit heaters, or other equipment using on/off, floating, or proportional 0 to 10 VDC control input, three speeds of fan control, and dehumidification capability. The thermostats feature a FMS Bus communication capability that enables remote monitoring and programmability for efficient space temperature control.
 3. The thermostats feature an intuitive user interface with backlit display

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that makes setup and operation quick and easy. The thermostats also employ a unique, Proportional-Integral (PI) time-proportioning algorithm that virtually eliminates temperature offset associated with traditional, differential-based thermostats.

2.6 SOFTWARE PROGRAMMING/TOOLS

A. Program Editor:

1. Existing programming tools shall be utilized for new controllers installed on this project.
2. Definition of operator device characteristics, DDC panels, individual points, applications, and control sequences shall be performed through fill-in-the-blank templates and a graphical programming approach.
3. All temperature and equipment control strategies and energy management routines shall be definable by the operator. System definition and modification procedures shall not interfere with normal system operation and control.
4. The programming environment shall provide context-sensitive help menus and instructions for each operation and/or application currently being performed, for all programming functions, and for the programming language itself.
5. Selection of a single menu item or tool bar button shall print any displayed program on the system printer or to a text archive file. For source code orientated languages, formatted text printouts shall be provided. For graphical object orientated languages, program flow charts of objects shall be provided, and shall include links between objects and parameter values.
6. Libraries of standard application modules shall be provided, such as temperature, humidity, and static pressure control. These modules may be used as “building blocks” in defining or creating new control sequences. In addition, the user shall have the capability to easily create and archive new modules and control sequences, as desired, via a word processing type format or visual object configuration type format.
7. A library of standard forms designed to facilitate definition of point characteristics shall be provided. Forms shall be self-prompting and incorporate a fill-in-the-blank approach for definition of all parameters. The system shall immediately detect an improper entry, and automatically display an error message explaining the nature of the mistake.
8. A licensed software tool shall be provided that allows a user to simulate control sequence execution and test strategies before they are actually applied to mechanical systems. Users shall be able to enter hypothetical input data and verify desired control response and calculation results via

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- graphical displays and hardcopy printouts.
9. The capability to backup and store all system databases on the workstation hard disk shall be provided. In addition, all database changes shall be performed while the workstation is on-line without disrupting other system operations.
 10. Database changes shall be recorded and downloaded to the appropriate controllers. The user shall also have the option to selectively download changes as desired.
 11. A network, serial, or parallel port data connection shall be provided for the portable operator terminal to update its system database when specifically connected and activated by an operator.
 12. A text-based programming language shall be provided to allow the user to define the licensed software configuration of DDC control logic for HVAC system control sequences, fan interlocks, pump interlocks, PID control loops, and other control relationships. The programming language shall conform to ANSI Basic. It shall be possible to edit and compile a program off-line, and upload or download the compiled program on-line.

2.7 INPUT DEVICES

A. General Requirements:

1. Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements.

B. Temperature Sensors:

1. General Requirements:

- a. Sensors and transmitters shall be provided, as outlined in the input/output summary and sequence of operations.
- b. The temperature sensor shall be of the resistance type, and shall be either two-wire 1000 ohm nickel RTD, or two-wire 1000 ohm platinum RTD.
- c. The following point types (and the accuracy of each) are required, and their associated accuracy values include errors associated with the sensor, lead wire, and A to D conversion:

Point Type	Accuracy
Chilled Water	+ .5°F
Room Temp	+ .5°F
Duct Temperature	+ .5°F.
All Others	+ .75°F.

2. Room Temperature Sensors:

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- a. Room sensors shall be constructed for either surface or wallbox mounting.
 - b. Room sensors shall have the following options when specified:
 - 1) Setpoint reset slide switch providing a +3 degree (adjustable) range.
 - 2) Individual heating/cooling setpoint slide switches.
 - 3) A momentary override request push button for activation of after-hours operation.
 - 4) Analog thermometer.
3. Room Temperature Sensors with Integral Display:
- a. Room sensors shall be constructed for either surface or wallbox mounting.
 - b. Room sensors shall have an integral LCD display and four button keypad with the following capabilities:
 - 1) Display room and outside air temperatures.
 - 2) Display and adjust room comfort setpoint.
 - 3) Display and adjust fan operation status.
 - 4) Timed override request push button with LED status for activation of after-hours operation.
 - 5) Display controller mode.
 - 6) Password selectable adjustment of setpoint and override modes.
4. Outside Air Sensors:
- a. Outside air sensors shall be designed to withstand the environmental conditions to which they will be exposed. They shall also be provided with a solar shield.
 - b. Sensors exposed to wind velocity pressures shall be shielded by a perforated plate that surrounds the sensor element.
 - c. Temperature transmitters shall be of NEMA 3R construction and rated for ambient temperatures.
5. Duct Mount Sensors:
- a. Duct mount sensors shall mount in an electrical box through a hole in the duct, and be positioned so as to be easily accessible for repair or replacement.
 - b. Duct sensors shall be insertion type and constructed as a complete assembly, including lock nut and mounting plate.
 - c. For outdoor air duct applications, a weatherproof mounting box with weatherproof cover and gasket shall be used.
6. Averaging Sensors:
- a. For ductwork greater in any dimension than 48 inches and/or where air temperature stratification exists, an averaging sensor with multiple sensing points shall be used.
 - b. For plenum applications, such as mixed air temperature

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measurements, a string of sensors mounted across the plenum shall be used to account for stratification and/or air turbulence. The averaging string shall have a minimum of 4 sensing points per 12-foot long segment.

- c. Capillary supports at the sides of the duct shall be provided to support the sensing string.

C. Humidity Sensors:

1. The sensor shall be a solid state type, relative humidity sensor of the Bulk Polymer Design. The sensor element shall resist service contamination.
2. The humidity transmitter shall be equipped with non-interactive span and zero adjustments, a 2-wire isolated loop powered, 4-20 mA, 0-100% linear proportional output.
3. The humidity transmitter shall meet the following overall accuracy, including lead loss and Analog to Digital conversion. [more information]
4. Outside air relative humidity sensors shall be installed with a rain proof, perforated cover. The transmitter shall be installed in a NEMA 3R enclosure with sealtite fittings and stainless steel bushings.
5. A single point humidity calibrator shall be provided, if required, for field calibration. Transmitters shall be shipped factory pre-calibrated.
6. Duct type sensing probes shall be constructed of 304 stainless steel, and shall be equipped with a neoprene grommet, bushings, and a mounting bracket.

D. Differential Pressure Transmitters:

1. General Air and Water Pressure Transmitter Requirements:
 - a. Pressure transmitters shall be constructed to withstand 100% pressure over-range without damage, and to hold calibrated accuracy when subject to a momentary 40% over-range input.
 - b. Pressure transmitters shall transmit a 0 to 5 VDC, 0 to 10 VDC, or 4 to 20 mA output signal.
 - c. Differential pressure transmitters used for flow measurement shall be sized to the flow sensing device, and shall be supplied with Tee fittings and shut-off valves in the high and low sensing pick-up lines to allow the Test and Balance Agency and Owner permanent, easy-to-use connection.
 - d. A minimum of a NEMA 1 housing shall be provided for the transmitter. Transmitters shall be located in accessible local control panels wherever possible.
2. Low Differential Water Pressure Applications (0" - 20" w.c.):
 - a. The differential pressure transmitter shall be of industrial quality and transmit a linear, 4 to 20 mA output in response to variation

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- of flow meter differential pressure or water pressure sensing points.
- b. The differential pressure transmitter shall have non-interactive zero and span adjustments that are adjustable from the outside cover and meet the following performance specifications:
 - 1) .01-20" w.c. input differential pressure range.
 - 2) 4-20 mA output.
 - 3) Maintain accuracy up to 20 to 1 ratio turndown.
 - 4) Reference Accuracy: +0.2% of full span.
 - c. Medium to High Differential Water Pressure Applications (Over 21" w.c.):
 - 1) The differential pressure transmitter shall meet the low pressure transmitter specifications with the following exceptions:
 - a) Differential pressure range 10" w.c. to 300 PSI.
 - b) Reference Accuracy: +1% of full span (includes non-linearity, hysteresis, and repeatability).
 - 2) Standalone pressure transmitters shall be mounted in a bypass valve assembly panel. The panel shall be constructed to NEMA 1 standards. The transmitter shall be installed in the panel with high and low connections piped and valved. Air bleed units, bypass valves, and compression fittings shall be provided.
 - d. Building Differential Air Pressure Applications (-1" to +1" w.c.):
 - 1) The differential pressure transmitter shall be of industrial quality and transmit a linear, 4 to 20 mA output in response to variation of differential pressure or air pressure sensing points.
 - 2) The differential pressure transmitter shall have non-interactive zero and span adjustments that are adjustable from the outside cover and meet the following performance specifications:
 - a) -1.00 to +1.00 w.c. input differential pressure ranges. (Select range appropriate for system application)
 - b) 4-20 mA output.
 - c) Maintain accuracy up to 20 to 1 ratio turndown.
 - d) Reference Accuracy: +0.2% of full span.
- E. Smoke Detectors:
- 1. Ionization type air duct detectors shall be furnished as specified elsewhere in Division 15 for installation under this Division. All wiring

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for air duct detectors shall be provided under this Division, Fire Alarm System.

- F. Status and Safety Switches:
1. General Requirements:
 - a. Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the FMS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts and shall be interlock wired to shut down respective equipment.
 2. Current Sensing Switches:
 - a. The current sensing switch shall be self-powered with solid state circuitry and a dry contact output. It shall consist of a current transformer, a solid state current sensing circuit, adjustable trip point, solid state switch, SPDT relay, and an LED indicating the on or off status. A conductor of the load shall be passed through the window of the device. It shall accept over-current up to twice its trip point range.
 - b. Current sensing switches shall be used for run status for fans, pumps, and other miscellaneous motor loads.
 - c. Current sensing switches shall be calibrated to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.
 3. Air Filter Status Switches:
 - a. Differential pressure switches used to monitor air filter status shall be of the automatic reset type with SPDT contacts rated for 2 amps at 120VAC.
 - b. A complete installation kit shall be provided, including: static pressure tops, tubing, fittings, and air filters.
 - c. Provide appropriate scale range and differential adjustment for intended service.
 4. Air Flow Switches:
 - a. Differential pressure flow switches shall be bellows actuated mercury switches or snap acting micro-switches with appropriate scale range and differential adjustment for intended service.
 5. Air Pressure Safety Switches:
 - a. Air pressure safety switches shall be of the manual reset type with SPDT contacts rated for 2 amps at 120VAC.
 - b. Pressure range shall be adjustable with appropriate scale range and differential adjustment for intended service.
 6. Low Temperature Limit Switches:
 - a. The low temperature limit switch shall be of the manual reset

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- type with Double Pole/Single Throw snap acting contacts rated for 16 amps at 120VAC.
 - b. The sensing element shall be a minimum of 15 feet in length and shall react to the coldest 18-inch section. Element shall be mounted horizontally across duct in accordance with manufacturers recommended installation procedures.
 - c. For large duct areas where the sensing element does not provide full coverage of the air stream, additional switches shall be provided as required to provide full protection of the air stream.
 - 7. High Limit Thermostats:
 - a. High limit thermostats (firestats) shall be furnished and installed in the inlet air stream of each air moving device handling more than 600 CFM (with manual reset). Thermostats shall turn off the fans if the inlet temperature exceeds 125°F.
- G. Occupancy Sensors:
 - 1. Sensor Switch CM-PDT Series or equal, low voltage ceiling mounted sensor, complete with power supply, isolated relay and all accessories required for the application. Sensor shall have adjustable time delay and 360 degree coverage.
- H. Supply Air Flow Control Modules:
 - 1. Air Flow Control Modules shall be capable of direct measurement of airflow through the supply air duct and produce dual outputs; one representing the measured airflow, and the other to control the Variable Frequency Drive (VFD).
 - 2. Air Flow Control Modules shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.
 - 3. Air Flow Control Modules shall measure inlet airflow with an accuracy of $\pm 5\%$ of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.
 - 4. Air Flow Control Modules shall interface with the building automation systems (BMCS), accepting inputs for fan system start and an external controller setpoint, and provide flow deviation alarm outputs.
 - 5. The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. Sensors shall be factory mounted in an

