A PROJECT OF THE
PEORIA PARK DISTRICT
PEORIA, ILLINOIS

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION & WELLNESS CENTER

600 N.E. EAST WATER ST.
PEORIA, ILLINOIS 61603

PROJECT # 19-023
FEBRUARY 23, 2021

PROJECT MANUAL

PACKAGE #_____

PROJECT MANUAL INCLUDING SPECIFICATIONS FOR:

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION & WELLNESS CENTER
600 N.E. WATER ST.
PEORIA, ILLINOIS 61603

ARCHITECT:	APACE DESIGN ARCHITECTS & ENGINEERS ATTN: MARK CORDES 2112 E. WAR MEMORIAL DR. PEORIA, ILLINOIS 61614 TELEPHONE: (309) 685-4722
OWNER:	PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, PEORIA, ILLINOIS
TRUSTEES:	ROBERT L. JOHNSON, SR., PRESIDENT JACQUELINE J. PETTY JOSEPH CASSIDY JOYCE HARANT MATTHEW P. RYAN NANCY L. SNOWDEN MIC WILLIAMS
PROJECT MANAGER:	BECKY FREDRICKSON PLANNING, DESIGN & CONSTRUCTION DIVISION BRADLEY PARK EQUIPMENT SERVICE 1314 N. PARK ROAD PEORIA, ILLINOIS 61604 TELEPHONE: (309) 657-5274
ADMINISTRATIVE STAFF:	EMILY CAHILL, EXECUTIVE DIRECTOR BRENT WHEELER, DEPUTY DIRECTOR MATT FREEMAN, SUPERINTENDENT OF PARKS KARRIE ROSS, SUPERINTENDENT OF FINANCE AND ADMINISTRATIVE SERVICES BECKY FREDRICKSON, SUPERINTENDENT OF PLANNING, DESIGN AND CONSTRUCTION SHALESSE PIE, SUPERINTENDENT OF HUMAN RESOURCES

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Address all communications regarding this work to the project manager listed above.

ADVERTISEMENT FOR BIDS

Sealed bids will be received by the Peoria Park District, Peoria, Illinois, hereinafter known as the Owner, for the following project:

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION & WELLNESS CENTER
600 N.E. WATER ST.
PEORIA, IL 61603

It is the intent of the Owner to receive Base Bids for the project listed above.

Sealed bids will be received until 1:00 p.m., March 16, 2021, prevailing time, by the Owner, at the Peoria Park District Administrative Office, 1125 W. Lake Ave., Peoria, Illinois 61614. (The Board Room clock shall be the official time keeping device in respect to the bid submission deadline.)

An electronic file including Bid Documents is available at www.peoriaparks-planning.org at no charge. Bid Documents, including Plans, Specifications and Interpretations for this project may be obtained at the Planning, Design & Construction Department, Bradley Park Equipment Service, 1314 N. Park Road, Peoria, IL 61604. Telephone (309) 686-3386. A non-refundable plan deposit of $50.00 will be charged for each printed set of Bid Documents.

A list of planholders can be obtained upon request. This information will be available up to twenty-four (24) hours prior to the scheduled bid opening time. **After that deadline, no information pertaining to the project will be given.**

A 10% Bid Bond is required, and is to be included with the Bid Proposal. The successful Bidder will be required to furnish a 100% Performance Bond and a 100% Labor and Materials Payment Bond within ten (10) days of formal Award of Contract.

The general prevailing rate of wage for the Peoria area shall be paid for each craft or type of worker needed to execute this contract or perform this work as required by the State of Illinois Department of Labor. Additionally, it is required that provisions of the Illinois Preference Act, the Illinois Drug Free Workplace Act, and the Substance Abuse Prevention on Public Works Act must be adhered to. Bidders are also advised that contract documents for this project include the non-discrimination, equal opportunity and affirmative action provisions in the Human Rights Act and rules and regulations of the Department of Human Rights. The Peoria Park District is an AA/EEO organization and encourages participation by minority and female-owned firms.

The Peoria Park District reserves the right to reject any or all bids, waive technical deficiencies, informalities or irregularities or rebid any project.

PLEASURE DRIVEWAY AND PARK DISTRICT
OF PEORIA, ILLINOIS

BY: ROBERT L. JOHNSON, SR., President

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SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

1. INSTRUCTIONS TO BIDDERS

A. "Instructions to Bidders", AIA Document A701, 1997 Editions, published by the American Institute of Architects, including revisions adopted before date of this Project Manual, is hereby made part of these specifications with same force and effect as though set forth in full.

B. The following modifies, changes, deletes from or adds to the **Instructions to Bidders** (AIA Document A701, 1997 Edition). Where any Article of the Instructions to Bidders is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

C. Parenthesis ( ) indicates the appropriate section and Subparagraph of the Instructions to Bidders which each paragraph of the Supplementary Instructions to Bidders modifies or refers to.

2. PROJECT DESCRIPTION

A. The Project description generally is as follows:

1. BASE BID:

Removal of existing natatorium HVAC unit and specified ductwork. Provide and install new exterior support structure, new HVAC unit, ductwork, and associated components per drawings and specifications.

B. PRE-BID MEETING :

1. A pre-bid meeting will be held at the RiverPlex on Tuesday, March 2, 2021 at 9:00am.

3. CODES AND PERMITS

A. COSTS ASSOCIATED WITH REGULATORY COMPLIANCE. All Work performed in connection with this Project shall be in compliance with the requirements of all applicable local, state, and federal laws, regulations, and rules, as well as the requirements of the Construction Documents. The Bid Price shall reflect all costs of compliance to those requirements, whether or not specifically stated in the Construction Documents or specific sections of the Project Manual.

B. PERMITS/FEES. Work shall not commence until all required building (and/or other) permits have been secured by the Contractor and copies of these permits submitted to the Owner's Representative. Cost of permits is to be included in the Bid Price.

4. BID GUARANTY

The bid must be accompanied by a Bid Guaranty which shall not be less than 10% of the amount of the Bid. At the option of the Bidder, the 10% Guaranty may be a Certified Check, Cashier's Check, or a Bid Bond. The Bid Bond shall be secured by a Guaranty or a Surety Company acceptable to the Owner. No bid will be considered unless it is accompanied by the required Guaranty. Funds must be made payable to the order of the Owner. Cash deposits will not be accepted. The Bid Guaranty shall ensure the execution of the Agreement and the furnishing of the Surety Bond or Bonds by the successful Bidder, all as required by the Contract Documents.

5. AWARD OF CONTRACT/REJECTION OF BIDS:

The Contracts will be awarded on the basis of Paragraph 5.3 of the Instructions to Bidders and Paragraph 16 of the Supplementary Instructions to Bidders. The Bidders to whom the awards are made will be notified at the earliest possible date. The Owner, however, reserves the right to reject any and all Bids, to accept any combination of base bids and alternates and to waive any technical deficiencies, informalities, or irregularities in Bids received whenever such rejection or waiver is in its interest.

No bid shall be withdrawn for a period of sixty (60) days after the opening of bids without the consent of the Owner. The failure of the Bidder to submit a Bid Bond, Certified Check or Cashier's Check in the full amount to cover all proposals bid upon shall be sufficient cause for rejection of his bid. The award will be made contingent upon submittal and evaluation of Contractor's Qualification Statement, Bonds, Certificate of Insurance, Contractor Certification(s), including Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors, etc.

6. EXECUTION OF AGREEMENT:

Following the award and within ten (10) days after the prescribed forms are prepared and presented for signature by the Owner's Representative, the successful Bidder shall execute and return to the Owner's Representative the Agreement in the form included in the Contract Documents in such number of copies as the Owner may require. The Owner’s Representative will provide Notice to Proceed after all bonds and any other required documents have been received by the Park District.

7. PERFORMANCE BOND/LABOR AND MATERIAL PAYMENT BOND & INSURANCE

A. BONDS REQUIRED. Having satisfied all conditions of award as set forth elsewhere in these Documents, the successful Bidder shall, within ten (10) calendar days after award of contract, furnish Surety Bonds in penal sums, each not less than the amount of the Contract as awarded as security for the faithful performance of the Contract (Performance Bond), and for the payment (Labor and Materials Payment Bond) of all persons, firms or corporations to whom the Contractor may become legally indebted for labor, materials, tools, equipment or services employed or used by him in performing the work.

B. **FORM OF BONDS**. **Such bonds shall be in the same form as the samples included in the Project Manual** and shall bear the same date as or a date subsequent to that of the Agreement. The current Power of Attorney for the person who signs for any Surety Company shall be attached to such Bonds. Bonds shall be signed by a Guaranty or Surety Company acceptable to the Owner.

C. **COST OF PERFORMANCE BOND/LABOR AND MATERIAL PAYMENT BOND**. All costs for the Performance Bond/Labor and Material Payment Bond shall be included in the submitted Bid Price.

D. **INSURANCE.** Insurance requirements for this project are addressed both in the Supplementary General Conditions and in "Attachment A.6", in the "Exhibits" section of this Project Manual.

a) In respect to the property ("builders risk") insurance coverages referenced in the Supplementary General Conditions: the successful Bidder will be required to provide such coverages as the work of the Project will be accomplished by one general contractor.

E. **TIME FRAMES.** The successful Bidder shall, within ten (10) days after award of contract by the Board of Trustees, submit Proof of Insurance coverages/Bonds in the form and amounts required to the Owner's Representative. Should the Bidder be unable to provide the required Proof of Insurance(s)/Bonds within the specified ten day period the Owner reserves the right, at its sole discretion, to withdraw its award of contract from that Bidder.

8. DEFAULT

A. The failure of the successful Bidders to execute the Agreement, supply the required Bonds or proof of required insurance coverage(s) within (ten) 10 days after award of contract, or within such extended period as the Owner may grant based upon reasons determined sufficient by the Owner, may constitute a default. In such case, award of contract will be transferred to the second lowest bidder.

9. CONTRACTOR'S QUALIFICATION STATEMENT

A. Contractor's Qualification Statement (AIA Document 305) shall be submitted by low bidder for evaluation prior to award of contract if so requested by the Owner or his representatives.

10. LIST OF SUBCONTRACTORS/PRODUCT & EQUIPMENT SUBSTITUTIONS

A. Each Bidder shall submit a "MAJOR SUBCONTRACTORS LIST" proposed to be used in the execution of the Work. If there will be no subcontractors, the Bidder shall state "No Subcontractors" on this form. The completed form is due with the Bid Proposal.

1) Identify the trade name, address, telephone number, and category of work of each subcontractor.

2) Failure to submit the "Major Subcontractors List" with the Bid Proposal may result in the rejection of the Bid.

3) Delete Subparagraphs (6.3.1.1) and (6.3.1.2) from AIA A701.

B. The Bidder, by submission of a signed bid form, agrees to install all products and equipment by brand name or names specified in the Technical Specifications sections of this Project Manual. "Or equal" substitutions will be allowed only if approved in writing prior to the bid opening and listed in the "Substitutions" section of the Bid Form.

11. CONTRACT ADMINISTRATION FORMS/COSTS OF FORMS

A. **REQUIRED FORMS**. The following AIA forms will be used (AIA forms will be supplied by the Owner if requested, and charged to the Contractor at cost) in the administration of the project:

1) **AIA Document A310**: "Bid Bond", February 1970 edition

2) **AIA Document A305**: "Contractor's Qualification Statement", 1986 edition

3) **AIA Document G702**: "Application and Certificate of Payment", May 1992 edition

4) **AIA Document G703**: "Continuation Sheet", May 1992 edition

B. **OTHER FORMS**. Other contract administration forms (to be provided by the Owner unless otherwise noted) required for use in the Project are:

1) **Major Subcontractors List**

2) **Contractor's Affidavit**

3) **Performance Bond**

4) **Labor and Material Payment Bond**

5) **Lien Waiver Forms**

6) **Weekly Workforce Report**

7) **Certified Payroll Form**

Please Note: Illinois State Law has changed. As a Contractor on a public works project, Contractor must submit

certified payroll directly to the Illinois Department of Labor. See details at **https://www2.illinois.gov/idol/laws-rules/conmed/pages/prevailing-wage-portal.aspx**

The first time submitting certified payroll to this site requires additional set-up time and specialized forms that must be used.

After submitting certified payroll directly to the Illinois Department of Labor, Contractor will receive a PDF proof of submittal. A copy of this PDF proof of submittal is required with pay applications to Owner.

8) Insurance Forms: As required in Attachment A (at end of Project Manual) (will not be provided by Owner)

9) Agreement Between Owner and Contractor

Examples of these forms are included in the Project Manual.

12. CONSTRUCTION TIME AND LIQUIDATED DAMAGES CLAUSE:

PROJECT COMPLETION. The Agreement will include the following paragraph(s) or language substantially the same, regarding construction time and liquidated damages:

1) LIQUIDATED DAMAGES: Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not Substantially Complete within the time specified below, plus any extensions thereof allowed in accordance with Article 8 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time.

2) Accordingly, instead of requiring any such proof, Owner and Contractor agree that as Liquidated Damages for delay (but not as a penalty) Contractor shall pay Owner TWO HUNDRED AND FIFTY DOLLARS ($250.00) for each calendar day that expires after One hundred eighty-nine (189) calendar days from Notice of Award until Substantial Completion is attained. The work is tentatively scheduled to be awarded on March 25, 2021 and be at Substantial Completion by September 30, 2021. Actual on-site work not affecting the use of the pool area will be permitted to begin on July 1, 2021. Owner will drain pools on August 1, 2021. On-site work in the pool area will be permitted starting August 2, 2021.

3) After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work necessary to achieve Final Completion within seven (7) calendar days or any proper extension thereof granted by Owner, Contractor shall pay Owner TWO HUNDRED AND FIFTY DOLLARS ($ 250.00) dollars for each day that expires after the time specified.

4) Owner and Contractor agree that the per day liquidated damage amounts set forth in subparagraphs "2" and "3" of this section constitute a reasonable forecast of the financial losses, actual costs and increased expenses the Owner may incur as a result of delayed Substantial or Final Completion of the Project.

13. PROJECT MANUAL/PLANS & SITE VISITATION

A. A set of Bid Documents may be examined, at no charge, at the office of the Owner's Representative.

B. **PLAN DEPOSIT**. An electronic file including Bid Documents is available at www.peoriaparks-planning.org at no charge. A printed set of Bid Documents, including Plans, Specifications and Interpretations for this project may be obtained at the Planning, Design & Construction Department, Bradley Park Equipment Service, 1314 N. Park Road, Peoria, IL 61604. Telephone (309)686-3386. A non-refundable plan deposit of $50.00 will be charged for each printed set of Bid Documents.

C. **FAMILIARITY WITH BID DOCUMENTS & SITE VISITATION**. Bidders, by submission of their Bids, represent that they have visited the site to acquaint themselves with the local conditions in which the Work is to occur, and that they are familiar with all the requirements of the Project, as defined in the Project Manual and the Plan(s).

14. OTHER MODIFICATIONS TO AIA-701/OTHER CONDITIONS

A. Add the following sentence to **(4.1.7**): "Bidder shall submit two (2) completed copies of Bid Form and retain one (1) copy for his files."

B. Delete Section **(6.2)** - "Owner's Financial Capability"; and last sentence of Paragraph **(4.2.1.)**

C. In reference to (**7.2.1**), the Peoria Park District reserves the right of final approval of bonding companies.

D. Delete paragraph **(7.1.3).**

15. EQUAL EMPLOYMENT OPPORTUNITY/SEXUAL HARASSMENT

A. It is a goal of the Peoria Park District to encourage 12% participation of minorities and women on Peoria Park District construction projects through contracts and workforce. Good Faith Effort must be made to encourage the use of minority and women owned businesses as sub-contractors and suppliers on the project. Good Faith Effort is defined below:

Based on the trades and availability of contractors required to complete the project, a minimum of three minority/women owned firms must be contacted. The Park District's list of minority/women owned firms will be included in all bid documents.

The bidder shall negotiate in good faith with the potential minority/women owned firms by not imposing any conditions which are not similarly imposed on all other subcontractors and suppliers, or by denying benefits ordinarily conferred on subcontractors or suppliers for the type of work for which bids were solicited. Minority and women owned businesses must be notified at least 3 business days prior to bid opening to allow adequate time to review and provide bid.

On all bids over $100,000.00, the bidder must complete and include in the bid, the **Minority/Women Owned Contact Sheet** form. This form will include name of companies contacted, the time and date companies were contacted, the method by which the companies were contacted, the response by the companies contacted, the area of work the companies were contacted about, and bid amounts received from the companies along with other comments.

The low bidder shall provide to the Park District upon request, copies of all correspondence including without limitation, faxes, letters, text messages, and emails sent to minority/women owned firms.

If a bidder does not provide the required documentation for Good Faith Effort, the bidder may be considered non-responsive and not a responsible bidder on this project. Park District staff may disqualify the bidder and move to the next low bidder.

Failure to complete and submit the following forms (provided in the bid packet) with the Bid may result in rejection of the bid.

1) "**Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors**" Form

2) "**Workforce Profile**" Form

3) "**Minority/Women Owned Contact Sheet**" Form

B. Effective July 1, 1993, every party to a public contract and every party bidding on public contracts is required to have a written **"Sexual Harassment Policy".** A copy shall be submitted with the Bid. The Sexual Harassment Policy must contain:

1) A definition of sexual harassment under state law;

2) A description of sexual harassment utilizing examples;

3) A formalized complaint procedure;

4) A statement of victim's rights;

5) Directions on how to contact the Illinois Department of Human Rights **- Illinois companies**. Out-of-State companies must include directions on how to contact the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency.

6) A recitation that there cannot be any retaliation against employees who elect to file charges.

Recommendation: Your **"Sexual Harassment Policy"** should be drafted in language easy to understand and any revisions should be reviewed by legal counsel. A copy of your policy should be posted in a prominent and accessible location to assure all employees will be notified of the company's position.

In order to conduct business with the Peoria Park District, you must have a written "Sexual Harassment Policy" that conforms to the new Act.

FAILURE TO DO SO WILL DISQUALIFY YOU AS AN ELIGIBLE VENDOR.

16. BID SUBMISSION

A. **DATE, TIME & PLACE OF RECEIVING BIDS**. Bids will be received until the date and time listed in the "Advertisement for Bids", at which time they will be publicly opened, read aloud and recorded. The Bid Opening will be held at the place listed in the "Advertisement for Bids".

B. **REQUIRED ITEMS**. The following items must be included as part of the "BID":

1) Two (2) signed copies of the **BID FORM**. (Retain the third copy for your files.)

2) The **PEORIA PARK DISTRICT CERTIFICATE OF EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE FOR CONTRACTORS AND VENDORS** form.

3) The **WORKFORCE PROFILE** form.

4) The Bidder's **SEXUAL HARASSMENT POLICY.**

5) If the bid is over $100,000.00 , the **MINORITY/WOMEN OWNED CONTACT SHEET** form**.**

6) The **CERTIFICATION OF COMPLIANCE OF THE LISTED PROVISIONS AND LAWS** form.

7) The **LIST OF SUBCONTRACTORS**. (Submit form and state "No Subcontractors" on the form, if none will be used.)

8) The **BID GUARANTY.**

C. **BID SUBMISSION**. The "BID" shall be enclosed in envelopes (outer and inner), both of which shall be sealed and clearly labeled with the following information, in order to prevent premature opening of the bid:

- "PROPOSAL"
- NAME OF PROJECT
- NAME OF BIDDER
- DATE/TIME OF BID OPENING

END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

Bid From: _____

PROJECT NO. 19-023
BID FOR: NATATORIUM HVAC REPLACEMENT
LOCATION: RIVERPLEX RECREATION & WELLNESS CENTER

BID FORM

BID TO: PEORIA PARK DISTRICT

UNDERSIGNED:

1. Acknowledges receipt of:

   A. Project Manual and Drawings for:

   _____

   B. Addenda: No. _____ through No. _____

2. Has examined facility and the bid documents and shall be responsible for performing work specifically required of him by all parts of bidding documents including specifications for entire project, even though such work may be included as related requirements specified in other divisions or sections.

3. And agrees to enter into and execute Contract with Owner, if awarded on basis of this bid, and to:

   A. Furnish Bonds and Insurance required by the Bidding & Contract Documents.

   B. Accomplish work in accord with Contract.

   C. Complete work within specified Contract time.

4. **CONTRACT TIME**: Contractor agrees to Substantially Complete ALL WORK as required by the Contract Documents per the Supplementary General Conditions and Supplementary Instructions to Bidders.

5. **BASE BIDS**:
   A. Base Bid:
   Bidder agrees to perform all building and site work, as set forth in the Project Manual and Drawings for the sum of:

   _____ Dollars ($_____.____)

6. **PROPOSED SUBSTITUTION LIST:**
   Base Bid(s) and Alternates are understood to include only those product brands, items, and elements which are specified in the Bid Documents. The following is a list of substitute products, equipment or methods of construction which the Bidder proposes to furnish on this project, with difference in price being added or deducted from Base Bid(s).

Bidder understands that acceptance of any proposed substitution which has not been approved as an "equal" to the product brand, item, or element specified prior to bid opening is at Owner's option. Approval or rejection of any substitutions listed below will be indicated before executing Contract.

ITEM	ADD	DEDUCT
_____	$_____	$_____
_____	$_____	$_____
_____	$_____	$_____

7. **BIDDERS CHECKLIST:**

Did you visit the site?	Yes	No
Is Bid Security enclosed? (If applicable)	Yes	No
Is Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors enclosed?	Yes	No
Is Workforce Profile enclosed?	Yes	No
Is Bidder's Sexual Harassment Policy enclosed?	Yes	No
If the bid is over $100,000.00, the Minority/Women Owned Contact Sheet enclosed?	Yes	No
Is List of Subcontractors enclosed?	Yes	No
Is Certification of Compliance of the Listed Provisions and Laws form enclosed?	Yes	No

8. **BIDDER INFORMATION**:

NAME OF BIDDER:_____

ADDRESS: _____

CITY, STATE, ZIP: _____

TELEPHONE NO.: _____

BY: _____

Bid From: _____

PROJECT NO. 19-023
BID FOR: NATATORIUM HVAC REPLACEMENT
LOCATION: RIVERPLEX RECREATION & WELLNESS CENTER

(Signature of Authorized Official)

TITLE: _____

BIDDER'S SEAL

WITNESS: _____

END OF BID FORM

Peoria Park District

Certificate of Equal Employment Opportunity Compliance
for
Contractors and Vendors

Disclosure of the information requested in this form is required by the Peoria Park District. Failure to properly complete and sign this form will result in it being returned unprocessed thereby resulting in a delay or denial of eligibility to bid.

As part of the Company's commitment to equal employment opportunity practices, this company does the following:

- Recruits, trains, upgrades, promotes and disciplines persons without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- Notifies all recruitment sources that all qualified applicants will be considered for employment without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- When advertising is used, specifies that all qualified applicants will be considered for employment without regard to race, color, sex, religion, national origin, veteran status, age, mental or physical ability.
- Notifies all labor organizations which furnish this company with any skilled or non-skilled labor of the Company's responsibility to comply with the equal employment opportunity requirements required in all contracts by the Peoria Park District.
- Notifies all of its sub-contractors of their obligation to comply with the equal employment opportunity requirements required in all contracts by the Peoria Park District.
- Has an affirmative action program that assures the company's fair employment practices are understood and carried out by all of its managerial, administrative and supervisory personnel.

Is the Company a minority/woman owned business (MBE/WBE)? ___NO ___ YES, if yes ___MBE or ___WBE?