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airflow station constructed of a 14 ga. galvanized steel, 6" deep welding casing with 90° connecting flanges and a galvanized expanded metal sheet. The electronics enclosure shall be NEMA 4

6. Air Flow Control Modules shall be as manufactured by Johnson Controls INC or equal.

2.8 OUTPUT DEVICES

A. Actuators:

1. General Requirements: Damper actuators shall be electronic as specified in the System Description section.
2. Electronic Damper Actuators:
 - a. Electronic damper actuators shall be direct shaft mount.
 - b. Modulating and two-position actuators shall be provided as required by the sequence of operations. Damper sections shall be sized based on actuator manufacturer's recommendations for face velocity, differential pressure and damper type. The actuator mounting arrangement and spring return feature shall permit normally open or normally closed positions of the dampers, as required. All actuators (except terminal units) shall be furnished with mechanical spring return unless otherwise specified in the sequences of operations. All actuators shall have external adjustable stops to limit the travel in either direction, and a gear release to allow manual positioning.
 - c. Modulating actuators shall accept 24 VAC or VDC power supply, consume no more than 15 VA, and be UL listed. The control signal shall be 2-10 VDC or 4-20 mA, and the actuator shall provide a clamp position feedback signal of 2-10 VDC. The feedback signal shall be independent of the input signal and may be used to parallel other actuators and provide true position indication. The feedback signal of one damper actuator for each separately controlled damper shall be wired back to a terminal strip in the control panel for trouble-shooting purposes.
 - d. Two-position or open/closed actuators shall accept 24 or 120 VAC power supply and be UL listed. Isolation, smoke, exhaust fan, and other dampers, as specified in the sequence of operations, shall be furnished with adjustable end switches to indicate open/closed position or be hard wired to start/stop associated fan. Two-position actuators, as specified in sequences of operations as "quick acting," shall move full stroke within 20 seconds.

B. Control Dampers:

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1. The TCSI shall furnish all automatic dampers. All automatic dampers shall be sized for the application by the FMS Contractor or as specifically indicated on the Drawings.
 2. All dampers used for throttling airflow shall be of the opposed blade type arranged for normally open or normally closed operation, as required. The damper is to be sized so that, when wide open, the pressure drop is a sufficient amount of its close-off pressure drop to shift the characteristic curve to near linear.
 3. All dampers used for two-position, open/close control shall be parallel blade type arranged for normally open or closed operation, as required.
 4. Damper frames and blades shall be constructed of either galvanized steel or aluminum. Maximum blade length in any section shall be 48". Damper blades shall be 16-gauge minimum and shall not exceed six (6) inches in width. Damper frames shall be 16-gauge minimum hat channel type with corner bracing. Additional stiffening or bracing shall be provided for any section exceeding 48" in height. All damper bearings shall be made of stainless steel or oil-impregnated bronze. Dampers shall be tight closing, low leakage type, with synthetic elastomer seals on the blade edges and flexible stainless steel side seals. Dampers of 48"x 48" size shall not leak in excess of 8.5 cfm per square foot when closed against 4" w.g. static pressure when tested in accordance with AMCA Std. 500.
 5. Air foil blade dampers of double skin construction with linkage out of the air stream shall be used whenever the damper face velocity exceeds 1500 FPM or system pressure exceeds 2.5" w.g., but no more than 4000 FPM or 6" w.g.
 6. One piece rolled blade dampers with exposed or concealed linkage may be used with face velocities of 1500 FPM or below.
 7. Multiple section dampers may be jack-shafted to allow mounting of piston pneumatic actuators and direct connect electronic actuators. Each end of the jack shaft shall receive at least one actuator to reduce jack shaft twist.
- C. Control Relays:
1. Control Pilot Relays:
 - a. Control pilot relays shall be of a modular plug-in design with retaining springs or clips.
 - b. Mounting bases shall be snap-mount.
 - c. DPDT, 3PDT, or 4PDT relays shall be provided, as appropriate for application.
 - d. Contacts shall be rated for 10 amps at 120VAC.
 - e. Relays shall have an integral indicator light and check button.

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D. Control Valves:

1. All automatic control valves shall be fully proportioning and provide near linear heat transfer control. The valves shall be quiet in operation and fail-safe open, closed, or in their last position. All valves shall operate in sequence with another valve when required by the sequence of operations. All control valves shall be sized by the control manufacturer, and shall be guaranteed to meet the heating and cooling loads, as specified. All control valves shall be suitable for the system flow conditions and close against the differential pressures involved. Body pressure rating and connection type (sweat, screwed, or flanged) shall conform to the pipe schedule elsewhere in this Specification.

E. Electronic Signal Isolation Transducers:

1. A signal isolation transducer shall be provided whenever an analog output signal from the Facility Management System is to be connected to an external control system as an input (such as a chiller control panel), or is to receive as an input signal from a remote system.
2. The signal isolation transducer shall provide ground plane isolation between systems.
3. Signals shall provide optical isolation between systems.

F. Electronic/Pneumatic Transducers:

1. Electronic to Pneumatic transducers shall provide:
 - a. Output: 3-15 PSIG.
 - b. Input: 4-20 mA or 0-10 VDC.
 - c. Manual output adjustment.
 - d. Pressure gauge.
 - e. External replaceable supply air filter.

G. Local Control Panels:

1. All control panels shall be factory constructed, incorporating the FMS manufacturer's standard designs and layouts. All control panels shall be UL inspected and listed as an assembly and carry a UL 508 label listing compliance. Control panels shall be fully enclosed, with sub-panel, hinged door, and key-locking latch.
2. In general, the control panels shall consist of the DDC controller(s), display module, and I/O devices—such as relays, transducers, and so forth—that are not required to be located external to the control panel due to function. The display module shall be flush mounted in the panel face unless otherwise noted.
3. All I/O connections on the DDC controller shall be extended to a numbered, color-coded, and labeled terminal strip for ease of maintenance and expansion. Wiring to I/O devices shall be made from

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- this terminal strip.
4. All other wiring in the panel, internal and external, shall be made to additional line or low voltage color-coded and labeled terminal strips. Low and line voltage wiring shall be segregated. All terminal strips and wiring shall be UL listed, 300-volt service and provide adequate clearance for field wiring.
 5. All wiring for every control panel shall follow a common color-coded format. All terminal strip color coding and numbering shall follow a common format. All wiring shall be neatly installed in plastic trays or tie-wrapped.
 6. A convenience 120 VAC duplex receptacle shall be provided in each enclosure, fused on/off power switch, and required transformers.

1.0 ROOM PRESSURIZATION CONTROLS

- 1.0.0 A room pressure control system (RPC) shall be furnished and installed to measure and display the measured room pressurization independent of supply and exhaust flow volumes. The system shall ensure that the air pressure of the space is negative with respect to the adjacent space to comply with USP 797, USP 800 and the recommendations put forth in the ANSI/ASHRAE Standard 170-2008 Ventilation of Health Care Facilities, the Facilities Guidelines Institute Guidelines for Design and Construction of Hospitals and Outpatient Facilities and the Guidelines for Environmental Infection Control in Health Care Facilities as well as the recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC).
- 1.0.1 The room pressure control system shall be completely independent for each individual room and shall not depend on measurements from other room control systems. Monitor and control functions shall be integrated into one unit.
- 1.0.2 The room pressure control system shall measure the pressure differential between the room and adjacent space. The room pressure sensor shall have a resolution of 5% of the measured value and shall detect any change in the room pressure within 0.1 second, with a minimum reading of 0.00001 inches H₂O.
- 1.0.3 The room pressure control system shall accept two pressure sensor inputs. The primary sensor shall measure the pressure differential between the room and anteroom. The secondary sensor shall measure the pressure differential between the anteroom and corridor.

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- 1.0.4 The room pressure control system shall control the room supply with a 0 to 10 VDC signal to maintain ventilation and room pressurization. The room pressure controller shall receive a voltage signal related to the supply air flow volume in order to maintain a minimum flow rate.
- 1.0.5 To ensure fast, accurate control, the room pressure control system shall have a PID control algorithm with two sets of tuning constants. The two sets of tuning constants enable fast response to large disturbances while maintaining stability at setpoint. The control sensitivity defining the breakpoint between input and steady state response shall be adjustable. The room pressure control system shall update the control output 10 times per second.
- 1.0.6 Each controller shall have a full color touch screen interface with a minimum touchscreen size of 4.3 inches. The controller shall be capable of displaying room mode, alarm status, user configurable room labels and all measurements for two rooms on a single screen without scrolling. Displays that change the backlighting color or external LEDs to indicate alarm status are not acceptable. Controllers that use keypads are not acceptable.
- 1.0.7 Local audible and visual alarms and relay contacts shall be enabled whenever either measured room pressure differential falls below its user configurable low alarm set point or rises above its user configurable high alarm set point, after a configurable delay. The primary and secondary pressure sensors shall have individual alarm set points for high and low alarms. A mute function shall temporarily silence the audible alarm for a user configured delay. Manual or automatic reset of the alarms shall be configurable.
- 1.0.8 The room pressure control system shall accept 7 inputs configurable as:
- Input 1: Room 1 Pressure Sensor
 - Input 2: Room 2 Pressure Sensor or Room 1 Temperature Setpoint
 - Input 3: Room 1 Supply Flow
 - Input 4: Room 1 Door switch or Occupancy Switch
 - Input 5: Room 1 Key switch or Relative Humidity Sensor
 - Input 6: Room 1 Temperature or Room 2 Door switch or Occupancy Switch
 - Input 7: Room 1 Exhaust Flow or Supply Air Temperature or Room 2 Key switch
- 1.0.9 The room pressure controller will use the flow station to calculate the Air Changes per Hour ventilation rate for the room. Local audible and visual

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alarms shall be enabled whenever the measured air volume falls below its configurable low alarm set point, after a configurable delay. Supply and exhaust flows shall have individual alarm set points. The audible alarm shall have a mute function to temporarily silence the alarm for a user-configured delay. Manual or automatic reset of the alarms shall be configurable.

- 1.0.10 The room pressure control system shall have Positive Mode, Negative Mode and No Isolation Mode for each room monitored or controlled. Users can change room mode either with an input from a key switch or through the touchscreen without accessing the full menu system. The key switch or touchscreen shall change the room mode from Positive Mode or Negative Mode to No Isolation Mode (and back), allowing the room to be used for standard patient care. In No Isolation Mode, the room pressure controller will disable all alarms.
- 1.0.11 Calibration of room pressure differential and air flow shall be done electronically through the use of the integral keypad. Calibration shall consist of adjusting the sensor zero point and sensor span to match a reference measurement. Password protection of the calibration items shall limit unauthorized access. Neither remote calibration nor calibrating through the use of potentiometers is acceptable.
- 1.0.12 The room pressure monitor shall have the ability to communicate with the Johnson Controls 'Metasys' building automation system (BAS) via Modbus, BACnet[®] MS/TP or LonWorks[®] communication protocols. Communication shall be native to the monitor device and not require an external interface or gateway.
- 1.0.13 The room pressure control system shall measure the room pressure differential. The system must accept up to 2 room pressure measurements. Systems that exclusively control the supply and exhaust flow volumes to maintain a volumetric offset are not acceptable.
- 1.0.14 The room pressure control system shall mount to a standard depth electrical box. The monitor shall not extend more than 0.625 inches from the wall.
- 1.0.15 The room pressure control system shall accept 2 flow measurements. The flow measurements shall be 0 to 10V signals. The flow measurements will be linear with respect to velocity pressure, linear with respect to velocity or venturi valve feedback.
- 1.0.16 The room pressure controller shall have a digital display of all configuration

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parameters. Configuration shall be done through the touchscreen display on the controller. Password protection shall limit unauthorized access to configuration parameters. An analog output of room pressure differential shall be user-configurable to either 0 to 10V or 4 to 20 mA. The room pressure controller shall have an RS-485 communications port, supporting the Modbus or BACnet MS/TP for seamless integration to the building automation system. Systems relying on an external gateway for communications are not acceptable.