The Company does not discriminate against any employees or applicants for employment because of race, color, religion, sex, national origin, veteran status, age, mental or physical ability.

The Company does not maintain segregated facilities for any of its employees on the basis of race, religion, color, national origin, because of habit, local custom, or otherwise.

The Company has a written sexual harassment policy meeting the Illinois Department of Human Rights requirements.

By signing this form, the Company attests that it complies with all statements listed above as part of the Company's commitment to equal employment opportunity practices. The Company further agrees that it has completed the attached Workforce Profile Sheet truthfully, to the best of its knowledge.

_____	_____
Company Name	Company Address
_____	_____
Signature of Company Official	Name / Title
_____	_____
Telephone Number & Fax Number	Email Address

WORKFORCE PROFILE

Job Classifications	Black Employees		White Employees		Hispanic Employees		Native American Employees		Asian Employees		Other Employees		TOTAL EMPLOYEES	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1. Officials, Managers, Supervisors														
2. Professionals														
3. Technicians														
4. Sales														
5. Office/Clerical														
6. White Collar Trainees:														
7. Skilled Crafts:														
8. Apprentices:														
9. On-the-job Trainees:														
10. Semi-skilled														
11. Service Workers														
12. Unskilled														
TOTALS														

Company Name: _____

WORKFORCE PROFILE INSTRUCTIONS

RACE/ETHNIC IDENTIFICATION

WHITE (not of Hispanic origin): All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.

BLACK (not of Hispanic origin): All persons having origins in any of the Black racial groups of Africa.

HISPANIC: All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

ASIAN or PACIFIC ISLANDER: All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands. This area includes, for example, China, India, Japan, Korea, the Philippine Islands, and Samoa.

NATIVE AMERICAN or ALASKAN NATIVE: All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.

DESCRIPTION OF JOB CLASSIFICATIONS

OFFICIALS, MANAGERS, AND SUPERVISORS - Occupations requiring administrative personnel who set broad policies, and exercise over-all responsibility for the execution of these policies, and direct individual departments or special phases of a firm's operations. Includes: officials, executives, middle management, plant managers, department managers/superintendents, salaried foremen who are members of management, purchasing agents and buyers, and kindred workers.

PROFESSIONALS - Occupations requiring either college graduation or experience of such kind and amount as to provide a comparable background. Includes: accountants/auditors, airplane pilots and navigators, architects, artists, chemists, designers, dietitians, editors, engineers, lawyers, librarians, mathematicians, natural scientists, personnel and labor relations workers, physical scientists, physicians, social scientists, teachers, and kindred workers.

TECHNICIANS - Occupations requiring combination of basic scientific knowledge and manual skill which can be obtained through about 2 years of post high school education, such as is offered in many technical institutes and junior colleges, or through equivalent on-the-job training. Includes: drafters, engineering aids, junior engineers, scientific assistants, surveyors, technical illustrators, technicians (medical, dental, electronic physical sciences), and kindred workers.

SALES WORKERS - Occupations engaging wholly or primarily in direct selling. Includes: advertising agents/salespersons, insurance agents/brokers, real estate agents/brokers, stock and bond salespersons, demonstrators, salespersons and sales clerks, and kindred workers.

OFFICE AND CLERICAL WORKERS - Includes all clerical type work regardless of level of difficulty, where the activities are predominantly non-manual though some manual work not directly involved with altering or transporting the products is included. Includes: bookkeepers, cashiers, collectors (bills and accounts), messengers and office couriers, office machine operators, shipping and receiving clerks, stenographers, typist and secretaries, telegraph and telephone operators, and kindred workers.

WHITE COLLAR TRAINEES - Persons engaged in formal training for official, managerial, professional, technical, sales, office and clerical occupations.

SKILLED CRAFTS - Manual worker of relatively high skill level having a thorough and comprehensive knowledge of the processes involved in their work. Exercise considerable independent judgment and usually receive an extensive period of training. Includes: the building trades hourly paid foremen and leadmen who are not members of management, mechanics and repairmen, skilled machining occupations, compositors and typesetters, electricians, engravers, job setters (metal), motion picture projectionists, pattern and model makers, stationary engineers, tailors and tailoresses, and kindred workers.

APPRENTICES - Persons employed in a program including work training and related instruction to learn a trade or craft which is traditionally considered an apprenticeship, regardless of whether the program is registered with a Federal or State agency.

ON-THE-JOB TRAINEES - Persons engaged in formal training for craftsmen when not trained under apprentice programs; semi-skilled, unskilled and service occupations.

SEMI-SKILLED WORKERS - Workers who operate machine or processing equipment or perform other factory-type duties of intermediate skill level which can be mastered in a few weeks and require only limited training.

SERVICE WORKERS - Workers in both protective and non-protective service occupations. Includes: attendants (hospital and other institution, professional and personal service), barbers, charwomen and cleaners, cooks (except household), counter and fountain workers, elevator operators, fire fighters, guards, watchmen and doorkeepers, stewards, janitors, police officers and detectives, porters, waiters and waitresses, and kindred workers.

UNSKILLED WORKERS - Workers in manual occupations which generally require no special training. Perform elementary duties that may be learned in a few days and require the application of little or no independent judgement. Includes: garage laborers, car washers and greasers, gardeners (except farm) and groundskeepers, longshoremen and stevedores, lumbermen, craftsmen and wood choppers, laborers performing lifting, digging, mixing loading and pulling operations, and kindred workers.

Minority/Women Owned Contact Sheet

Proof of Contact Efforts by General Contractor of MBE/WBE firms for the project

MBE/WBE Company Name	Minority Owned or Woman Owned?	Individual Contacted at MBE/WBE also date/time	Method of Contact & Information: Phone #, Fax #, Email	Response: (Provided Bid or No Bid?)	Area of Work	Comments: If Bid accepted, give $ amount. If Bid not accepted, give justification.

Company Name _____

P L E A S E B E A D V I S E D !

Every party to a public contract and every party bidding on public contracts are required to have a written sexual harassment policy that contains:

(1) a definition of sexual harassment under state law:

(2) a description of sexual harassment utilizing examples;

(3) a formalized complaint procedure;

(4) a statement of victims rights;

(5) directions on how to contact the Illinois Department of Human Rights – **Illinois companies. Out-of-State** companies must include directions on how to contact the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency.

(6) a recitation that there cannot be any retaliation against employees who elect to file charges.

Recommendation: Your sexual harassment policy should be drafted in language easy to understand and any revisions should be reviewed by legal counsel. A copy of your policy should be posted in a prominent and accessible location to assure all employees will be notified of the company's position.

In order to conduct business with the PEORIA PARK DISTRICT, you must have a written sexual harassment policy that conforms to the new ACT.

FAILURE TO DO SO
WILL DISQUALIFY YOU AS AN ELIGIBLE VENDOR!!!

Please be advised, effective July 1, 1993, Governor Jim Edgar established under Executive Order Number 7 (Public Act 87-1257) that every party to a public contract and every party bidding on a public contract within the State of Illinois must have a written policy statement prohibiting sexual harassment. The following model policy statement is a draft copy provided for use in formulating your company's policy statement

SEXUAL HARASSMENT POLICY STATEMENT

It is the responsibility of each individual employee to refrain from sexual harassment and it is the right of each individual employee to work in an environment free from sexual harassment.

DEFINITION OF SEXUAL HARASSMENT
According to the Illinois Human Rights Act, sexual harassment is defined as:

Any unwelcome sexual advances or requests for sexual favors or any conduct of a sexual nature when

1. submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment;
2. submission to or rejection of such conduct by an individual is used as the basis for employment decision(s) affecting such individual; or
3. such conduct has the purpose or effect of substantially interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.

The courts have determined that sexual harassment is a form of discrimination under Title VII of the U.S. Civil Rights act of 1964, as amended in 1991. One such example is a case where a qualified individual is denied employment opportunities and benefits that are, instead, awarded to an individual who submits (voluntarily or under coercion) to sexual advances or sexual favors. Another example is where an individual may submit to unwelcome sexual conduct in order to receive an employment opportunity.

Other conduct commonly considered to be sexual harassment includes:

⇒ Verbal: Sexual innuendoes, suggestive comments, insults, humor and jokes about sex, anatomy or gender-specific traits, sexual propositions, threats, repeated requests for dates, or statement about other employees, even outside of their presence, of a sexual nature.

⇒ Non-Verbal: Suggestive or insulting sounds (whistling), leering, obscene gestures, sexually suggestive bodily gestures, "catcalls", "smacking" or "kissing" noises.

⇒ Visual: Posters, signs, pin-ups, slogans of a sexual nature.

⇒ Physical: Touching, unwelcome hugging or kissing, pinching, brushing the body, coerced sexual intercourse or actual assault.

Sexual harassment most frequently involves a man harassing a woman. However, it can also involve a woman harassing a man or harassment between members of the same gender.

The most severe and overt forms of sexual harassment are easier to determine; however, some sexual harassment is more subtle and depends to some extent on individual perception and interpretation. The trend in the courts is to assess sexual harassment by a standard of what would offend a "reasonable woman" or a "reasonable man", depending upon the gender of the alleged victim.

An example of the most subtle form of sexual harassment is the use of endearments. The use of terms such as "honey", "darling", and "sweetheart" is objectionable to many women who believe that these terms undermine their authority and their ability to deal with men on an equal and professional level.

Another example is the use of a compliment that could potentially be interpreted as sexual in nature. Below are three statements that might be made about the appearance of a woman in the workplace:

- ⇒ "That's an attractive dress you have on."
- ⇒ "That's an attractive dress. It really looks good on you."
- ⇒ "That's an attractive dress. You really fill it out well."

The first statement appears to be simply a compliment. The last is most likely to be perceived as sexual harassment depending on individual perceptions and values. To avoid the possibility of offending an employee, it is best to follow a course of conduct above reproach, or to err on the side of caution.

RESPONSIBILITY OF INDIVIDUAL EMPLOYEES
Each individual employee has the responsibility to refrain from sexual harassment in the workplace. An individual employee who harasses a fellow worker is, of course, liable for his or her individual conduct. The harassing employee will be subject to disciplinary action up to and including discharge in accordance with company/organization policy or a collective bargaining agreement, as appropriate.

RESPONSIBILITY OF SUPERVISORY PERSONNEL
Each supervisor is responsible for maintaining a workplace free of sexual harassment. This is accomplished by promoting a professional environment and by dealing with sexual harassment as with all other forms of employee misconduct.

The courts have found companies/organizations as well as supervisors can be held liable for damages related to sexual harassment by a manager, supervisor, employee, or third party (an individual who is not an employee but does business with a company/organization, such as a contractor, customer, sales representative, or repair person).

Liability is based either on a company's/organization's responsibility to maintain a certain level of order and discipline, or on the supervisor acting as an agent of the company/organization. As such, supervisors must act quickly and responsibly, not only to minimize their own liability, but also that of the company/organization.

RESOLUTION OUTSIDE THE COMPANY/ORGANIZATION
It is hoped that most sexual harassment complaints and incidents can be resolved within a company/organization. However, an employee has the right to contact the Illinois Department of Human Rights (IDHR) or the U.S. Equal Employment Opportunity Commission (EEOC) about filing a formal complaint. An IDHR complaint must be filed within 180 days of the alleged incident(s) unless it is a continuing offense. A complaint with EEOC must be filed within 300 days.

Illinois Department of Human Rights
(217) 785-5100 – Springfield
(217) 785-5125 – TDD Springfield
(312) 814-6200 – Chicago
(312) 263-1579 – TDD Chicago

Illinois Human Rights Commission
(217) 785-4350 – Springfield
(217) 785-5125 – TDD Springfield
(312) 814-6269 – Chicago
(312) 814-4760 – TDD Chicago

U.S. Equal Employment Opportunity Commission
(312) 353-2613 – Chicago District Office
(800) 669-4000 – Toll Free Within State of Illinois
(800) 669-6820 – TDD Chicago

An employee who is suddenly transferred to a lower paying job or passed for promotion, after filing a complaint with IDHR or EEOC, may file a retaliation charge, also due 180 days (IDHR) or 300 days (EEOC) from the alleged retaliation.

An employee who has been physically harassed or threatened while on the job may also have grounds for criminal charges of assault and battery.

FALSE AND FRIVOLOUS COMPLAINTS
False and frivolous charges refer to cases where the accuser is using a sexual complaint to accomplish some end other than stopping sexual harassment. It does not refer to charges made in good faith which cannot be proven. Given the seriousness of the consequences for the accused, a false and frivolous charge is a severe offense that can itself result in disciplinary action.

CERTIFICATION OF COMPLIANCE

OF THE LISTED PROVISIONS AND LAWS

1) **Illinois Drug Free Workplace Act of 1991**

2) **The Substance Abuse Prevention on Public Works Act Public Act 95-0635:**
Prohibits the use of drugs and alcohol while performing work on a public works project.

The Contractor/Subcontractor has signed collective bargaining agreement for all of its employees that deal with the subject matter or the Contractor/Subcontractor has a prevention program that meets or exceeds the requirements of the Public Act for all employees not covered by a collective bargaining agreement.

3) **Safety Compliance:**
Contractor/Subcontractors will comply with any and all prevailing occupational safety and health standards. Such compliance may include a training component or require a written program of compliance.

4) **Illinois Criminal Code, Illinois Compiled Statutes 720 ILCS 5/33E-3 and 5/33E-4:**
Contractor/Subcontractor has not been barred from bidding on public contract as a result of bid rigging or bid rotating.

The undersigned representative of the Contractor/Vendor hereby certifies to comply with the laws and provisions listed above.

_____
Contractor/Subcontractor

_____
Name of Authorized Representative (type or print)

_____
Signature of Authorized Representative

_____
Date

MAJOR SUBCONTRACTORS LIST

The following tabulation of Major Subcontractors shall be attached and made a condition of the Bid. The Bidder expressly understands and agrees to the following provisions:

A. If awarded a Contract as a result of this Bid, the major subcontractors used in the prosecution of the work will be those listed below.
B. The following list includes all subcontractors who will perform work representing 5% (five percent) or more of the total Base Bid.
C. The subcontractors listed below are financially responsible and are qualified to perform the work required.
D. The subcontractors listed below comply with the requirements of the Contract Documents.
E. Any substitutions in the subcontractors listed below shall be requested in writing by the Contractor and must be approved in writing by the Owner. No sub-subcontractors will be allowed unless specifically stated on the form. All pertinent financial, performance, insurance and other applicable information shall be submitted with the request for substitution(s). Owner shall respond to such requests within 14 calendar days following the submission of all necessary information to the full satisfaction of the Owner.
F. Failure to submit the list of Major Subcontractors as stated herein shall constitute a material variation from the Invitation to Bid; and any such Bid may be rejected by the Owner.

Subcontractor Name	Address	Telephone	Area of Work	Minority/Women Owned Business (Yes/No)

(Attach additional sheets if required)

BIDDER: _____

END OF MAJOR SUBCONTRACTORS FORM

Directory of Minority & Women Owned Business Enterprises
Peoria Park District

Revised 6/2020

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3 Keys Construction Tray Keys	MBE Concrete, Roadway Patching, Retaining Walls, Landscaping, Storm Sewer 2314 Lehman Rd., Peoria, IL 61604 threekeysconstruction@yahoo.com	309-472-2721
Absolute Risk Management Strategies Kelly Peterson	MBE Construction Safety, Job Site Safety Plan Development, Job Site Risk Assessment, Construction OSHA Training 416 Main St., Suite 533, Peoria, IL 61602	309-256-8471 309-222-4050 Cell
Adams Septic & Sewer Services, Inc. Michelle Adams	WBE Septic and Sewer Contractor 1641 N. Tiber Ridge Ct., East Peoria, IL 61611	309-691-6113
Aerial Work Services Company	MBE Landscaping and Seeding 13805 Wadsworth Road, Wadsworth, IL	847-662-5321 847-662-5321 Fax
AFE Construction, Inc. Tommy and Monica Arbuckle	WBE General Contractor WBE P.O. Box 199, Mackinaw, IL 61755	309-303-7065 866- 491-2209 Fax Tommy.afeinc@hotmail.com
A & L Salvage, Inc. Archie Brown	MBE Clean Up, Tree Cutting & Removal, Truck Salvaging 824 W. Brons Peoria, IL 61604	309-682-4412
Alexander Brothers Construction Co. Allester Alexander	MBE Concrete, Demolition, Excavation, Landscaping P.O. Box 1508, Peoria, IL 61605	309-673-6768 abrosconst@aol.com
Alexander & Sons Construction Leonard Alexander	MBE Driveways, Curbs, Foundations, Layouts, Sidewalks, etc. 2415 N. Linn Street, Peoria, IL 61604 Leonardalexander1467@yahoo.com	309-678-3004 773-628-9064 (cell)
Allworld Project Management LLC Ronnie Foster Jr.	MBE Highway, Street & Bridge Construction, Water & Sewer Line and Related Construction, Landscaping, Civil Engineering 415 South Front Street, Suite 121, Memphis, TN 38103 procurement@allworldmail.com	901-881-2985
A. Lucas & Sons Steel Margaret Hanley	WBE Structural Steel Fabrication 1328 SW Washington, Peoria, IL 61602	309-673-8547 309-673-7213 Fax Margaret@alucasiron.com
Ambri Inc. Robert J. Hunt. Jr.	MBE Drywall, Flooring, Painting, Cabinetry 9101 S. Nashville Ave., Oak Lawn, IL 60453	708-233-0217 Ph/ Fax
A Unique Maintenance Service Andrea McKnight	MBE Commercial and Industrial Construction Cleanup 1215 N. Sheridan Road, Suite A, Peoria, IL 61606	309-637-4400 309-637-1300 Fax 309-453-3393 Cell
Black Squirrel Services Inc. Aaron Watkins and Joshua Wessels	MBE Skid Steer, Landscaping, Blacktop, Striping, Sealcoating Crack Filling, Crack Routing & Concrete 2037 N. Aspen Road, Peoria, IL 61604	309-369-7817 blacksquirrel@yahoo.com
BMI Contractors & Assoc. Sammy Hobson	MBE Excavation, Concrete 1123 MacQueen., Peoria, IL 61604 bmicontractorsandassociates@comcast.net	309-657-4469 Ph 309-713-1569 Fax
Braun Excavating, Inc. Teresa Braun	WBE Demolition, Digging of Footings, Excavation, Pipe Laying 24 Gulf Stream, Bartonville, IL 61607	309-697-5454 309-697-6567 Fax
Brown, Leo Trucking, Inc. Leo Brown	MBE Trucking/Hauling P. O. Box 9057, Peoria, IL 61612	309-685-6710 309-685-0759 Fax
Buddy's Landscaping Dexter Davis	MBE Landscaping P. O. Box 1836, Bloomington, IL 61702	309-824-9211 309-454-3342 Fax Dexterdavis2@aol.com
Burnside Brothers Construction Terry Burnside	MBE Landscaping, General Construction 3563 SW Adams, Peoria, IL 61605	309-922-9390

C and G Concrete Construction Co. Inc. Patricia Slusher	WBE Concrete Rodney@cngconcrete.com	309-699-0384 309-699-6922 Fax 309-208-2646 Cell
Capitol Trucking Eddie Washington	MBE Trucking, Snow Removal 2803 Creston Lane, Peoria, IL 61604	309-339-5313
Central IL Construction Inc. Jessica Youngman	WBE Land Surveying 416 Germantown Rd., Germantown, IL 61548	309-383-3156
Central IL Consulting Jessica Youngman	WBE Land Surveying 416 Germantown Rd., Germantown, IL 61548	309-383-3156 youngman@mtco.com
Central IL Rebar Insulators Roger Fleming	MBE Structural Steel and Rebar Replacement 4719 Ridgelawn Place, Peoria, IL 61615	309-258-1379 888-387-5716 Fax 309-258-1379 Cell
Central Landscaping Donna Brandenburg	WBE Seeding, Landscaping 12512 Mendell Rd., Princeville, IL 61559	309-385-4832 309-385-2644 Fax
CJL Landscaping, Inc. Rebecca J. Kelch	WBE Landscaping 10902 W. U. S. Highway 150, Brimfield, IL 61517	309-691-9200 309-691-5131 Fax Meinders_81@yahoo.com jrdoering@att.net
Clevenger Contractors Inc. Verlee Clevenger Misty L. Daham	WBE Guardrail, Bridge Rail, Seeding, Fencing 355 Naples Rd., P.O. Box 19, Bluffs, IL 62621	217-754-3411 217-754-3537 Fax clever@irtc.net
CNS Forestry & Landscaping LLC Christine Schilling	WBE Landscaping, Seeding, Sodding, Tree Removal 1813 1000th St., Lincoln, IL 62656	217-792-3808 217-792-3808 Fax
Concrete to Perfection Elonda Whitfield	WBE/MBE Designs on Concrete concretetoperfection@gmail.com	309-681-9508
Cordova Construction Tina Christopher	WBE Concrete Removal, Curb & Gutter Removal, Sidewalk Removal 2424 N. Ellory Road, Peoria, IL 61615	309-674-8810 309-208-3448 Cell
Cornerstone Builders & Developers Ron Touilly	WBE 6129 W. Southport Rd., Peoria, IL 61615	309-674-9000 309-673-7783 Fax
Creative Touch Painting Chris Ridge	MBE Painting Exterior/Interior 3318 N. Isabell Ave., Peoria, IL 61604	309-229-1253 309-643-7400 Cell info@creativetouchpnt.com
CSS (Construction Specialties & Services) Dave Suzuki	MBE Building Specialties, Design, Engineering, Estimating P. O. Box 120703 Peoria, IL 61614	309-685-8453
CWG Inc. Teresa Gustafson	WBE Demolition, Excavation, Trucking 24635 Cooper Rd., Morton, IL 61550	309-208-5461 Cell 309-208-8899 Cell tgusdesigns@yahoo.com
Davis Brothers Construction Company Russell Davis	MBE Trucking/Hauling 1522 W. Kettelle St. Peoria, IL 61605	309-683-6931
DECA Realty Eddie J. Washington	MBE Real Estate Broker, Appraiser 417 W. Main, Peoria, IL 61606	309-637-3322 309-682-3922 Fax
Design Air Inc. Courtney Eston	MBE Commercial Air Duct Cleaning 3806 W. Hearthwood Dr., Dunlap, IL 61525	309-693-8632 309-243-2102 Fax
Dunbar Transfer	WBE Trucking P.O. Box 315, Chillicothe, IL 61523-0315	309-303-5122
E & D Trucking and Hauling, Inc. Eddie Proctor	MBE Trucking/Hauling 1913 N. Idaho, Peoria, IL 61604	309-682-4336 309-251-6736 Cell
E. Davis Trucking Company Eric Davis	MBE Trucking edavistrucking@gmail.com	309-648-1450
Earth Care Unlimited, Inc. Monica Thornley	WBE Landscaping, Seeding, Sodding 3108 Panther Grove Rd, Ashland, IL 62612	217-452-7370 217-414-4321