- 1.0.17 The room pressure sensor shall be bi-directional with an accuracy of 10% of reading. The sensor shall be capable of being mounted in the room or the adjacent space. The room pressure sensor shall use two in line ceramic coated RTDs to measure the pressure differential. The room pressure sensor shall be temperature compensated over a range of 55°F to 95°F. Sensors employing a thermistor based sensor or that cannot differentiate between positive and negative pressures are not acceptable. Field calibration of the sensor shall be performed through the touchscreen on the room pressure controller. Systems utilizing pressure transducers to measure room pressure differential are not acceptable.
- 1.0.18 A factory authorized installing contractor shall install the room pressure sensor and controller in each room in strict accordance with the manufacturer's installation instructions. The installing contractor shall connect all devices, sensors, wiring, etc. as required.
- 1.0.19 The manufacturer or a factory authorized representative shall perform system start-up. Start-up shall include calibration of the controllers. Calibration shall be performed only after substantial completion of the building. Ceilings and doors shall be installed and the HVAC systems (exhaust and supply fans) shall be properly air-balanced. The balancing contractor shall be responsible for final verification and reporting of all air flows.
- 1.0.20 The manufacturer or a factory authorized representative shall provide 8 hours of training for building personnel. This shall be accomplished in two sessions.
- 1.0.21 The room pressure control system shall have a limited two-year warranty for all parts. The warranty shall commence on the date of "substantial completion" as set by the architect.
- 1.0.22 The RPC system shall be TSI Inc. Pressura model RPC30 Room Pressure Controller or prior approved equal.

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1.1 ROOM PRESSURE MONITOR

- 1.1.0 A room pressure monitor system (RPM) shall be furnished and installed to measure and display the measured room pressurization independent of supply and exhaust flow volumes. The system shall ensure that the air pressure of the space is positive or negative with respect to the adjacent space to comply with USP 797, USP 800 and the recommendations put forth in the ANSI/ASHRAE Standard 170-2008 Ventilation of Health Care Facilities, the Facilities Guidelines Institute Guidelines for Design and Construction of Hospitals and Outpatient Facilities and the Guidelines for Environmental Infection Monitor in Health-Care Facilities as well as the recommendations of CDC and the Healthcare Infection Monitor Practices Advisory Committee (HICPAC).
- 1.1.1 The room pressure monitor system shall be completely independent for each individual room. The room pressure monitor system shall not depend on measurements from other room monitor systems.
- 1.1.2 The room pressure monitor system shall measure the pressure differential between the room and adjacent space. The room pressure sensor shall have a resolution of 5% of the measured value and shall detect any change in the room pressure within 0.1 second, with a minimum reading of 0.00001 inches H₂O.
- 1.1.3 The room pressure monitor system shall accept one pressure sensor input. The primary sensor shall measure the pressure differential between the room and the adjacent space.
- 1.1.4 Each monitor shall have a full color touch screen interface with a minimum touchscreen size of 4.3 inches. Screen shall be capable of displaying multiple colors at one time. The monitor shall be capable of displaying room mode, alarm status, user-configurable room label and all measurements connected on a single screen without scrolling. Displays that change the backlighting color or external LEDs to indicate alarm status are not acceptable. Monitors that use keypads are not acceptable.
- 1.1.5 Local audible and visual alarms and relay contacts shall be enabled whenever either measured room pressure differential falls below its user configurable low alarm set point or rises above its user configurable high alarm set point, after a configurable delay. The pressure sensor shall have

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individual alarm set points for high and low alarms. A mute function shall temporarily silence the audible alarm for a user configured delay. Manual or automatic reset of the alarms shall be configurable.

- 1.1.6 The room pressure monitor system shall accept 7 inputs configurable as:
- Input 1: Room 1 Pressure Sensor
 - Input 2: Not Used
 - Input 3: Supply Flow
 - Input 4: Door switch or Occupancy Switch
 - Input 5: Key switch
 - Input 6: Door switch or Occupancy Switch
 - Input 7: Exhaust Flow
- 1.1.7 The room pressure monitor will use the flow station to calculate the Air Changes per Hour ventilation rate for the room. Local audible and visual alarms shall be enabled whenever the measured air volume falls below its configurable low alarm set point, after a configurable delay. Supply and exhaust flows shall have individual alarm set points. The audible alarm shall have a mute function to temporarily silence the alarm for a user-configured delay. Manual or automatic reset of the alarms shall be configurable.
- 1.1.8 The room pressure monitor system shall have Positive Mode, Negative Mode and No Isolation Mode. Users can change room mode either with an input from a key switch or through the touchscreen without accessing the full menu system. The key switch or touchscreen shall change the room mode from Positive Mode or Negative Mode to No Isolation Mode (and back), allowing the room to be used for standard patient care. In No Isolation Mode, the room pressure monitor will disable all alarms.
- 1.1.9 Calibration of room pressure differential and air flow shall be done electronically through the use of the integral keypad. Calibration shall consist of adjusting the sensor zero point and sensor span to match a reference measurement. Password protection of the calibration items shall limit unauthorized access. Neither remote calibration nor calibrating through the use of potentiometers is acceptable.
- 1.1.10 The room pressure monitor shall have the ability to communicate with the Johnson Controls 'Metasys' building automation system (BMS) via Modbus, BACnet[®] MS/TP communication protocols. Communication shall be native to the monitor device and not require an external interface or gateway.

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- 1.1.11 The room pressure monitor system shall measure the room pressure differential. The system must accept up to 3 room pressure measurements. Systems that exclusively monitor the supply and exhaust flow volumes to maintain a volumetric offset are not acceptable.
- 1.1.12 The room pressure monitor system shall mount to a standard depth electrical box. The monitor shall not extend more than 0.625 inches from the wall.
- 1.1.13 The room pressure monitor system shall accept 2 flow measurements. The flow measurements shall be 0 to 10V signals. The flow measurements will be linear with respect to velocity pressure, linear with respect to velocity or venturi valve feedback.
- 1.1.14 The room pressure monitor shall have a digital display of all configuration parameters. Configuration shall be done through the touchscreen display on the monitor. Password protection shall limit unauthorized access to configuration parameters. An analog output of room pressure differential shall be user configurable to either 0 to 10V or 4 to 20 mA. The room pressure monitor shall have an RS-485 communications port, supporting the Modbus or BACnet MS/TP for seamless integration to the building automation system. Systems relying on an external gateway for communications are not acceptable.
- 1.1.15 The room pressure sensor shall be bi-directional with an accuracy of 10% of reading. The sensor shall be capable of being mounted in the corridor (reference space) or the patient room (monitor led space). The room pressure sensor shall use two in-line ceramic coated RTDs to measure the pressure differential. The room pressure sensor shall be temperature compensated over a range of 55°F to 95°F. Sensors employing a thermistor based sensor or that cannot differentiate between positive and negative pressures are not acceptable. Field calibration of the sensor shall be performed through the touchscreen on the room pressure monitor.
- 1.1.16 A factory authorized installing contractor shall install the room pressure sensor and monitor in each room in strict accordance with the manufacturer's installation instructions. The installing contractor shall connect all devices, sensors, wiring, etc. as required.
- 1.1.17 The manufacturer or a factory-authorized representative shall perform system start-up. Start-up shall include calibration of the controllers. Calibration shall be performed only after substantial completion of the building. Ceilings and doors shall be installed and the HVAC systems (exhaust and supply fans) shall be properly air-balanced. The balancing

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contractor shall be responsible for final verification and reporting of all air flows.

- 1.1.18 The manufacturer or a factory-authorized representative shall provide 8 hours of training for building personnel. This shall be accomplished in two sessions.
- 1.1.19 The room pressure control system shall have a limited two-year warranty for all parts. The warranty shall commence on the date of “substantial completion” as set by the architect.
- 1.1.20 The RPC system shall be TSI Inc. PRESSURA™ Model RPM10 Room Pressure Monitor or prior approved equal.

1.2 CONSTANT VOLUME VENTURI AIR VALVE

- 1.2.0 Air valves shall be round, venturi shaped, constant volume valves with a spring-controlled cone. The valves are completely self-contained. The required air volume is maintained independent of duct system pressure variations at a given shaft position and over a specified differential static pressure operating range (0.3 to 3.0 in H₂O, 0.6 to 3.0 in H₂O or 0.6 to 6.0 in H₂O). The stainless steel control rod shall be modulated by an electric actuator in variable air volume applications or shall be fixed to a calibration dial in constant volume applications. The cone adjusts automatically to pressure variations before or after the valve to provide accurate air volume minimizing actuator motion given flow rate. The valves shall be shipped factory calibrated with dial positions corresponding to specific volume flow rates displayed in a table fixed to the valve. The valve shall be oriented according to its label.
- 1.2.1 Venturi valves will have an integral feedback module outputting a 1-10 VDC flow rate signal linear with respect to flow volume. The feedback module shall have a pressure switch to measure the pressure drop across the valve. If valve pressure drop is too low, the feedback module will output a 0.5VDC signal to indicate low airflow.
- 1.2.2 The valve housing will be constructed of aluminum and will incorporate a complete venturi containing an aluminum aerodynamic moving cone. The cone rod, the connecting links and the spring will be made of stainless steel. The cone shaft bearing surfaces will be made of Teflon. Inlet and outlet connections will be circular and of similar dimensions. In order to prevent dust accumulation and bacterial development, interior acoustic insulation will not be permitted.

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- 1.2.3 The air volume (CFM) shall be regulated using venturi valves. The controlled air volume shall be mechanically independent of static pressure variation at all actuator positions. Following a pressure variation, CFM correction shall be achieved through the spring loaded cone within one second. The pressure variation corrective action (new cone position) shall be independent of the actuator. External air speed sensors are not acceptable. The air volume shall be proportional to the valve cone position. All venturi valves shall be factory calibrated with a mechanical dial to permit direct reading of air volume. Future modifications shall not require special calibrating tools. The valve actuator shall be supplied and installed at the factory.
- 1.2.4 The airflow controllers shall be certified as required after installation and significant completion of the space being controlled.
- 1.2.5 A factory authorized installing contractor shall coordinate with the mechanical contractor to have the venturi valves installed in the exhaust ducts where indicated on the drawings in strict accordance with the manufacturer's installation instructions.
- 1.2.6 The manufacturer or a factory authorized representative shall perform initial start-up assuring that air valves are installed properly and are operational. Start-up shall include calibration of the controllers. Calibration shall be performed only after substantial completion of the building. Ceilings and doors shall be installed and the HVAC systems (exhaust and supply fans) shall be properly air balanced.
- 1.2.7 The venturi valve shall have a limited two-year warranty for all parts. The warranty shall commence on the date of "substantial completion" as set by the architect.
- 1.2.8 The Venturi air valves shall be TSI Inc. Model CVV or prior approved equal.

PART 3 – PERFORMANCE / EXECUTION

3.1 INSTALLATION PRACTICES

A. HVAC Control System Wiring:

1. All conduit, wiring, accessories and wiring connections required for the installation of the Facility Management System, as herein specified, shall be provided by the TCSI unless specifically shown on the Electrical

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Drawings. All wiring shall comply with the requirements of applicable portions of the electrical Division and national electric codes, unless otherwise specified in this section.