Fire & Ice Heating and Air J.T. Toombs	MBE HVAC Maintenance, Installment 922 W. Smith St., Peoria, IL 61605	309-219-3708
Foster-Jacob Electric Emily Rudesill	WBE Electrical 826 W. Main St., Peoria, IL 61606	309-674-8129
Fuhrmann Engineering Inc. Kathy Shelter	WBE Civil Engineers / Land Surveyors 456 Fulton St., Suite 146	309-713-3498 Ext. 5
Flessner Electric	WBE Electrical 3600 S. Cameron Ln., Mapleton, IL 61547	309-697-2484
Foster-Jacob Electric Emily Rudesill	WBE Electrical 826 W. Main St., Peoria, IL 61606	309-674-8129 309-674-6890 Fax emilyj@fosterjacob.com
Garza Heating & Cooling	MBE HVAC 1304 S. Western Ave., Peoria, IL 61605	309-645-6294
Get Current Electrical Serv. Richard Rhodes	MBE Electrical 4210 N. Northbrook Ct. Richard_rhodes2001@yahoo.com	309-989-7931
Ronald A. Givens & Associates Ronald A. Givens	MBE Insurance & Investments 2616 N. Lehman, Peoria, IL 61602	309-685-4588 309-676-3152 Fax
GIVSCO Construction Ronald Givens	MBE General Contractor 2321 Lakeshore Dr., Pekin, IL 61554	309-620-9127 info@givsco.com
Gutters & More	WBE 157 Thunderbird Ln., East Peoria, IL 61611	309-694-4000 309-694-3356 Fax
Hancock Trucking, Inc. Nancy Hancock	WBE Trucking/Hauling 30570 Hancock Road Mackinaw, IL 61755	309-447-6733
Hanley Steel, Inc. Jill Hanley	WBE Fabricated Structural and Miscellaneous Steel 8811 N. Industrial Rd., Peoria, IL 61615	309-692-5250 309-692-5251 Fax
Heart Technologies Jim Bainter, Brad Armstrong	WBE Data and Telephone, Communication and Construction 3105 N. Main Street, Peoria, IL 61611	309-427-7000 309-427-7007 Fax
Hermann & Associates Alisha Hermann	WBE Consultant Engineering 5835 N. Galena Rd., Peoria, IL 61614	309-687-5566 309-687-0571 Fax
Horan Construction, Inc. Susan Arnholt	WBE Carpentry, Concrete, Demolition, General, Wrecking 1720 W. Chanute Road Peoria, IL 61615	309-691-3133 309-691-1841 Fax
Illinois Mechanical Service & Design Beth Ward	WBE HVAC P.O. Box 10494, Peoria, IL 61612	309-713-3640 309-274-6941
Infrastructure Engineering Thu Truitt	MBE Civil Engineering 456 Fulton St., Suite 104, Peoria, IL 61602	309-637-9200 309-637-9210
Intech Innovations John McCrary	WBE Audio/Video Design and Integration Washington, IL 61571	309-370-6676 309-745-9691 Fax
Interlock Brick Paving Chris Joos	WBE Hardscaping, Landscaping, Excavating P.O. Box 6, Morton, IL 61550 chris@interlockbrickpaving.com	309-696-9264
JC Construction Frank Coates	MBE General 1810 Stever, Peoria, IL 61605	309-303-3919 Cell
JAKS Construction Inc John Spencer	Disabled Vet Full Service Concrete Cutting, Drilling & Sealing 19319 Great Crane Road, Bloomington, IL 61705	800-455-9662 309-455-9662 Fax 309-846-6382 Cell jaksinc@live.com
J & K Construction James Tillman	MBE General 4003 N. Rochelle, Peoria, IL 61615	309-685-8554 309-685-8554 Fax 309-264-3903 Cell j&kconst@comcast.net
J & J Construction Herman Johnson	MBE Concrete Removal, Curb & Gutter Removal, Demolition 1300 W. Aiken Avenue, Peoria, IL 61605	309-657-9228 309-676-8292 Fax 309-657-9228 Cell

JM Industrial Supply Ron Given	MBE Maintenance Items, Tools, Soaps 2323 Lakeshore, Pekin, IL 61554	309-346-5796 309-347-5100 Fax
Jones Electrical Contractors, Inc. Ronald Jones	MBE Electrical	309-339-7690 rj@joneselectricalco.com
Kahbeah Contracting & Trucking Larry Kahbeah	MBE Trucking/Hauling 510 N. Yates, P. O. Box 56, Tallula, IL 62688	217-634-4157 217-634-4157 Fax
Kerry Brown Trucking Leo K. Brown	MBE Tandem, Semi Dump, General Hauling Peoria, IL	309-251-6089 Cell leok.brown1957@gmail.com
Kreiling Roofing Co.	WBE Slate, Wood Shakes, Tile, Thatch, Custom Fabricated Copper and Steel, Residential and Commercial 2335 W. Altorfer Dr., Peoria, IL 61615	309-673-3649 309-692-2504 Fax 309-397-7747 Cell lmoore@kreiling.com
Leo Brown Trucking Inc Leo Brown	MBE Trucking PO Box 9057, Peoria, IL 61612	309-685-6710 309-685-0759 Fax 309-303-7111 Cell
LIZZ Trucking & Hauling Brandon Hines	MBE Trucking/Hauling lizztrucking@yahoo.com	309-208-5942
LNR Construction & Trucking Demonte Davis Lavael Randle Sr.	MBE Concrete, Trucking 2200 N. Linsley St., Peoria, IL 61605	309-682-6331 309-682-6331 Fax 309-678-3314 Cell
LV Enterprise John L. Palmer	MBE Trucking/Hauling 303 E. Archer Avenue, Peoria, IL 61603	309-657-2420 309-682-8872 Fax
M & A Plumbing Michael Abner	MBE Plumbing 6216 N. Devonshire Avenue, Peoria, IL 61615	309-689-0133 309-689-0133 Fax
M&K Heating & Cooling Reggie Williams	MBE HVAC 2406 W. Newman Parkway, Peoria, IL 61604	309-256-6129
M & L Plumbing Manzell Lawson	MBE Plumbing 1309 W. Lincoln, Peoria, IL 61605	309-674-8466
McGinnis Transportation Beth McGinnis	WBE Trucking, Tandem, 24" Box Truck 336 Riverview Drive, Creve Coeur, IL 61610	309-369-4465 309-694-1604 Fax
Michlyn Corporation Fred Danage	MBE Concrete, Landscaping, Lead Based Paint Abatement P.O. Box 5895, Peoria, IL 61601	309-829-2115 309-303-1561 Cell macdanage@yahoo.com
Mid-Illinois Companies, Corp. Debra Young	WBE Metal Framing, Insulation, Drywall, Plaster and Exterior Insulation, Acoustical Ceilings and Wall Panels, Painting and Wall Covering, Access Flooring 905 NE Adams St., Peoria, IL 61603	309-674-0717 309-674-5802 Fax dyoung@mic123.com
Midwest Construction Services Sheila Shover	M/WBE Traffic Control Products, Trucking/Hauling P. O. Box 4185, Bartonville, IL 61607	309-697-1000 309-697-1004 Fax
Millennia Professional Services of IL Paul Moreno	MBE Civil Engineering, Erosion Control, Landscaping, Sewer Construction, Surveying, Retaining Walls 850 N. Main St., Morton, IL 61550	309-321-8141 309-321-8142 Fax 309-303-8428 Cell pmoreno@mps-il.com
Molleck Electric	WBE Electrical 14926 W. Winchester Dr., Brimfield, IL 61517	309-446-3483
N.E. Rudd Trucking Nanette E Jenkins-Rudd	WBE Excavating, Hauling, Asphalt, Dirt, Gravel, Sand Milling ; Dumps and Tandems PO Box 14, Kingston Mines, IL 61539	309-389-4150 309-389-2849 Fax 309-360-7986 Cell
Ordaz Construction Co. Inc. Elizabeth Ordaz Mercer	WBE Concrete 8010 N. Sommer St., Peoria, IL 61615 lindahall@ordazconstruction.com	309-693-3338 309-693-5505 Fax
P.A. Atherton Construction Inc. Patricia Atherton	WBE Aggregate Pipe, Asphalt, Concrete, Demolition Excavation, Grading, Pavement Patching & Marking	309-822-8575 309-822-8782 Fax 309-645-9870 Cell

Porter, V. L. Vincent Porter	MBE Concrete, General 500 W. North, Suite 10, Springfield, IL 62704	217-744-8050
Prairie Engineers of Illinois PC Colleen Ayars	WBE Civil Engineering, Surveying ,Environmental Consulting 926 SW Adams Street, Suite 120, Peoria, IL 61602 www.prairieengineers.com	309-839-2642 217-718-4764 Fax
Reign Construction Bridget Booker	WBE/MBE Iron Worker 801 W. Main St., Suite A118, Peoria, IL 61606 bridget@reignconstructioninc.com	309-495-7982 309-495-7996 Fax 309-750-4846 Cell
RNS Electric Inc. Regina Slonneger	WBE Electrical 28558 Irish Lane, Washington, IL 61571	309-444-5200 309-444-5201 Fax
Rudd Trucking Nanette Jenkins-Rudd	WBE Trucking/Hauling P.O. Box 14, 107 Washington St., Kingston Mines, IL 61539	309-389-4150 309-389-2849 Fax
Rufus Construction Company Rufus Nelson	MBE Painting, Roofing, Remodeling 1819 S. Idaho Street, Peoria, IL 61605	309-673-6776 309-497-9453 Cell
Searle Trucking, Inc. Debbie Searle	WBE Trucking/Hauling P. O. Box 1084, Peoria, IL 61653	309-686-0708 309-688-5365 Fax
Serenity Electric	MBE Electrical PO Box 6521, Peoria, IL 61601 jamesltaylor1955@yahoo.com	309-363-5067 309-363-5067 Cell
Sherwin Baker & Associates Inc. Sherwin Baker	MBE Engineering Technical Service, Construction Management 103 E. Archer, Peoria, IL 61603	309-688-4203 309-682-4203 Fax 309-678-2897 Cell sherwin_baker@yahoo.com
Tabitha Ventures, Inc. Edward O. Taiwo	MBE Asphalt, Concrete, Demolition, Earthwork, Electrical, Excavation, General, HVAC, Landscaping, Painting, Plumbing, Resurfacing, Roofing, Trucking/Hauling 100 N. Main Street, Suite 203, East Peoria, IL 61611	309-692-1473 309-692-1564 Fax information@tabithainc.com
TEMCO Heating & AC Ellen Robinson	WBE Heating & AC 913 Laramie St. Peoria, IL 61605	309-637-7746
The Communication Connection Jennifer Stone	WBE Communication, Wire and Cable, Electrical and Telephone Prod. 604 Filmore Street Harrisburg, PA 17104	717-561-7267
Third Hand Landscaping Tommy Harris	MBE Landscaping 2313 W. Lincoln, Peoria, IL 61605	309-673-6702
Three Cross Development J. T. Donelson	MBE Concrete, General, Sidewalk 1519 W. Millman Peoria, IL 61605	309-637-1238
Thompson Brothers Inc. Todd Thompson	MBE General Carpentry and Construction, Interior Finish Work, Millwork 221 Court St., Pekin, IL 61554	309-613-0254
Thornton Rave dba Illini Concrete Co. of Illinois	MBE Precast and Prestressed Concrete, Demolition, Excavating and Grading, Drainage, Aggregate Bases and Surfaces, Pavement Patching 929 E. Grove St., Suite A, Bloomington, IL 61701	309-585-2376 309-585-2472 Fax 309-706-9213 Cell thorntonrave01@gmail.com
Tillman Electric James Tillman	MBE Electrical 4003 N. Rochelle, Peoria, IL 61615	309-685-8554 309-264-3903 Cell
Willie Veneble Construction Willie Venable	MBE Construction, Concrete Removal, Demolition 1000 E. Wilcox, Peoria, IL 61605	309-686-1429 309-360-0757 Cell
Willis Electric Phyllis Willis	WBE Electrical P.O. Box 545, Chillicothe, IL 61523	309-579-2926