2. All system input wiring shall be twisted shielded pair, minimum 18 gauge wire. All system analog output wiring shall be twisted shielded pair/3-wire as required, minimum 18 gauge wire. Preconfigured cables between Terminal Unit Controllers and Thermostats are acceptable, minimum 24 gauge.
3. All internal panel device wiring for binary outputs and pilot relay shall be minimum 16 gauge wire.
4. All Class 2 wiring (24vac or less) wiring shall be installed in conduit unless otherwise specified.
 - a. Class 2 wiring above concealed accessible locations shall be supported every 5' from the building structure utilizing j-hooks designed for this application.
5. Low voltage control wiring and 24VAC can be run in the same conduit.
6. All wiring in mechanical rooms and exposed locations shall be in conduit. Rough-ins for wall mounted thermostats shall have a back-box installed with conduit turned out above the ceiling. Minimum control wiring conduit size 3/4".
7. DDC System Multi-conductor Instrumentation and Communication Cabling:
 - a. Analog Input, Analog Output, Binary Input, Binary Output, 24 VAC and General Purpose Cabling
 - 1) Cable shall consist of copper conductors not less No. 18 AWG-stranded.
 - 2) Shall be 2 or 3 conductor twisted cable with a drain wire
 - 3) Cable shall have a 100% overall shield.
 - 4) Cable shall be a plenum-rated.
 - 5) Cable shall meet or exceed NEC voltage rating of 300V.
 - 6) Cable shall be NEC type CMP.
 - 7) Cable shall meet or exceed UL temperature rating of +60 degrees C.
 - 8) Cable shall be labeled at a minimum of every 18" with the DDC System manufacturer's name and the type of signal carried within the cable, i.e. Analog Input, Analog Output, Binary Input, Binary Output, 24 VAC.
 - 9) Each of the cable types specified in Item A shall be of a different color coding for easy identification and troubleshooting. Required color coding:
 - a)Analog Input Cable: Yellow
 - b)Analog Output Cable: Tan
 - c)Binary Input Cable: Orange

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- d) Binary Output Cable: Violet
- e) 24 VAC Cable: Gray
- f) General Purpose Cable: Natural
- b. Primary and Secondary Communications Network Cabling
 - 1) Cable shall be of type recommend by the DDC System Manufacturer.
 - 2) Cable shall be shielded.
 - 3) Cable shall be a plenum-rated.
 - 4) Cable shall meet or exceed NEC voltage rating of 150V.
 - 5) Cable shall meet or exceed UL temperature rating of +60 degrees C.
 - 6) Cable shall be labeled at a minimum of every 18” with the DDC System manufacturer’s name, system name and the communications network name.
 - 7) Each of the cable types shall be of a different color coding for easy identification and trouble shooting and shall be of a different color than the cable specified in Item A above.
- c. Room Sensor Cabling
 - 1) Cable shall consist of copper conductors not less No. 24 AWG.
 - 2) Shall be multi-paired (at least two pairs) twisted cable.
 - 3) Cable shall have a 100% overall shield.
 - 4) Cable shall be a plenum-rated.
 - 5) Cable shall meet or exceed NEC voltage rating of 300V.
 - 6) Cable shall be NEC type Article 800-CMP.
 - 7) Cable shall meet or exceed UL temperature rating of +75 degrees C.
 - 8) Cable shall be labeled at a minimum of every 18” with the DDC System manufacturer’s name and labeled as a stat cable.
- B. Identification and Naming Standards:
 1. Controller Identification. All controllers shall be identified according to standard name conventions. This contractor shall schedule a meeting prior to installation of controls to coordinate with Facility Services dept the equipment and tag names required to match this project. The naming scheme is to match with the equipment inventory system.
 2. Point Naming. All controllers shall be identified according to standard name conventions. This contractor shall schedule a meeting prior to installation of controls to coordinate with Facility Services Dept the point naming standards to match existing.
 3. Panel Identification. All local control panels shall be identified by a

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- plastic engraved nameplate securely fastened to the outside of the controller enclosure.
4. Raceway Identification. All the covers to junction and pull boxes of the control system raceways shall be painted blue or have identification labels stating "Control System Wiring" affixed to the covers. Labels shall be typed, not hand written.
 5. Wire Identification. All low and line voltage control wiring shall be identified by a number, as referenced to the associated control diagram, at each end of the conductor or cable. Identification number shall be permanently secured to the conductor or cable and shall be typed. All control wiring shall be identified by appropriate label (analog input, analog output, binary input, binary output,) every five feet.
- C. Digital Controller Systems:
1. Each system will be provided with its own dedicated direct digital controller or application specific controller. Mechanical systems such as AHUs, VAVs or Packaged system shall not be controlled from more than 1 application specific controller.
 2. Systems that use second tier controllers as point expansion for system controllers shall only be allowed under when the I/O points are directly controlled by the CPU of the local application specific controller.
- D. Input Devices:
1. All Input devices shall be installed per the manufacturer's recommendation. All in-line devices such as duct smoke detectors, air flow stations, etc. are to be mounted (to the appropriate mechanical systems) by the installer of the mechanical duct system, as applicable.
- E. Output Devices:
1. All output devices shall be installed per the manufacturer's recommendation. The mechanical contractor shall install all in-line devices such as control valves, dampers, etc.
 2. Actuators: All control actuators shall be sized capable of closing against the maximum system shut-off pressure. The actuator shall modulate in a smooth fashion through the entire stroke. When any pneumatic actuator is sequenced with another device, pilot positioners shall be installed to allow for proper sequencing.
 3. Control Dampers: Shall be opposed blade for modulating control of air flows. Parallel blade dampers shall be installed for two position applications.
 4. Control Valves: Shall be sized for proper flow control with equal percentage valve plugs. The maximum pressure drop for water applications shall be 5 PSI. The maximum pressure drop for steam

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applications shall be 7 PSI.

5. Electronic Signal Isolation Transducers: Whenever an analog output signal from the Facility Management System is to be connected to an external control system as an input (such as a chiller control panel), or is to receive as an input a signal from a remote system, provide a signal isolation transducer. Signal isolation transducer shall provide ground plane isolation between systems. Signals shall provide optical isolation between systems

3.2 COMMISSIONING

- A. Commissioning the Facility Management System is a mandatory documented performance requirement of the selected TCSI for all control systems detailed in this Specification and sequence of operations. Commissioning shall include verification of proper installation practices by the TCSI and subordinate installers, point verification and calibration, system/sequence of operation verification with respect to specified operation, and network/workstation verification. Documentation shall be presented upon completion of each commissioning step and final completion to ensure proper operation of the Facility Management System. See APPENDIX A within this Specification section for sample naming convention.
- B. Acceptance Check List: An acceptance checklist shall be completed that documents compliance with each item of this Specification.
- C. Testing Procedure: Upon completion of the installation, the TCSI shall start-up the system and perform all necessary testing and run diagnostic tests to ensure proper operation. The TCSI shall be responsible for generating all software and entering all database information necessary to perform the sequences of control herein specified.
- D. Testing Documentation: Prior to acceptance testing, TCSI shall create, on an individual system basis, trend logs of input and output points, or have an automatic Point History feature for documentation purposes.
- E. Field Points Testing:
 1. This step shall verify that all of the installed points receive or transmit the correct information prior to loading/activating the system software.
 2. ON/OFF commands from the workstation shall be performed in order to verify each binary output point.
 3. All binary input points are to be tested using the HAND/OFF/AUTOMATIC selector switch on the associated motor control center or by manually jumpering across the field device contacts.
 4. All analog output points providing pneumatic output control shall be

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tested using a command from the workstation to modulate the output from minimum calibrated signal to maximum calibrated signal. Analog Output values to Pneumatic transducers shall be displayed so that a 0 percent display value corresponds to the pressure required to set the pneumatic actuator to minimum position, and a 100 percent display value corresponds to the pressure required to set the pneumatic actuator to the maximum position.

5. All analog output points shall be tested using a command from the workstation to modulate the output device from minimum calibrated signal to maximum calibrated output.
6. All analog input points are to be tested by comparing the reading obtained through the workstations or portable terminal to the value of an independent testing meter.

F. Noncompliant Items:

1. The Installer shall remove and replace, at its expense, all items that are not in compliance with the Specification requirements.

3.3 SYSTEM FMS SPECIFIC REQUIREMENTS

A. FMS Remote Access:

1. The Facility Management System provided shall include the capability for multiple users to access the FMS simultaneously from remote locations. Interface shall be to the entire FMS and provide the capability to monitor all I/O and adjust parameters.

3.4 ALARM MANAGEMENT

A. Alarm management shall be provided to monitor, buffer, and direct alarm reports to operator devices and memory files. Each DDC panel shall perform distributed, independent alarm analysis and filtering to minimize operator interruptions due to non-critical alarms, to minimize network traffic, and to prevent alarms from being lost. At no time shall the DDC panel's ability to report alarms be affected by either operator activity at a PC Workstation or local I/O device, or communications with other panels on the network.

B. Point Change Report Description:

1. All alarm or point change reports shall include the point's English language description, and the time and date of occurrence.

C. Prioritization:

1. The installer shall set up all system analog points with high and low alarm limits. All digital system points shall be associated with a status

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- feedback point and all exceptions shall be reported as alarms. The user shall be able to define the specific system reaction for each point. Alarms shall be prioritized and filtered to minimize nuisance reporting and to speed operator response to critical alarms.
2. The user shall also be able to define under which conditions point changes need to be acknowledged by an operator, and/or sent to follow-up files for retrieval and analysis at a later date.
- D. Critical and Non-Critical Alarm Routing:
1. Critical alarms shall be defined as chiller, boiler, generator, critical space temperature or humidity, and kilowatt demand approaching threshold. Critical alarms shall be displayed at the workstation, printed at the alarm printer, and alpha paged to the on-duty maintenance person over the owners alphanumeric paging system. Alpha pages shall provide sufficient information to identify the equipment and the point in alarm and the time and date of occurrence.
 2. All other alarms shall be considered non-critical and shall be displayed and acknowledged before being sent to the alarm log.
- E. Report Routing:
1. Alarm reports, messages, and files will be directed to a user-defined list of operator devices, or PCS used for archiving alarm information. Alarms shall also be automatically directed to a default device in the event a primary device is found to be off-line.
- F. Alarm Messages:
1. In addition to the point's descriptor and the time and date, the user shall be able to print, display, or store a 65-character alarm message to more fully describe the alarm condition or direct operator response.
 2. Each standalone DDC panel shall be capable of storing a library of at least 250 Alarm Messages. Each message may be assignable to any number of points in the panel.
- G. Auto-Dial Alarm Management:
1. In Dial-up applications, only critical alarms shall initiate a call to a remote operator device. In all other cases, call activity shall be minimized by time-stamping and saving reports until an operator scheduled time, a manual request is made, or until the buffer space is full. The alarm buffer must store a minimum of 50 alarms.

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3.5 DYNAMIC ANIMATED COLOR GRAPHIC DISPLAYS

- A. TCSI shall update and utilize the existing floor-plan graphics licensed software to include the new equipment and control points required for this project.
- B. Color graphic floor plan displays, and system schematics for each piece of mechanical equipment (including air handling units, variable air volume boxes, fan coils, unit ventilators, cabinet heaters, exhaust fans, fin tube radiation, chilled water systems, hot water boiler systems, and so forth as required) shall be provided, as specified in the point list portion of this Specification, in order to optimize system performance analysis, speed alarm recognition, and simplify user interaction. The TCSI shall fully configure the color graphics and plot all associated control/monitoring points on the screen. Copies of all color graphics screens shall be provided as color printouts to the engineer for approval.
- C. System Selection/Penetration:
 - 1. The operator interface shall allow users to access the various system schematics and floor plans via a graphical penetration scheme, menu selection, or test-based commands. Floor plans shall display room numbers and each zone shall be color-coded. The operator shall be able to point and click on a room or zone of rooms (in the case of an air handler that serves more than one zone). The room or zone will display an animated flow diagram of the mechanical equipment that serves that zone, with all control and monitoring points associated with that piece of equipment, including setpoints. Setpoints shall be overridden or modified from this screen.
- D. Dynamic Animated Data Displays:
 - 1. Dynamic temperature values, humidity values, flow values, and status indication shall be shown in their actual respective locations, and shall automatically update to represent current conditions without operator intervention. Damper and valve positions, air and water flow shall be animated and shall represent actual, current conditions.
- E. System Performance Analysis Screens:
 - 1. System performance analysis screens shall be provided for the major mechanical systems (such as air handlers, chillers, boilers, and so forth.). For each of these systems, the screen shall be split into quadrants, simultaneously displaying the following data:
 - a. Quadrant 1. – Dynamic animated flow diagrams.
 - b. Quadrant 2. – All analog values associated with the mechanical system shall be graphed on an X-Y axis graph. Five-minute samples for the last twenty-four hour period shall plotted.

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Scaling shall be automatic.

- c. Quadrant 3. – Text sequence of operations from engineering as-built submittals.
- d. Quadrant 4. – Space temperature summaries from each zone being served by mechanical system.

F. Windowing:

- 1. The windowing environment of the PC Operator Workstation shall allow the user to simultaneously view several graphics at the same time to analyze total building operation, or to allow the display of a graphic associated with an alarm to be viewed without interrupting work in progress.

G. Alarm Annunciation:

- 1. Any point in a state of alarm shall change the color of its symbol to red until it is no longer in alarm.

3.6 WARRANTY RESPONSE/TRAINING

A. Response to all warranty request shall be made by the TCSI. TCSI shall warrant labor and material for one year from date of acceptance. TCSI shall verify proper operation of the DDC controls system and identify items requiring repair and/or replacement. TCSI shall repair and/or replace any and all FMS items.

B. Provide a four hour training sessions on the system

3.7 SYSTEM COMPLETION

A. Upon completion of installation, TCSI shall start up the system shall start up the system and perform all necessary testing and run diagnostics to ensure proper operation. An acceptance test shall with a owners representative and the engineer shall be performed at the completion of the project. The test shall consist of a point to point checkout to ensure proper operation of all systems components, sequence of operations, verify graphics and verify proper naming conventions per standards. Provide a checklist with each point verified by the control contractors prior to the acceptance test. When the system performance is deemed 100% complete by the engineer and owners rep, the system will be accepted.

PART 4 - SEQUENCE OF OPERATIONS

A. REFER TO THE DRAWINGS FOR SOO.

END OF SECTION 236950

HVAC MODIFICATIONS TO CENTRAL SUPPLY

AT

LALLIE KEMP REGIONAL MEDICAL CENTER

INDEPENDENCE, LOUISIANA

OCTOBER 10, 2020

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INDEX OF DRAWINGS:

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DATE	DESCRIPTION	REV. NO.

Job No: 19003

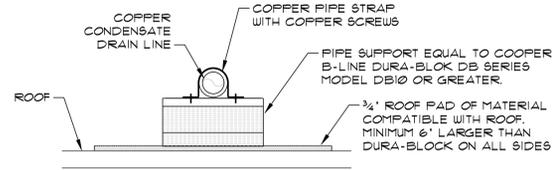
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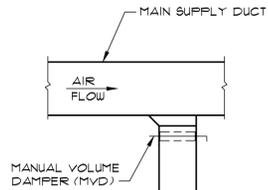
T1.1



NOTES:

1. PROVIDE SUPPORTS @ 6'-0" O.C. MAXIMUM SPACING.
2. PROVIDE SHIMS AT SUPPORTS AS REQUIRED TO ACHIEVE PROPER SLOPE IN PIPING.

CONDENSATE PIPE SUPPORT DETAIL
NOT TO SCALE



SUPPLY DUCT TAKE-OFF DETAIL
NOT TO SCALE

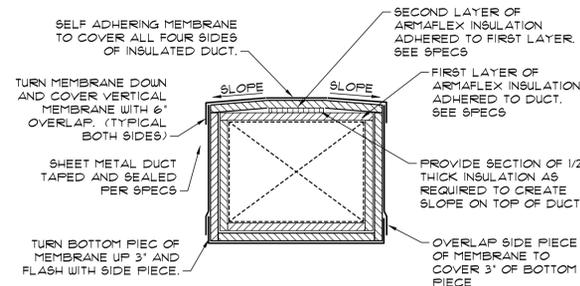
UNIT DESIGNATION	TOTAL CFM	MIN. O.A. CFM	EXT. STATIC PRESS., IN W.G.	COOLING CAPACITY				ELECTRICAL DATA				AAON MODEL NO.	UNIT WEIGHT	REMARKS			
				TOTAL BTUH	SENSIBLE BTUH	ENTERING	LEAVING	V	PH	EVAP. FAN HP	UNIT MCAV				HEATING COIL NO. OF STAGES		
						D.B./W.B./F	D.B./W.B./F										
RTU-1	2650	1100	10	132300	81740	83.3	70.4	54.0	53.9	480	3	2	24/30	DUCT HEATERS	RN-011	2500	1, 2, 3, 4, 5, 6, 7, 8

1. UNIT SHALL BE SIDE DISCHARGE ON SUPPLY & RETURN DUCT CONNECTIONS
2. UNIT SHALL HAVE A MINIMUM OF TWO REFRIGERANT CIRCUITS.
3. UNIT CONTROLS SHALL BE COMPATIBLE WITH EXISTING BUILDING AUTOMATION SYSTEM.
4. UNIT SHALL BE HIGH EFFICIENCY
5. PROVIDE LOW AMBIENT CONTROL TO 0°F
6. FURNISH MOTORIZED OUTSIDE AIR DAMPER
7. UNIT SHALL BE RATED FOR VARIABLE VOLUME OPERATION
8. FURNISH WITH HOT GAS BYPASS COIL AND DIGITAL SCROLL COMPRESSORS

EXHAUST FAN SCHEDULE

FAN DESIG.	TYPE	BALANCE CFM	SELECTION CFM	S.P. IN INCHES	RPM	MOTOR DATA			GREENHECK MODEL NO.	REMARKS
						HP	VOLTS	PH		
EF-1	WALL MOUNTED CENT	400	475	0.5	2070	1/2	120	1	CW-10HP-VG	1, 2, 3, 4, 5, 6
EF-2	WALL MOUNTED CENT	400	475	0.5	2070	1/2	120	1	CW-10HP-VG	1, 2, 3, 4, 5, 6

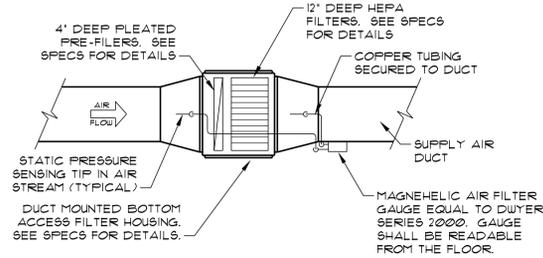
1. FAN SHALL BE SELECTED BASED ON SELECTION CFM AND STATIC PRESSURE LISTED.
- FAN SHALL BE BALANCED IN FIELD TO BALANCE CFM INDICATED.
2. INTERLOCK FAN TO RUN WHENEVER RTU-1 EVAPORATOR FAN IS RUNNING.
3. PROVIDE SOLID STATE SPEED SWITCH MOUNTED NEAR THE FAN FOR AIR BALANCE ONLY.
4. PROVIDE BACK DRAFT DAMPER, BIRD SCREEN AND DISCONNECT SWITCH.
5. FAN MOTOR SHALL BE VARIABLE SPEED MOTOR WITH 0-10 VDC INPUT SIGNAL
6. FURNISH CONSTANT VOLUME SPEED CONTROLLER WITH FAN TO CONTROL FAN SPEED TO ADJUST FOR HEPA FILTER LOADING



NOTES:

1. SEAMS OF SELF ADHERING MEMBRANE SHALL BE KEPT TO A MINIMUM, UNLESS DUCT SIZES DICTATES, THERE SHALL BE NO SEAMS ON THE TOP OF THE DUCTS EXCEPT FOR ACROSS THE WIDTH OF THE DUCT. WHERE HORIZONTAL SEAMS ARE REQUIRED ON THE SIDES THEY SHALL BE OVERLAPPED TO SHED WATER.
2. SEE DUCT SUPPORT DETAILS FOR SUPPORT REQUIREMENTS

EXTERIOR DUCT INSULATION DETAIL
NOT TO SCALE

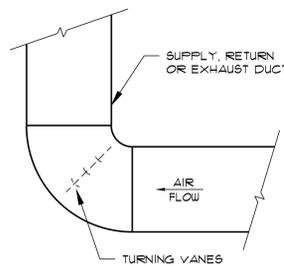


BOTTOM ACCESS FINAL FILTER HOUSING DETAIL
NOT TO SCALE

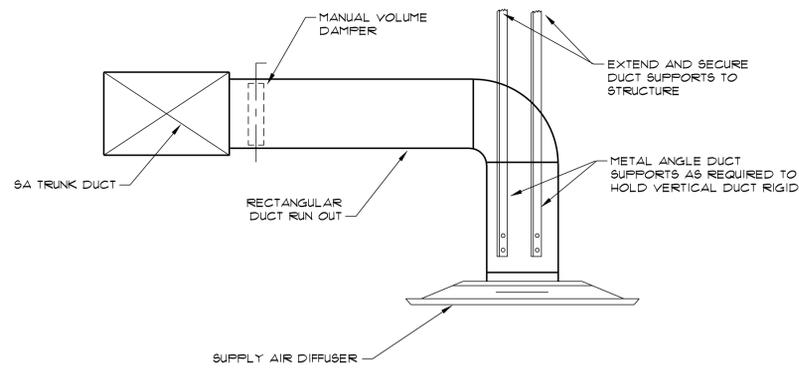
HEATER DESIG.	CFM	ELECTRIC DATA			MARKET MODEL NO.	REMARKS
		VOLT/PH	KW	NO. STEPS		
EDH-1	575	277/1	4	SCR	HF SERIES	1, 2, 3
EDH-2	400	277/1	4	SCR	HF SERIES	1, 2, 3
EDH-3	300	277/1	3	SCR	HF SERIES	1, 2, 3
EDH-4	200	277/1	3	SCR	HF SERIES	1, 2, 3
EDH-5	100	480/1	3	SCR	HF SERIES	1, 2, 3
EDH-6	475	277/1	4	2	HF SERIES	1, 2, 3

1. OPEN COIL ELEMENT WITH MAX PRESSURE DROP @15"
2. FURNISH AUTO RESET THERMAL CUTOFFS FOR OVER TEMPERATURE PROTECTION
3. UNIT SHALL BE SLIP IN CONFIGURATION WITH FACTORY WIRED INTEGRAL TERMINAL BOX

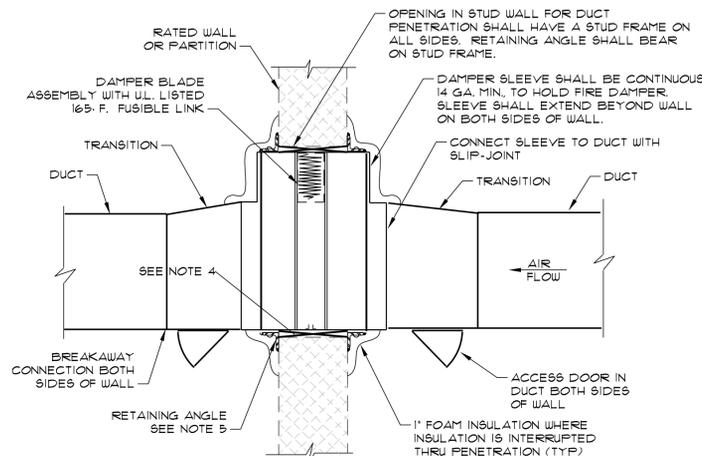
DUCT HEATER SCHEDULE



RADIUS SQUARE ELBOW DETAIL
NOT TO SCALE



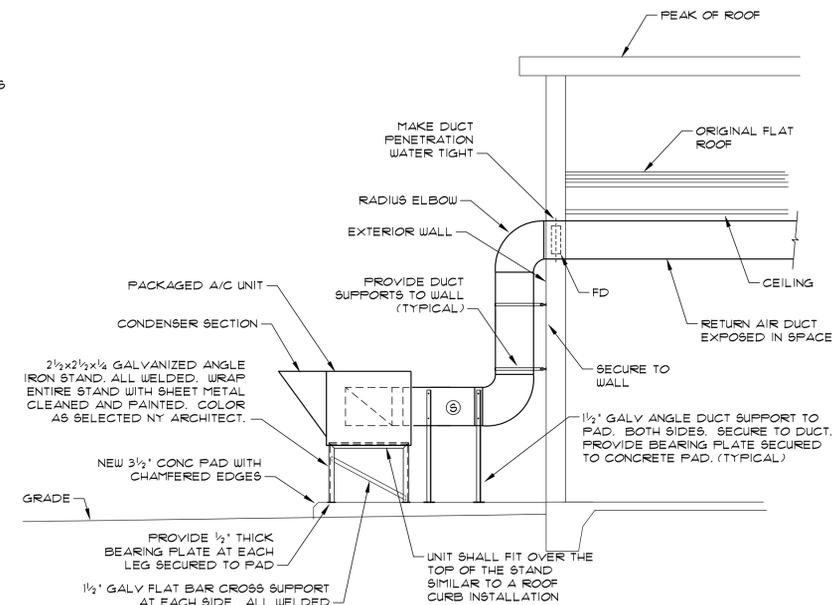
DIFFUSER INSTALLATION DETAIL
NOT TO SCALE