Peoria County Prevailing Wage Rates posted on 12/1/2020

						Overtime								
Trade Title	**Rg**	**Type**	**C**	**Base**	**Foreman**	**M-F**	**Sa**	**Su**	**Hol**	**H/W**	**Pension**	**Vac**	**Trng**	**Other Ins**
ASBESTOS ABT-GEN	All	BLD		27.50	29.00	1.5	1.5	2.0	2.0	8.50	21.41	0.00	0.80	
ASBESTOS ABT-GEN	All	HWY		31.27	32.77	1.5	1.5	2.0	2.0	8.50	23.88	0.00	0.80	
ASBESTOS ABT-MEC	All	BLD		32.96	35.60	1.5	1.5	2.0	2.0	14.07	12.30	0.00	0.77	
BOILERMAKER	All	BLD		41.00	44.00	1.5	1.5	2.0	2.0	7.07	20.57	0.00	1.24	
BRICK MASON	All	BLD		35.95	37.45	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.85	
CARPENTER	All	BLD		33.58	35.83	1.5	1.5	2.0	2.0	8.90	19.50	0.00	0.70	
CARPENTER	All	HWY		36.16	38.41	1.5	1.5	2.0	2.0	8.90	20.50	0.00	0.67	
CEMENT MASON	All	BLD		31.48	33.23	1.5	1.5	2.0	2.0	9.00	18.94	0.00	0.66	
CEMENT MASON	All	HWY		32.98	34.48	1.5	1.5	2.0	2.0	9.00	19.47	0.00	0.68	
CERAMIC TILE FINISHER	All	BLD		33.46		1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.84	
ELECTRIC PWR EQMT OP	All	ALL		47.70	56.60	1.5	1.5	2.0	2.0	7.93	13.36	0.00	0.72	
ELECTRIC PWR GRNDMAN	All	ALL		32.41	56.60	1.5	1.5	2.0	2.0	7.47	9.07	0.00	0.48	
ELECTRIC PWR LINEMAN	All	ALL		53.09	56.60	1.5	1.5	2.0	2.0	8.09	14.86	0.00	0.80	
ELECTRIC PWR TRK DRV	All	ALL		34.02	56.60	1.5	1.5	2.0	2.0	7.52	9.53	0.00	0.51	
ELECTRICIAN	All	BLD		38.25	40.75	1.5	1.5	2.0	2.0	8.15	13.45	0.00	0.80	
ELECTRONIC SYSTEM TECH	All	BLD		30.65	32.65	1.5	1.5	2.0	2.0	7.70	12.77	0.00	0.40	
ELEVATOR CONSTRUCTOR	All	BLD		47.72	53.68	2.0	2.0	2.0	2.0	15.72	18.41	3.82	0.63	
GLAZIER	All	BLD		36.16	38.16	1.5	1.5	1.5	2.0	12.67	9.74	0.00	1.25	
HEAT/FROST INSULATOR	All	BLD		43.95	46.59	1.5	1.5	2.0	2.0	14.07	13.76	0.00	0.77	
IRON WORKER	All	BLD		33.06	34.96	1.5	1.5	2.0	2.0	11.51	17.87	0.00	0.84	
IRON WORKER	All	HWY		38.66	40.66	1.5	1.5	2.0	2.0	11.51	17.87	0.00	0.99	
LABORER	All	BLD		26.50	28.00	1.5	1.5	2.0	2.0	8.50	21.41	0.00	0.80	
LABORER	All	HWY		30.52	32.02	1.5	1.5	2.0	2.0	8.50	23.88	0.00	0.80	
LABORER, SKILLED	All	BLD		26.90	28.40	1.5	1.5	2.0	2.0	8.50	21.41	0.00	0.80	
LABORER, SKILLED	All	HWY		30.82	32.32	1.5	1.5	2.0	2.0	8.50	23.88	0.00	0.80	
LATHER	All	BLD		33.58	35.83	1.5	1.5	2.0	2.0	8.90	19.50	0.00	0.70	
MACHINERY MOVER	All	HWY		38.66	40.66	1.5	1.5	2.0	2.0	11.51	17.87	0.00	0.99	
MACHINIST	All	BLD		49.68	52.18	1.5	1.5	2.0	2.0	7.93	8.95	1.85	1.47	
MARBLE FINISHER	All	BLD		33.46		1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.84	
MARBLE MASON	All	BLD		36.70	37.95	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.86	
MILLWRIGHT	All	BLD		33.06	35.31	1.5	1.5	2.0	2.0	8.90	20.37	0.00	0.70	

MILLWRIGHT	All	HWY		36.40	38.65	1.5	1.5	2.0	2.0	8.90	20.85	0.00	0.67	
OPERATING ENGINEER	All	BLD	1	42.05	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
OPERATING ENGINEER	All	BLD	2	38.93	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
OPERATING ENGINEER	All	BLD	3	33.78	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
OPERATING ENGINEER	All	HWY	1	42.05	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
OPERATING ENGINEER	All	HWY	2	38.93	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
OPERATING ENGINEER	All	HWY	3	33.78	45.05	1.5	1.5	2.0	2.0	10.50	21.25	0.00	3.60	
PAINTER	All	ALL		37.67	39.67	1.5	1.5	1.5	2.0	15.38	7.20	0.00	1.35	
PAINTER - SIGNS	All	BLD		39.84	44.74	1.5	1.5	2.0	2.0	2.73	3.39	0.00	0.00	
PILEDRIVER	All	BLD		34.58	36.83	1.5	1.5	2.0	2.0	8.90	19.50	0.00	0.70	
PILEDRIVER	All	HWY		36.16	38.41	1.5	1.5	2.0	2.0	8.90	20.50	0.00	0.67	
PIPEFITTER	All	BLD		39.60	43.96	1.5	1.5	2.0	2.0	7.75	14.58	0.00	1.16	
PLASTERER	All	BLD		30.30	31.80	1.5	1.5	2.0	2.0	9.00	19.18	0.00	0.90	
PLUMBER	All	BLD		36.22	39.48	1.5	1.5	2.0	2.0	7.75	16.21	0.00	1.25	
ROOFER	All	BLD		32.00	35.20	1.5	1.5	2.0	2.0	9.50	10.79	0.00	0.30	
SHEETMETAL WORKER	All	BLD		34.74	36.48	1.5	1.5	2.0	2.0	10.22	18.30	0.00	1.02	
SIGN HANGER	All	HWY		38.66	40.66	1.5	1.5	2.0	2.0	11.51	17.87	0.00	0.99	
SPRINKLER FITTER	All	BLD		41.97	44.72	1.5	1.5	2.0	2.0	10.23	14.02	0.00	0.52	
STEEL ERECTOR	All	HWY		38.66	40.66	1.5	1.5	2.0	2.0	11.51	17.87	0.00	0.99	
STONE MASON	All	BLD		35.95	37.45	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.85	
TERRAZZO FINISHER	All	BLD		33.46		1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.84	
TERRAZZO MASON	All	BLD		36.70	37.95	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.86	
TILE MASON	All	BLD		36.70	37.95	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.86	
TRUCK DRIVER	All	ALL	1	38.93	43.17	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	ALL	2	39.50	43.17	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	ALL	3	39.77	43.17	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	ALL	4	40.14	43.17	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	ALL	5	41.21	43.17	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	O&C	1	31.14	34.54	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	O&C	2	31.60	34.54	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	O&C	3	31.82	34.54	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	O&C	4	32.11	34.54	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TRUCK DRIVER	All	O&C	5	32.97	34.54	1.5	1.5	2.0	2.0	13.52	6.62	0.00	0.25	
TUCKPOINTER	All	BLD		35.95	37.45	1.5	1.5	2.0	2.0	10.85	12.10	0.00	0.85	

Legend
Rg Region
Type Trade Type - All,Highway,Building,Floating,Oil & Chip,Rivers
C Class
Base Base Wage Rate
OT M-F Unless otherwise noted, OT pay is required for any hour greater than 8 worked each day, Mon through Fri. The number listed is the multiple of the base wage.
OT Sa Overtime pay required for every hour worked on Saturdays
OT Su Overtime pay required for every hour worked on Sundays
OT Hol Overtime pay required for every hour worked on Holidays
H/W Health/Welfare benefit
Vac Vacation
Trng Training
Other Ins Employer hourly cost for any other type(s) of insurance provided for benefit of worker.

Explanations PEORIA COUNTY

The following list is considered as those days for which holiday rates of wages for work performed apply: New Years Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Christmas Day and Veterans Day in some classifications/counties. Generally, any of these holidays which fall on a Sunday is celebrated on the following Monday. This then makes work performed on that Monday payable at the appropriate overtime rate for holiday pay. Common practice in a given local may alter certain days of celebration. If in doubt, please check with IDOL.

Oil and chip resealing (O&C) means the application of road oils and liquid asphalt to coat an existing road surface, followed by application of aggregate chips or gravel to coated surface, and subsequent rolling of material to seal the surface.

EXPLANATION OF CLASSES

ASBESTOS - GENERAL - removal of asbestos material/mold and hazardous materials from any place in a building, including mechanical systems where those mechanical systems are to be removed. This includes the removal of asbestos materials/mold and hazardous materials from ductwork or pipes in a building when the building is to be demolished at the time or at some close future date.

ASBESTOS - MECHANICAL - removal of asbestos material from mechanical systems, such as pipes, ducts, and boilers, where the mechanical systems are to remain.

CERAMIC TILE FINISHER, MARBLE FINISHER, TERRAZZO FINISHER

Assisting, helping or supporting the tile, marble and terrazzo mechanic by performing their historic and traditional work assignments required to complete the proper installation of the work covered by said crafts. The term "Ceramic" is used for naming the classification only and is in no way a limitation of the product handled. Ceramic takes into consideration most hard tiles.

ELECTRONIC SYSTEMS TECHNICIAN

Installation, service and maintenance of low-voltage systems which utilizes the transmission and/or transference of voice, sound, vision, or digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background/foreground music, intercom and telephone interconnect, field programming, inventory control systems, microwave transmission, multi-media, multiplex, radio page, school, intercom and sound burglar alarms and low voltage master clock systems.

Excluded from this classification are energy management systems, life safety systems, supervisory controls and data acquisition systems not intrinsic with the above listed systems, fire alarm systems, nurse call systems and raceways exceeding fifteen feet in length.

LABORER, SKILLED - BUILDING

The skilled laborer building (BLD) classification shall encompass the following types of work, irrespective of the site of the work: cutting & acetylene torch, gunnite nozzlemen, gunnite pump men & pots, kettlemen & carriers of men handling hot stuff, sandblaster nozzle men, sandblasting pump men & pots, setting up and using concrete burning bars, wood block setters, underpinning & shoring of existing buildings, and the unload-ing and handling of all material coated with creosote.

LABORER, SKILLED - HIGHWAY

The skilled laborer heavy & highway (HWY) classification shall encompass the following types of work,irrespective of the site of the work: jackhammer & drill operator, gunite pump & pot man, puddlers, vibrator men, wire fabric placer, sandblast pump & pot man, strike off concrete, unloading, handling & carrying of all creosoted piles, ties or timber, concrete burning bars, power wheelbarrows or buggies, asphalt raker, brickset-ters, cutting torchman (electric & acetylene), men setting lines to level forms, form setters, gunite nozzle man & sandblasting nozzle man, power man, and rip-rapping by hand.

TRUCK DRIVER - BUILDING, HEAVY AND HIGHWAY CONSTRUCTION Class 1. Drivers on 2 axle trucks hauling less than 9 ton. Air compressor and welding machines and brooms, including those pulled by separate units, truck driver helpers, warehouse employees, mechanic helpers, greasers and tiremen, pickup trucks when hauling materials, tools, or workers to and from and on-the-job site, and fork lifts up to 6,000 lb. capacity.

Class 2. Two or three axle trucks hauling more than 9 ton but hauling less than 16 ton. A-frame winch trucks, hydrolift trucks, vactor trucks or similar equipment when used for transportation purposes. Fork lifts over 6,000 lb. capacity, winch trucks, four axle combination units, and ticket writers.

Class 3. Two, three or four axle trucks hauling 16 ton or more. Drivers on water pulls, articulated dump trucks, mechanics and working forepersons, and dispatchers. Five axle or more combination units.