NOTES:

1. PROVIDE UL LISTED DAMPER AND SLEEVE IN ACCORDANCE WITH UL 555.
2. INSTALL DAMPER AND SLEEVE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. PROVIDE MIN. 14 GA. SLEEVE. EXTEND BEYOND WALL MAXIMUM 6 INCHES.
4. THAN 1/8" PER LINEAR FOOT BOTH DIRECTIONS.
5. PROVIDE MINIMUM 2"x2"x3/16" RETAINING ANGLE ON TOP, BOTTOM AND SIDES. ATTACH ANGLES TO SLEEVE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. DAMPER SHALL BE SELF SUPPORTING, INDEPENDENT OF DUCTWORK. ANGLES SHALL OVERLAP WALL MIN. OF ONE INCH.
6. DAMPER SHALL BE SIZED TO PROVIDE EQUIVALENT FREE AREA OF DUCT, SEE SCHEDULE OF SIZES REQUIRED OR INCREASE DAMPER SIZE CROSS SECTIONAL AREA BY 20% ABOVE CONNECTING DUCT SIZE.

FIRE DAMPER INSTALLATION DETAIL
NOT TO SCALE



NOTES:

- 1) INSTALL SMOKE DETECTOR IN SUPPLY AND RETURN AIR DUCT WIRED TO SHUT UNIT DOWN WHENEVER SMOKE IS DETECTED.
- 2) REFER TO SPECIFICATIONS FOR DESCRIPTION OF EXTERNAL INSULATION REQUIRED ON EXTERIOR DUCTWORK.
- 3) SUPPLY AIR DUCT INSTALLATION SIMILAR TO RETURN AIR DUCTWORK SHOWN

PACKAGED AIR UNIT INSTALLATION DETAIL
NOT TO SCALE



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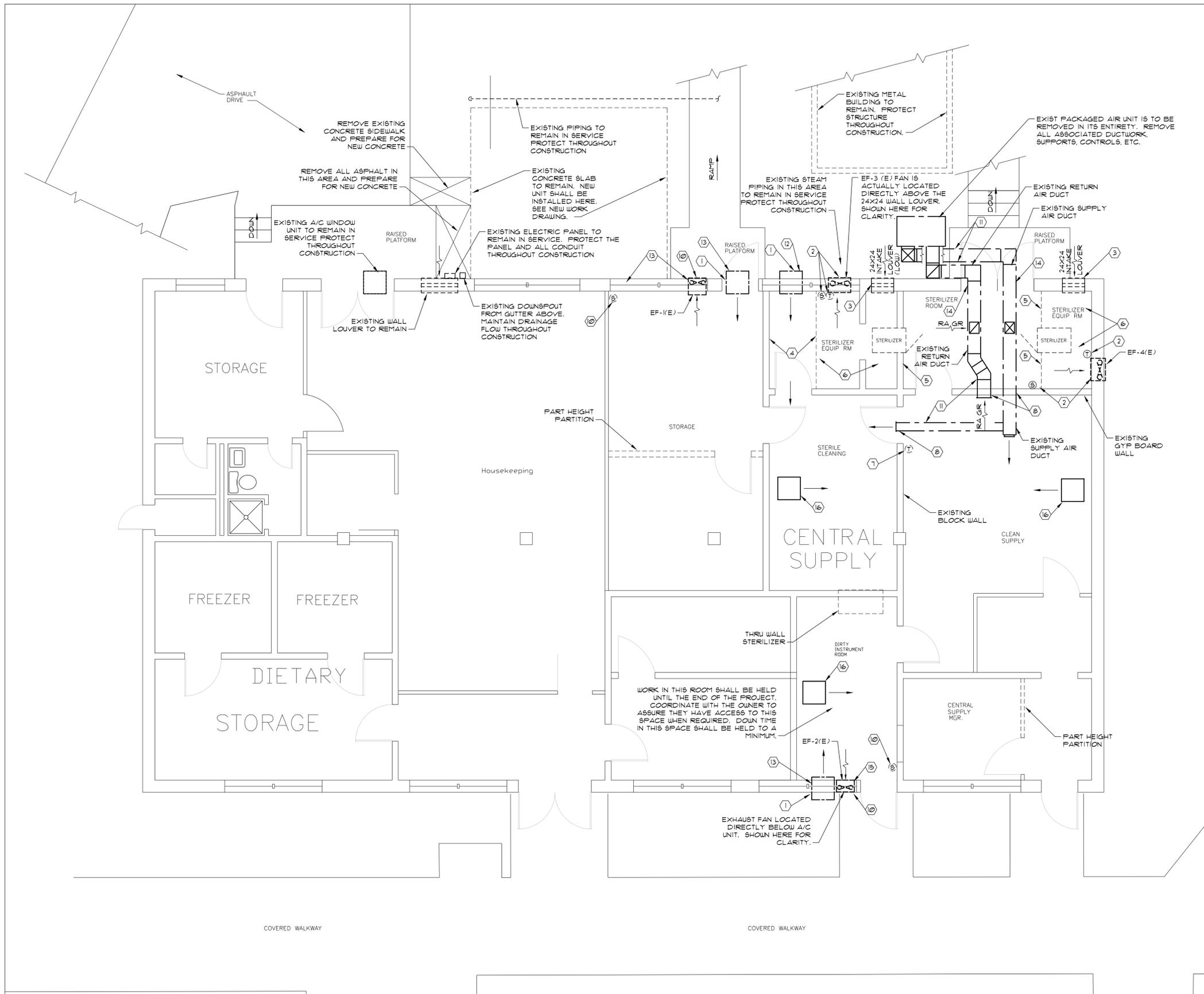
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M1.2



- SPECIFIC NOTES:**
- 1 EXISTING A/C UNIT TO BE REMOVED. REMOVE ALL EXISTING SUPPORTS, CONTROLS, ETC.
 - 2 EXISTING WALL EXHAUST FAN TO REMAIN. PREPARE EXISTING CONTROLS TO BE CONNECTED TO THE BUILDING AUTOMATION SYSTEM.
 - 3 EXISTING WALL INTAKE LOUVER TO REMAIN.
 - 4 EXISTING AIR CHASE CONNECTING THE A/C UNIT WITH STERILE CLEANING ROOM TO REMAIN. ALL SIDES OF THIS CHASE SHALL BE SEALED AIR TIGHT WITH RESPECT TO THE STERILIZER EQUIPMENT ROOM.
 - 5 ALL OPENINGS IN WALL BETWEEN STERILIZER ROOM AND STERILIZER EQUIPMENT ROOM SHALL BE SEALED AIR TIGHT.
 - 6 ALL WALLS IN STERILIZER EQUIPMENT ROOM SHALL BE MADE AIR TIGHT WITH RESPECT TO OTHER AREAS OF THE BUILDING.
 - 7 EXISTING THERMOSTAT TO BE REMOVED. REMOVE EXISTING CONTROL WIRING.
 - 8 ALL WALL AND CEILING OPENINGS LEFT AFTER DUCTWORK IS REMOVED SHALL BE SEALED AIR TIGHT. PATCH & PAINT NEW WORK TO MATCH EXISTING WALL.
 - 9 NOT USED
 - 10 EXISTING WALL EXHAUST FAN TO BE REMOVED. REMOVE ALL SUPPORTS, CONTROLS, ETC.
 - 11 EXISTING DUCT, SUPPORTS, ETC. TO BE REMOVED.
 - 12 REMOVE EXISTING A/C WINDOW UNIT AND ALL INFILL MATERIALS FROM EXISTING TRANSOM. PREPARE THE SPACE FOR NEW INFILL CONSTRUCTION. SEE DETAIL 1/M13 ON SHEET M1.3.
 - 13 REMOVE EXISTING A/C WINDOW UNIT AND ALL INFILL MATERIALS FROM EXISTING WINDOW. PREPARE THE SPACE FOR NEW INFILL CONSTRUCTION. SEE DETAIL 2/M13 ON SHEET M1.3.
 - 14 REMOVE EXISTING DUCTWORK AND ALL INFILL MATERIALS FROM EXISTING TRANSOM. PREPARE THE SPACE FOR NEW INFILL CONSTRUCTION. SEE DETAIL 1/M13 ON SHEET M1.3.
 - 15 REMOVE EXISTING EXHAUST FAN AND ALL INFILL MATERIALS FROM EXISTING WALL OPENING. PREPARE THE OPENING FOR NEW INFILL CONSTRUCTION. SEE DETAIL 5/M13 ON SHEET M1.3.
 - 16 PROVIDE FLOOR MOUNTED, STAND ALONE HEPA FILTER IN THIS ROOM THROUGHOUT CONSTRUCTION. MAINTAIN CLEAN FILTERS THROUGHOUT CONSTRUCTION.



FIRST FLOOR PLAN - EXISTING CONDITIONS

1/4" = 1'-0"



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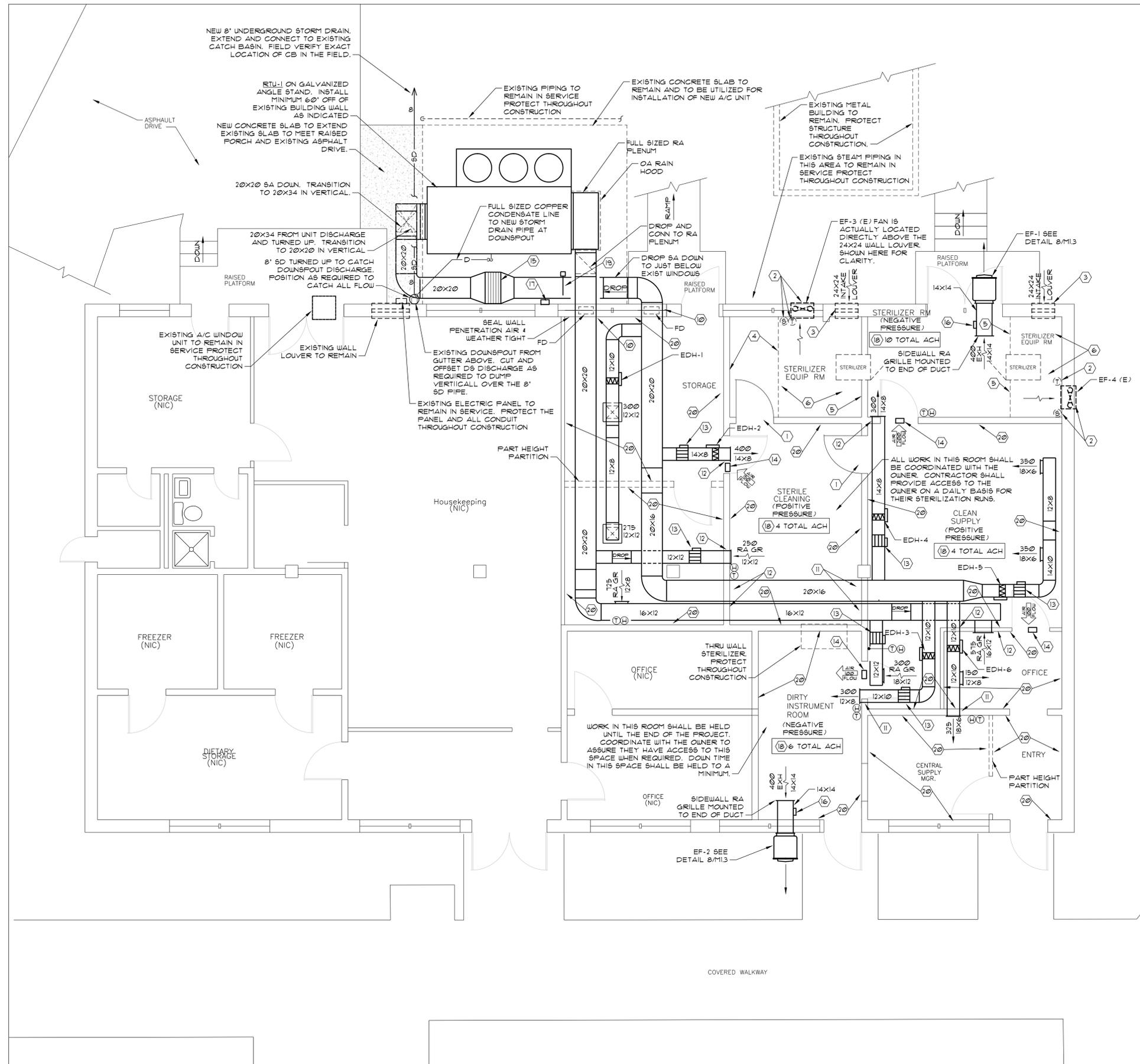