Class 4. Low Boy and Oil Distributors.

Class 5. Drivers who require special protective clothing while employed on hazardous waste work.

TRUCK DRIVER - OIL AND CHIP RESEALING ONLY.

This shall encompass laborers, workers and mechanics who drive contractor or subcontractor owned, leased, or hired pickup, dump, service, or oil distributor trucks. The work includes transporting materials and equipment (including but not limited to, oils, aggregate supplies, parts, machinery and tools) to or from the job site; distributing oil or liquid asphalt and aggregate; stock piling material when in connection with the actual oil and chip contract. The Truck Driver (Oil & Chip Resealing) wage classification does not include supplier delivered materials.

OPERATING ENGINEERS - BUILDING

Class 1. Cranes; Overhead Cranes; Gradall; All Cherry Pickers; Mechanics; Central Concrete Mixing Plant Operator; Road Pavers (27E - Dual Drum - Tri Batchers); Blacktop Plant Operators and Plant Engineers; 3 Drum Hoist; Derricks; Hydro Cranes; Shovels; Skimmer Scoops; Koehring Scooper; Drag Lines; Backhoe; Derrick Boats; Pile Drivers and Skid Rigs; Clamshells; Locomotive Cranes; Dredge (all types) Motor Patrol; Power Blades - Dumore - Elevating and similar types; Tower Cranes (Crawler-Mobile) and Stationary; Crane-type Backfiller; Drott Yumbo and similar types considered as Cranes; Caisson Rigs; Dozer; Tournadozer; Work Boats; Ross Carrier; Helicopter; Tournapulls - all and similar types; Scoops (all sizes); Pushcats; Endloaders (all types); Asphalt

Surfacing Machine; Slip Form Paver; Rock Crusher; Heavy Equipment Greaser; CMI, CMI Belt Placer, Auto Grade & 3 Track and similar types; Side Booms; Multiple Unit Earth Movers; Creter Crane; Trench Machine; Pump-crete-Belt Crete-Squeeze Cretes-Screw-type Pumps and Gypsum; Bulker & Pump - Operator will clean; Formless Finishing Machine; Flaherty Spreader or similar types; Screed Man on Laydown Machine; Wheel Tractors (industrial or Farm-type w/Dozer-Hoe-Endloader or other attachments); F.W.D. & Similar Types; Vermeer Concrete Saw.

Class 2. Dinkeys; Power Launches; PH One-pass Soil Cement Machine (and similar types); Pugmill with Pump; Backfillers; Euclid Loader; Forklifts; Jeeps w/Ditching Machine or other attachments; Tuneluger; Automatic Cement and Gravel Batching Plants; Mobile Drills (Soil Testing) and similar types; Gurries and Similar Types; (1) and (2) Drum Hoists (Buck Hoist and Similar Types); Chicago Boom; Boring Machine & Pipe Jacking Machine; Hydro Boom; Dewatering System; Straw Blower; Hydro Seeder; Assistant Heavy Equipment Greaser on Spread; Tractors (Track type) without Power Unit pulling Rollers; Rollers on Asphalt -- Brick Macadem; Concrete Breakers; Concrete Spreaders; Mule Pulling Rollers; Center Stripper; Cement Finishing Machines & CMI Texture & Reel Curing Machines; Cement Finishing Machine; Barber Green or similar loaders; Vibro Tamper (All similar types) Self-propelled; Winch or Boom Truck; Mechanical Bull Floats; Mixers over 3 Bag to 27E; Tractor pulling Power Blade or Elevating Grader; Porter Rex Rail; Clary Screed; Truck Type Hoptoe Oilers; Fireman; Spray Machine on Paving; Curb Machines; Truck Crane Oilers; Oil Distributor; Truck-Mounted Saws.

Class 3. Air Compressor; Power Subgrader; Straight Tractor; Trac Air without attachments; Herman Nelson Heater, Dravo, Warner, Silent Glo, and similar types; Roller: Five (5) Ton and under on Earth or Gravel; Form Grader; Crawler Crane & Skid Rig Oilers; Freight Elevators - permanently installed; Pump; Light Plant; Generator; Conveyor (1) or (2) - Operator will clean; Welding Machine; Mixer (3) Bag and Under (Standard Capacity with skip); Bulk Cement Plant; Oiler on Central Concrete Mixing Plant.

OPERATING ENGINEERS - HEAVY AND HIGHWAY CONSTRUCTION

CLASS 1. Cranes; Hydro Cranes; Shovels; Crane Type Backfiller; Tower, Mobile, Crawler, & Stationary Cranes; Derricks; Hoists (3 Drum); Draglines; Drott Yumbo & Similar Types considered as Cranes; 360 Degree Swing Excavator (Shears, Grapples, Movacs, etc.); Back Hoe; Derrick Boats; Pile Driver and Skid Rigs; Clam Shell; Locomotive - Cranes; Road Pavers - Single Drum - Dual Drum - Tri Batcher; Motor Patrols & Power Blades - Dumore - Elevating & Similar Types; Mechanics; Central Concrete Mixing Plant Operator; Asphalt Batch Plant Operators and Plant Engineers; Gradall; Caisson Rigs; Skimmer Scoop - Koering Scooper; Dredges (all types); Hoptoe; All Cherry Pickers; Work Boat; Ross Carrier; Helicopter; Dozer; Tournadozer; Tournapulls - all and similar types; Operation of Concrete and all Recycle Machines; Multiple Unit Earth Movers; Scoops (all sizes); Pushcats; Endloaders (all types); Asphalt Surfacing Machine; Slip Form Paver; Rock Crusher; Operation of Material Crusher, Screening Plants, and Tunnel Boring Machine; Heavy Equipment Greaser (top greaser on spread); CMI, Auto Grade, CMI Belt Placer & 3 Track and Similar Types; Side Booms; Asphalt Heater & Planer Combination (used to plane streets); Wheel Tractors (with Dozer, Hoe or Endloader Attachments); CAT Earthwork Compactors and Similar Types; Blaw Knox Spreader and Similar Types; Trench Machines; Pump Crete - Belt Crete - Squeeze Crete - Screw Type Pumps and Gypsum (operator will clean); Creter Crane; Operation of Concrete Pump Truck; Formless Finishing Machines; Flaherty Spreader or Similar Types; Screed Man on Laydown Machine; Vermeer Concrete Saw; Operation of Laser Screed; Span Saw; Dredge Leverman; Dredge Engineer; Lull or Similar Type; Hydro-Boom Truck; Operation of Guard Rail Machine; and Starting Engineer on Pipeline or Construction (11 or more pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted - Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc, and Ground Heater (Trailer Mounted).

CLASS 2. Bulker & Pump; Power Launches; Boring Machine & Pipe Jacking Machine; Dinkeys; Operation of Carts, Powered Haul Unit for a Boring Machine; P & H One Pass Soil Cement Machines and Similar Types; Wheel Tractors (Industry or Farm Type - Other); Back Fillers; Euclid Loader; Fork Lifts; Jeep w/Ditching Machine or Other Attachments; Tunneluger; Automatic Cement & Gravel Batching Plants; Mobile Drills - Soil Testing and Similar Types; Pugmill with Pump; All (1) and (2) Drum Hoists; Dewatering System; Straw Blower; Hydro-Seeder; Bump Grinders (self-propelled); Assistant Heavy Equipment Greaser; Apsco Spreader; Tractors (Track-Type) without Power Units Pulling Rollers; Rollers on Asphalt - Brick or Macadam; Concrete Breakers; Concrete

Spreaders; Cement Strippers; Cement Finishing Machines & CMI Texture & Reel Curing Machines; Vibro-Tampers (All Similar Types Self-Propelled); Mechanical Bull Floats; Self-Propelled Concrete Saws; Truck Mounted Power Saws; Operation of Curb Cutters; Mixers - Over Three (3) Bags; Winch and Boom Trucks; Tractor Pulling Power Blade or Elevating Grader; Porter Rex Rail; Clary Screed; Mule Pulling Rollers; Pugmill without Pump; Barber Greene or Similar Loaders; Track Type Tractor w/Power Unit attached (minimum); Fireman; Spray Machine on Paving; Curb Machines; Paved Ditch Machine; Power Broom; Self-Propelled Sweepers; Self-Propelled Conveyors; Power Subgrader; Oil Distributor; Straight Tractor; Truck Crane Oiler; Truck Type Oilers; Directional Boring Machine; Horizontal Directional Drill; Articulating End Dump Vehicles; Starting Engineer on Pipeline or Construction (6 -10 pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted - Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc., and Ground Heater (Trailer Mounted).

CLASS 3. Straight Framed Truck Mounted Vac Unit (separately powered); Trac Air Machine (without attachments); Rollers - Five Ton and Under on Earth and Gravel; Form Graders; Bulk Cement Plant; Oilers; and Starting Engineer on Pipeline or Construction (3 - 5 pieces) including: Air Compressor (Trailer Mounted), All Forced Air Heaters (regardless of Size), Water Pumps (Greater than 4-1/2" or Total Discharge Over 4-1/2"), Light Plants, Generators (Trailer Mounted - Excluding Decontamination Trailer), Welding Machines (Any Size or Mode of Power), Conveyor, Mixer (any size), Stud Welder, Power Pac, etc., and Ground Heater (Trailer Mounted).

Other Classifications of Work:

For definitions of classifications not otherwise set out, the Department generally has on file such definitions which are available. If a task to be performed is not subject to one of the classifications of pay set out, the Department will upon being contacted state which neighboring county has such a classification and provide such rate, such rate being deemed to exist by reference in this document. If no neighboring county rate applies to the task, the Department shall undertake a special determination, such special determination being then deemed to have existed under this determination. If a project requires these, or any classification not listed, please contact IDOL at 217-782-1710 for wage rates or clarifications.

LANDSCAPING

Landscaping work falls under the existing classifications for laborer, operating engineer and truck driver. The work performed by landscape plantsman and landscape laborer is covered by the existing classification of laborer. The work performed by landscape operators (regardless of equipment used or its size) is covered by the classifications of operating engineer. The work performed by landscape truck drivers (regardless of size of truck driven) is covered by the classifications of truck driver.

SAMPLE ADDENDUM

Peoria Park District
Planning, Design and Construction Department
1314 N. Park Road
Peoria, IL 61604
Telephone: (309) 686-3386

ADDENDUM NO.

PROJECT TITLE:

ISSUANCE DATE:

LOCATION:

The proposed Contract Documents for this Work are modified as follows:

I. GENERAL INFORMATION:

II. **DRAWINGS**: (Delete/Change/Modify/Etc.)

III. **PROJECT MANUAL/SPECIFICATIONS**.:
(Delete/Change/Modify/Etc.)

IV. **INVITATION TO BID**: (Delete/Change/Modify/Etc.)

END OF ADDENDUM NO. _____

(Addendum may be bound into Project Manual, attached to front cover, faxed, mailed, emailed or delivered to bidders.)

Addendum No. _____
Page 1 of 1

Pleasure Driveway and Park District of Peoria, Illinois

Sample Agreement Between Owner and Contractor

This **AGREEMENT** for | NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION & WELLNESS CENTER |

is made as of the _____ day of _____ in the year of Two Thousand Twenty-One (2021)

Between the Owner: | PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, ILLINOIS
1125 W. LAKE AVENUE
PEORIA, IL 61614

And the Contractor: |

The Owner's Representative is: | PLANNING, DESIGN AND CONSTRUCTION DEPARTMENT
1314 N. PARK ROAD
PEORIA, IL 61604

The Architect or Engineer is: | APACE DESIGN ARCHITECTS & ENGINEERS
2112 E. WAR MEMORIAL DR.
PEORIA, IL 61614

The Owner and Contractor agree as follows:

I. THE CONTRACT DOCUMENTS. The Contract Documents consist of this AGREEMENT, the Plans/Drawings for the Project dated December 15, 2020, all sections of the Project Manual dated February 23, 2021, including but not limited to the Instructions and Supplementary Instructions to Bidders, the Bid Form, the General Conditions (1997 AIA Document A201) and Supplementary General Conditions, the General Requirements, the Specifications, and other documents as enumerated in Section 10 and Attachment #1 of this AGREEMENT**,** and including addenda issued prior to the execution of this AGREEMENT. The Contract Documents form the CONTRACT between the Owner and the Contractor. The CONTRACT represents the entire and integrated contract for the construction of the Work of the Project between the parties hereto and supersedes prior proposals, contracts, negotiations, or representations, either written or oral.