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SPECIFIC NOTES:

- 1 THIS DOOR SHALL BE CLOSED AT ALL TIMES. THE EXISTING DOOR SHALL BE MADE AIR TIGHT. THE SYSTEM SHALL CONSIST OF SMOOTH TOP DOOR SADDLE (THRESHOLD) #2164, NEW DOOR GASKET #2328 ON ALL SIDES AND TOP AND AUTOMATIC DOOR BOTTOM #2361 IN ORDER TO ELIMINATE ANY AIR TRANSFER BETWEEN THE TWO ADJACENT ROOMS. PROVIDE HYDRAULIC DOOR CLOSER.
- 2 EXISTING WALL EXHAUST FAN TO REMAIN. PREPARE EXISTING CONTROLS TO BE CONNECTED TO THE BUILDING AUTOMATION SYSTEM.
- 3 EXISTING WALL INTAKE LOUVER TO REMAIN.
- 4 EXISTING SPACE ABOVE CEILING CONNECTING THE EXISTING A/C WINDOW UNIT WITH STERILE CLEANING ROOM TO REMAIN. ALL SIDES OF THIS CHASE SHALL BE SEALED AIR TIGHT SPECIFICALLY WITH RESPECT TO THE STERILIZER EQUIPMENT ROOM. COVER THE EXTERIOR WALL WITH GYP BOARD SEALED AIR TIGHT. PAINT ALL WALLS, CEILING AND FLOOR IN THIS SPACE. COLOR TO MATCH EXISTING.
- 5 ALL OPENINGS IN WALL BETWEEN STERILIZER ROOM AND STERILIZER EQUIPMENT ROOM SHALL BE SEALED AIR TIGHT.
- 6 ALL WALLS IN STERILIZER EQUIPMENT ROOM SHALL BE MADE AIR TIGHT WITH RESPECT TO OTHER AREAS OF THE BUILDING.
- 7 EXISTING THERMOSTAT TO BE REMOVED. REMOVE EXISTING CONTROL WIRING.
- 8 PROVIDE NEW EXHAUST LOUVER AND PLENUM IN OPENING LEFT BY REMOVED DUCTWORK OR EXHAUST FAN. SEAL AIR TIGHT AND WEATHER TIGHT. SEE DETAIL 3/M13 ON SHEET M13 FOR INSTALLATION DETAILS.
- 9 PROVIDE SOLID STATE SPEED CONTROLLER MOUNTED ON OR NEAR FAN FOR AIR BALANCE ONLY.
- 10 NEW DUCT PENETRATION THRU EXISTING WINDOW. SEE DETAIL 4/M13 ON SHEET M13 FOR INSTALLATION DETAILS.
- 11 NEW DUCT PENETRATION THRU EXISTING BLOCK WALL. SEE DETAIL 6/M13 ON SHEET M13 FOR INSTALLATION DETAILS.
- 12 NEW DUCT PENETRATION THRU EXISTING GYP BOARD WALL. PATCH OPENING WITH FRAMING AND NEW GYP BOARD. FINISH AND PAINT TO MATCH EXISTING.
- 13 NEW CONSTANT VOLUME VENTURI AIR VALVE AND CONTROLLER WITH FLOW FEEDBACK. PART OF THE ROOM PRESSURIZATION CONTROL SYSTEM. REFER TO SPECIFICATIONS FOR DETAILS.
- 14 NEW ROOM PRESSURIZATION SENSOR AND CONTROLLER. PART OF THE ROOM PRESSURIZATION CONTROL SYSTEM. REFER TO SPECIFICATIONS FOR DETAILS. EQUAL TO TSI MODEL RFP110.
- 15 INSTALL NEW BOTTOM ACCESS. 24" WIDE X 48" HIGH X 12" DEEP (2-24"x24"x12" FILTERS) HEPA FILTER HOUSING. HOUSING SHALL BE WEATHER PROOF AND INSULATED SIMILAR TO EXTERIOR DUCTWORK. SEE DETAIL AND REFER TO SPECIFICATIONS FOR DETAILS.
- 16 DUCT MOUNTED CONSTANT VOLUME CONTROLLER TO CONTROL SPEED OF ASSOCIATED FAN IN ORDER TO MAINTAIN SPECIFIED AIR FLOW AND ROOM PRESSURIZATION. CONTROLLER SHALL BE EQUAL TO GREENHECK VARI-GREEN CONTROLLER AND SHALL BE FURNISHED BY THE FAN MANUFACTURER.
- 17 NEW VFD TO CONTROL RTU-1. VFD SHALL BE RATED FOR EXTERIOR INSTALLATION.
- 18 FINAL BALANCE SHALL PROVIDE FOR THE LISTED PRESSURIZATION AND TOTAL AIR CHANGES PER HOUR. MAKE ALL REQUIRED ADJUSTMENTS TO AIRFLOW TO ASSURE THE REQUIRED AIR CHANGES AND PRESSURIZATION OF THE ROOM IS ACCOMPLISHED.
- 19 DUCT MOUNTED AIRFLOW MEASURING DEVICE.
- 20 PAINT THIS WALL, DOOR AND TRIM WITH 2 COATS OF SHERWIN WILLIAMS -----

ROOM PRESSURIZATION SYSTEM NOTES:

1. SYSTEM SHALL BE A COMPLETE AND OPERATIONAL SYSTEM ENGINEERED AND PROVIDED BY A SINGLE SUPPLIER. IT SHALL MAINTAIN, MONITOR AND REPORT EITHER POSITIVE OR NEGATIVE PRESSURES IN STERILE CLEANING, CLEAN SUPPLY AND DIRTY INSTRUMENT ROOM AS INDICATED. PRESSURE DIFFERENTIAL SHALL BE MAINTAINED BETWEEN 0.01 - 0.03 IN. WATER COLUMN. ACCEPTABLE MANUFACTURER SHALL BE TSI, INC. OR PRIOR APPROVED EQUAL.
2. SYSTEM SHALL BE INSTALLED AND COMMISSIONED BY FACTORY AUTHORIZED TECHNICIANS.
3. EACH CONSTANT VOLUME VENTURI VALVE SHALL GET A 120 VOLT ELECTRICAL FEED TO THE TRANSFORMER. FROM THE TRANSFORMER 24 VOLT SHALL BE ROUTED TO THE ASSOCIATED MONITOR/CONTROLLER BY THE SYSTEM INSTALLER.
4. PROVIDE A DUCT MOUNTED CONSTANT VOLUME CONTROLLER PROGRAMMED TO CONTROL THE FAN SPEED OF THE ASSOCIATED EXHAUST FAN AND TO MAINTAIN A SET CFM AS THE HEPA FILTER UNIT LOADS UP AND INCREASES DUCT STATIC PRESSURE. CONTROLLER SHALL BE PROVIDED WITH THE EXHAUST FAN.
5. FURNISH AND INSTALL A ROOM PRESSURE SENSOR THROUGH THE WALL OF EACH CONTROLLED SPACE. LOCATE SENSOR ABOVE THE DOOR.

TEMPERATURE CONTROL AND ROOM PRESSURIZATION SYSTEM SEQUENCE OF OPERATION:

1. MAIN PACKAGED AIR UNIT RTU-1 SHALL BE BROUGHT ON THRU THE BUILDING AUTOMATION SYSTEM (BAS). THE UNIT SHALL HAVE A MOTORIZED OUTSIDE AIR DAMPER THAT SHALL OPEN WHEN THE UNIT IS ENERGIZED AND SHALL CLOSED WHEN THE UNIT IS OFF.
2. BAS TEMPERATURE AND HUMIDITY SENSORS SHALL MONITOR SPACE TEMP AND HUMIDITY AND REPORT TO THE BAS. WHENEVER ANY ZONE IS CALLING FOR COOLING THE UNIT SHALL DELIVER 55% (ADJUSTABLE) AIR. IF SPACE TEMP DROPS BELOW COOLING SET POINT, THE ELECTRIC HEAT STRIP SHALL BE BROUGHT ON IN STAGES TO MAINTAIN SPACE TEMPERATURE. IF SPACE HUMIDITY RISES ABOVE 50% (ADJUSTABLE) THE UNIT SHALL BE BROUGHT TO FULL COOLING AND THE HEAT STRIPS SHALL MODULATE TO MAINTAIN SPACE TEMPERATURE.
3. THE HVAC SYSTEM SHALL BASICALLY BE A CONSTANT VOLUME SYSTEM MAINTAINING SPECIFIED AIR FLOW UNDER NORMAL OPERATION. THE ROOM PRESSURIZATION SYSTEM (RPS) SHALL MODULATE THE AIR VALVES TO MAINTAIN SPECIFIED AIR FLOW AS CONDITIONS VARY INCLUDING LOADED HEPA FILTERS. UNIT FAN SPEED SHALL BE CONTROLLED BY THE AIR MEASURING STATION TO MAINTAIN THE PROPER CFM AS THE HEPA FILTER LOADS UP.
4. ALL AIR VALVES SHALL ACT AS CONSTANT VOLUME UNITS AND SHALL MAINTAIN SET AIR FLOW UNDER ALL CONDITIONS.
5. THE ROOM PRESSURIZATION SYSTEM SHALL MONITOR AND REPORT ROOM PRESSURE DIFFERENTIALS TO THE BUILDING AUTOMATION SYSTEM AND SHALL MODULATE MAINTAIN EITHER POSITIVE OR NEGATIVE ROOM PRESSURES AS INDICATED ON THE PLANS. SYSTEM SHALL BE CAPABLE OF PROVIDING HISTORY REPORTS INDICATING ROOM PRESSURES, TEMPERATURE AND HUMIDITY READINGS, ALARMS, ETC. ALL SHALL BE ACCESSIBLE THROUGH THE BAS.
6. THE ROOM PRESSURIZATION SYSTEM SHALL INCLUDE CONSTANT VOLUME VENTURI AIR VALVES AS INDICATED THAT SHALL MAINTAIN CONSTANT SUPPLY AND EXHAUST CFM AT ALL TIMES.

FIRST FLOOR PLAN - NEW WORK
1/4" = 1'-0"



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SPECIFICATION NOTES

GENERAL

1. THE CONTRACTOR SHALL VISIT THE JOB SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS PERTINENT TO THE WORK.
2. ALL EQUIPMENT AND MATERIALS PROVIDED SHALL BE IN STRICT CONFORMITY WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC). ANY CONFLICTS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
3. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS, INSPECTIONS, INSURANCE, BOND, LICENSES, AND COMPLY WITH ALL GOVERNING LAWS, ORDINANCES, RULES AND REGULATIONS INCLUDING THOSE OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) AND ALL MUNICIPAL, STATE OR OTHER AUTHORITY HAVING JURISDICTION OVER THE WORK.
4. UPON COMPLETION OF THE PROJECT, ALL SYSTEMS SHALL BE TESTED IN THE PRESENCE OF THE ENGINEER AND/OR OWNER.
5. THE CONTRACTOR SHALL GUARANTEE THE WORK INSTALLED BY HIM FOR ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE PROJECT, AND SHALL FURNISH FREE OF COST TO THE OWNER MATERIALS AND LABOR NECESSARY TO REPAIR OR REPLACE DEFECTIVE ITEMS OF WORKMANSHIP.
6. ELECTRICAL MATERIALS FURNISHED UNDER THESE SPECIFICATIONS SHALL BE BUILT AND TESTED IN ACCORDANCE WITH THE APPLICABLE STANDARDS OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA), THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI), THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), AND THE INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE).
7. ALL ELECTRICAL PRODUCTS ON THIS PROJECT SHALL BE NEW, LISTED BY UL, AND SHALL BEAR THE UL LABEL.
8. NO WORK SHALL BE CONCEALED UNTIL APPROVED BY THE LOCAL INSPECTOR AND ALL LOCAL REGULATIONS ARE ADHERED TO.
9. ALL WORKMANSHIP SHALL BE OF THE HIGHEST QUALITY, AND CONFORM TO GUIDELINES SET FORTH IN NECA MANUALS.
10. ONCE PER WEEK AND UPON COMPLETION OF THE PROJECT THE CONTRACTOR SHALL REMOVE ALL DEBRIS ACCUMULATED AS A RESULT OF WORK PERFORMED.
11. DO NOT CUT STRUCTURAL FRAMING, WALLS, FLOORS, AND OTHER MEMBERS WHICH ARE LOAD BEARING, EXCEPT WITH WRITTEN CONSENT OF THE ARCHITECT AND/OR GENERAL CONTRACTOR.
12. WHERE DAMAGE TO SURFACES AND/OR FINISHES OCCUR DUE TO CUTTING OR INSTALLATION OF ELECTRICAL WORK, THE CONTRACTOR SHALL PATCH SURFACES AND/OR FINISHES TO RESTORE THEM TO THEIR ORIGINAL CONDITION.
13. PROVIDE LAMINATED PLASTIC NAMEPLATES FOR PANELBOARDS, DISCONNECT SWITCHES, AND MOTOR CONTROLLERS. NAMEPLATES SHALL BE INSCRIBED TO IDENTIFY EQUIPMENT WITH DESCRIPTION SHOWN ON DRAWINGS. NAMEPLATES SHALL BE WHITE WITH BLACK ETCHED LETTERS, 1/4" MINIMUM SIZE LETTERING.
14. PROVIDE ALL MISCELLANEOUS MOUNTING HARDWARE INCLUDING ANGLES, BRACKETS, HANGERS, ETC NECESSARY FOR PROPER SUPPORT OF ELECTRICAL EQUIPMENT.
15. MAINTAIN PROPER WORKING CLEARANCE AROUND ELECTRICAL EQUIPMENT PER NEC ARTICLE 110.
16. TEMPORARY POWER POLE SHALL BE PROVIDED AND LOCATED IN AN AREA THAT WILL NOT INTERFERE WITH CONSTRUCTION ACTIVITIES. COORDINATE EXACT LOCATION WITH GENERAL CONTRACTOR.
17. ALL TEMPORARY POLE(S), LIGHTS, EQUIPMENT, ETC. SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.

DEMOLITION

1. DISCONNECT ELECTRICAL SYSTEMS NOTED FOR REMOVAL.
2. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY.
3. REMOVE EXPOSED ABANDONED CONDUIT. CUT ABANDONED CONDUIT FLUSH WITH EXISTING WALLS AND FLOORS TO REMAIN, AND PATCH SURFACES.
4. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION.
5. DO NOT REUSE EXISTING CONDUCTORS REMOVED FROM EXISTING CONDUIT RUNS.
6. CONTRACTOR TO VERIFY ALL CONDUIT, OUTLETS, LIGHT FIXTURES, ETC. THAT MAY NEED TO BE RELOCATED FOR THE INSTALLATION OF EQUIPMENT DUCTS, ETC. UNDER THIS CONTRACT. BID IS TO INCLUDE COSTS FOR THIS RELOCATION.
7. WHEN LIGHTS OR OUTLETS ARE REMOVED IN AN AREA, THE WORKING CONDITION OF ALL LIGHTS AND OUTLETS ELECTRICALLY DOWNSTREAM ARE TO BE VERIFIED. PROVIDE ADDITIONAL CIRCUITING AS REQUIRED TO INSURE OPERATION OF ELECTRICAL DEVICES.

RACEWAYS

1. MINIMUM CONDUIT SIZE SHALL BE 1/2 INCH.
2. CONDUIT RUN IN FINISHED AREAS SHALL BE RUN CONCEALED. CONDUIT RUN IN UNFINISHED AREAS SHALL BE RUN EXPOSED.
3. CONDUIT SHALL BE HELD SECURELY IN PLACE BY HANGERS AND FASTENERS OF APPROPRIATE DESIGN AND DIMENSIONS FOR THE PARTICULAR APPLICATION. SUPPORT CONDUIT IN ACCORDANCE WITH NEC.
4. RACEWAY INSTALLATION SHALL BE AS FOLLOWS:
 - A. RIGID GALVANIZED STEEL IN ALL EXTERIOR LOCATIONS
 - B. EMT IN ALL INTERIOR LOCATIONS
 - C. FLEXIBLE METAL CONDUIT FOR ALL FINAL CONNECTIONS TO LIGHT FIXTURES AND EQUIPMENT SUBJECT TO VIBRATION, SUCH AS MOTORS. FLEXIBLE CONDUIT RUNS SHALL NOT EXCEED 48 INCHES. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS.
 - D. SCHEDULE 40 PVC FOR ALL CONDUIT UNDER WALKWAY, BUILDING OR UNDERGROUND.
5. WHERE CONDUIT AND/OR CABLES PENETRATE FIRE-RESISTANT/RATED WALLS, PARTITIONS, CEILINGS, OR FLOORS, ADEQUATE FIRE SEALS USING UL LISTED METHODS AND PRODUCTS LISTED FOR THE APPLICATION TO MAINTAIN THE FIRE-RESISTANCE RATING SHALL BE PROVIDED AND INSTALLED.
6. CONDUIT PASSING THROUGH EXTERIOR WALLS SHALL BE MADE WATERTIGHT.
7. CONDUIT SHALL RUN PARALLEL AND PERPENDICULAR TO THE BUILDING STRUCTURE.
8. COORDINATE CONDUIT ROUTING WITH ARCHITECTURAL AND MECHANICAL SYSTEMS.

WIRE

1. ALL WIRING SHALL BE INSTALLED IN CONDUIT.
2. ALL CONDUCTORS SHALL BE COPPER, #12 AWG MINIMUM WITH 600 VOLT TYPE THHN-THWN, 75 DEGREE C INSULATION.
3. USE MANUFACTURER APPROVED PULLING COMPOUND OR LUBRICANT WHERE NECESSARY; COMPOUND SHALL NOT DETERIORATE CONDUCTOR OR INSULATION. DO NOT EXCEED MANUFACTURERS RECOMMENDED PULLING TENSIONS. USE PULLING MEANS THAT WILL NOT DAMAGE THE CABLES OR RACEWAY.
4. IDENTIFY AND COLOR-CODE THE CONDUCTORS AS FOLLOWS:

120/208V	277/480V
o PHASE A - BLACK	o PHASE A - BROWN
o PHASE B - RED	o PHASE B - ORANGE
o PHASE C - BLUE	o PHASE C - YELLOW
o NEUTRAL - WHITE	o NEUTRAL - GRAY
o GROUND - GREEN	o GROUND - GREEN
5. PROVIDE WIRENUT TYPE CONNECTORS FOR #10 AWG AND SMALLER WIRE SIZES. PROVIDE COMPRESSION TYPE CONNECTORS FOR LARGER WIRE SIZES.
6. SPLICES SHALL ONLY BE MADE IN ACCESSIBLE JUNCTION BOXES.
7. NOT MORE THAN THREE PHASE WIRES AND THREE NEUTRAL SHALL BE INSTALLED IN ANY HOME RUN, UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS. EACH PHASE WIRE IS TO HAVE ITS OWN NEUTRAL.
8. TEST CONDUCTORS IN ACCORDANCE WITH NETA REQUIREMENTS.

BOXES AND FITTINGS

1. INTERIOR OUTLET BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED FLAT ROLLED SHEET STEEL SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
2. EXTERIOR OUTLET BOXES SHALL BE CORROSION RESISTANT CAST METAL. EXTERIOR JUNCTIONS BOXES AND PULL BOXES SHALL BE NEMA 3R GALVANIZED STEEL OR FIBERGLASS.
3. PROVIDE MOUNTING ACCESSORIES AS REQUIRED.

DISCONNECT SWITCHES

1. DISCONNECT SWITCHES SHALL BE NEMA KS 1, HEAVY DUTY TYPE WITH EXTERNAL, LOCKABLE HANDLE, CLIPS TO ACCOMMODATE SPECIFIED FUSES AND INTERLOCKED WITH COVER IN CLOSED POSITION. DISCONNECT SWITCHES SHALL BE MANUFACTURED BY SQUARE D, GENERAL ELECTRIC, SIEMENS OR CUTLER-HAMMER.
2. FUSES SHALL BE CLASS RK5 TIME DELAY DUAL ELEMENT. FUSES LARGER THAN 600 AMP SHALL BE CLASS L, CURRENT LIMITING.
3. FUSES FOR MAIN SERVICE DISCONNECT SWITCH SHALL BE BUSSMAN KRP-C_SP OR EQUAL.
4. DISCONNECT SWITCHES LOCATED INDOOR SHALL BE NEMA 1, AND NEMA 3R FOR OUTDOOR LOCATIONS.

GROUNDING

1. GROUND ALL NON-CURRENT CARRYING METAL PARTS OF ELECTRIC RACEWAYS, ENCLOSURES, AND EQUIPMENT UTILIZING ELECTRICITY IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE ARTICLE 250.
2. PROVIDE EXOTHERMIC WELD, IN KIT FORM, FOR UNDERGROUND OR STRUCTURAL STEEL CONNECTIONS.
3. EACH FEEDER AND BRANCH CIRCUIT INSTALLED UNDER THIS PROJECT SHALL INCLUDE A GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE TABLE 250-122.

FIRE ALARM SYSTEM

1. FIRE ALARM SYSTEM IS NEW (CURRENTLY UNDER INSTALLATION).
2. ALL COMPONENTS ADDED ARE TO BE FULLY COMPATIBLE TO THE NEW FACP.
3. PROVIDE SURGE SUPPRESSION ON THE OUT-GOING LINES FROM THE FACP TO THE CLASSROOM BUILDING & ON ALL INCOMING LINES AT THE POWER BOOSTER. THESE ARE TO INCLUDE INITIATING, SIGNALING, POWER, & TELEPHONE LINES.
4. FIRE ALARM SYSTEM SHALL BE TESTED AND CERTIFIED AS REQUIRED BY THE STATE FIRE MARSHAL.

REVISIONS

DATE	DESCRIPTION

DRAWING TITLE :

SPECIFICATION NOTES

PROJECT NO : LK1623-19
 DRAWN BY : RSB CHECKED BY : RHN
 DATE : 10-08-20 SCALE : 1/4"=1'
 SHEET :

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