II. THE WORK OF THE CONTRACT. The Contractor shall execute the entire Work described in the Contract Documents, unless modified in Section XI of this AGREEMENT**.**

III. BASIS OF PAYMENT. The Work of the CONTRACT shall be performed on a lump sum basis.

IV. CONTRACT SUM. The Owner shall pay the Contractor the sum of

(and incorporates the acceptance of bid alternates as defined in sub-paragraph "A", below) for the Contractor's performance of the Work required by the Contract Documents, subject to modifications made by Owner approved Change Orders. If this CONTRACT calls for a unit price basis of payment, the contract sum stated above shall be adjusted by Change Order based upon multiplying the unit prices submitted by the Contractor on the Bid Form (and included herein as an Attachment to this CONTRACT) times (x) the actual quantities installed.

A. ACCEPTANCE OF ALTERNATES. The contract sum stated above is based on the acceptance of the following alternates, which are described in the Project Manual:

ITEM	ADD	DEDUCT

V. DATES OF COMMENCEMENT AND COMPLETION OF THE WORK. The Owner's Representative will issue a written Notice to Proceed with the Work of the Project after receiving the required Performance Bond, Labor and Material Payment Bond, and Certificate of Insurance (in proper form and providing the required coverages and amounts from a company [or companies] acceptable to the Owner, and naming the Owner as an Additional Insured), and any other pre-construction submittals required by the Contract Documents. The Contractor hereby acknowledges and agrees that failure to provide such submittals in a timely manner shall not be cause to adjust the date(s) for completion of the Work.

A. LIQUIDATED DAMAGES. Owner and Contractor recognize that time is of the essence of this CONTRACT and that Owner will suffer financial loss if the Contractor has not achieved Substantial Completion and Final Completion of the Work within the time specified below, plus any extensions thereof allowed in accordance with Article 8 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time.

B. SUBSTANTIAL COMPLETION. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as Liquidated Damages for delay (but not as a penalty), Contractor shall pay Owner Two Hundred and fifty dollars ($ 250.00) for each calendar day that expires after One hundred eighty-nine (189) calendar days from Notice of Award until Substantial Completion is attained. The work is tentatively scheduled to be awarded on March 25, 2021 and be at Substantial Completion by September 30, 2021. Actual on-site work not affecting the use of the pool area will be permitted to begin on July 1, 2021. Owner will drain pools on August 1, 2021. On-site work in the pool area will be permitted starting August 2, 2021.

C. FINAL COMPLETION. After Substantial Completion if Contractor shall neglect, refuse, or fail to complete the remaining Work necessary to achieve Final Completion within seven (7) calendar days or any proper extension thereof granted by Owner, Contractor shall pay Owner Two hundred and fifty dollars ($250.00) for each day that expires after the time specified.

VI. PROGRESS PAYMENTS, REDUCTION OF RETAINAGE AND FINAL PAYMENT.

A. Unless otherwise specified elsewhere in the Contract Documents, the Contractor may submit monthly applications for progress payments ("Application for Payment") to the Owner's Representative. Each Application for Payment must be certified by the Architect or Engineer (if applicable), or the Owner's Representative if an Architect or Engineer has not been engaged for construction phase services. An Application for Payment shall be for a period of no less than one calendar month ending on the last day of the month, unless otherwise approved in writing by the Owner's Representative. Application forms shall be subject to Owner's approval. Each Application for Payment shall be based upon the Schedule of Values submitted by the Contractor, in accordance with the Contract Documents. The Schedule of Values shall be approved by the Owner's Representative and the Architect or Engineer (if applicable) in advance of the Contractor's first Application for Payment and the approved schedule shall be used by the Contractor as the basis for submitting payment requests. The Owner's Representative and/or

Architect/Engineer's (if applicable) approval of the Schedule of Values shall not constitute a complete check for accuracy, and shall not relieve the Contractor from responsibility for errors of any sort.

B. An Application for Payment (certified by the Architect or Engineer, if applicable) shall be submitted to the Owner's Representative no later than the fifth (5th) day of the month following the period for which the application is being submitted. In such case, the Owner shall make the progress payment to the Contractor not later than the twentieth day of the next month. A progress payment request on an Application for Payment (certified by the Architect or Engineer, if applicable) received by the Owner's Representative after the fifth (5th) day of a month shall be made by the Owner not later than forty-five days after receipt by the Owner's Representative.

C. Based upon its review of the certified (by the Architect or Engineer, if applicable) Application for Payment, the Owner shall make a progress payment to the Contractor in such amount as the Owner reasonably determines is properly due, subject to a retainage of ten percent (10%) of the value of the Work completed and covered by the Application for Payment, less the aggregate of previous payments in each case. In determining the amount properly due, the Owner shall consider the value of labor, materials and equipment incorporated in the Work, or properly allocable to materials and equipment suitably stored at the site or at some other location previously agreed upon in writing by the parties. The Owner's Representative shall have the sole right to determine that materials or equipment stored off-site have been properly delivered, protected, and/or secured. The Owner's Representative (or the Architect or Engineer, if applicable) may nullify or withhold a Certificate of Payment, in whole or in part, for the reasons set forth in Section 9.5 of the General Conditions. Upon Substantial Completion of the Work, the Owner shall pay the Contractor a sum sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Owner's Representative shall determine for incomplete work and unsettled claims.

VII. Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner when **1)** the Contract has been fully performed by the Contractor except for the Contractor's responsibility to correct nonconforming Work as provided in Subparagraph 12.2.2 of the General Conditions and to satisfy other requirements, if any, which necessarily survive final payment; and **2)** a final Certificate of Payment has been issued by the Architect/Engineer or Owner's Representative; such final payment shall be made by the Owner not more than forty-five (45) days after the receipt of the final Certificate of Payment by the Owner.

VIII. CHANGE ORDERS. The Owner and Contractor agree that changes in the Work are sometimes required and necessary, and that timely: **a)** submission of proposed changes in the Work or the scope of Work by the Owner, **b)** pricing by the Contractor, **c)** review by the Owner's Representative and/or Architect/Engineer, and **d)** final approval by the Owner are necessary in order to assure that the Work of the Project is completed on schedule. The Contractor hereby acknowledges and agrees that an increase in the scope of the Work does not grant or imply an increase in the Contract Time, unless specifically so stated on the final approved Change Order. The Contractor also agrees that any and all Work which deviates from the plans and specifications and/or results in additional Work performed by Contractor's forces, including those of his sub-contractor's, will not result in additional expense to the Owner, unless **finally approved both by the Owner and the Architect/Engineer (if applicable) prior to the additional Work being performed.** No claim for an addition to the Contract Sum shall be valid unless approved by a written Change Order signed by the Owner and the architect/engineer (if applicable) **prior to the additional Work being performed.**

IX. TERMINATION OR SUSPENSION. The CONTRACT may be terminated by the Owner or the Contractor as provided by Article 14 of the General Conditions. The Work may be suspended by the Owner as provided in Article 14 of the General Conditions.

X. ENUMERATION OF CONTRACT DOCUMENTS. The Contract Documents, except for modifications issued after the execution of this Agreement, consist of:

- **A.** this Standard Form of Agreement Between Owner and Contractor, of the Pleasure Driveway and Park District of Peoria, Illinois.
- **B.** the Plans or Drawings titled Natatorium HVAC Replacement, RiverPlex Recreation & Wellness Center, dated December 15, 2020, and enumerated in ATTACHMENT #1 - "LIST OF DRAWINGS".
- **C.** Supplementary and other Conditions of the CONTRACT, and the Specifications, are those found in the Project Manual titled "Natatorium HVAC Replacement, RiverPlex Recreation & Wellness Center", and dated February 23, 2021 enumerated as follows:
  - **1)** Supplementary Instructions to Bidders
  - **2)** Contractor's Proposal, as accepted by the Owner
  - **3)** General Conditions of the Contract for Construction, AIA Document A201, 1997 Edition
  - **4)** Supplementary General Conditions
  - **5)** Major Subcontractor List
  - **6)** Directory of Minority & Women Owned Business Enterprises
  - **7)** Certification of Compliance for Listed Provisions and Laws
  - **8)** Peoria Park District Certificate of Equal Employment Opportunity Compliance for Contractors and Vendors
  - **9)** Workforce Profile
  - **10)** Minority/Women Owned Contact Sheet
  - **11)** Performance Bond
  - **12)** Labor and Material Payment Bond
  - **13)** Proof of Insurance
  - **14)** Specifications: Division 010000, "General Requirements"; Divisions 020000-350000 as applicable
  - **15)** Attachment A.6 - Insurance Requirements
  - **16)** Peoria Park District Weekly Workforce Report
  - **17)** Certified Payroll Form

XI. MISCELLANEOUS PROVISIONS. Other Provisions of this Agreement are as follows:

This AGREEMENT is entered into as of the day and year first written above and is executed in at least three original copies of which one is to be delivered to the Contractor, one to the Architect/Engineer (if any) for use in the administration of the CONTRACT, and one to the Owner.

OWNER:	**CONTRACTOR :**
_____	_____
(Signature)	(Signature)
ROBERT L. JOHNSON, SR., Park Board President	_____
	(Printed Name and Title)
ATTEST:	ATTEST:

ATTACHMENT #1 - LIST OF DRAWINGS

Number	Title	Date
G000	TITLE SHEET	12/15/20
S101	STRUCTURAL PLANS, DETAILS, AND NOTES	12/15/20
DH100	MAIN FLOOR HVAC DEMOLITION PLAN	12/15/20
DH101	UPPER FLOOR HVAC DEMOLITION PLAN	12/15/20
H100	MAIN LEVEL HVAC PLAN	12/15/20
H101	UPPER LEVEL HVAC PLAN	12/15/20
H102	ROOF LEVEL HVAC PLAN	12/15/20
H201	HVAC SCHEDULES AND DETAILS	12/15/20
H202	AIR DUCT DETAILS	12/15/20
H203	AHU AND COIL ELEVATIONS AND DETAILS	12/15/20
H204	HVAC SYSTEM DRAWING	12/15/20
ED101	2ND FLOOR ELECTRICAL DEMOLITION PLAN	12/15/20
E100	1ST FLOOR REVISED ELECTRICAL PLAN	12/15/20
E101	2ND FLOOR REVISED ELECTRICAL PLAN	12/15/20
E200	GENERAL ELECTRICAL NOTES AND SCHEDULES	12/15/20

PERFORMANCE BOND

TO: PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA
PEORIA, ILLINOIS

KNOW ALL MEN BY THESE PRESENTS;

That_____
_____
as Principal, and_____
_____as
corporation of the State of _____, as Surety, are held and firmly bound unto the PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, PEORIA, ILLINOIS, as Obligee, in the amount of _____
_____
($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 20 _____ entered into a contract with Obligee for _____
_____
in accordance with contract documents prepared by the Architect-Engineer, which Contract is by reference made a part hereof and is hereinafter referred to as "the Contract".

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Principal shall promptly and faithfully perform the Contract and all changes thereof, and during the life of any guaranty or warranty required under the Contract, and, if Principal shall fully secure and protect the Obligee from all liability and from all loss or expense of any kind, including all court costs, engineering fees and attorneys' fees made necessary or arising from the failure, refusal or neglect of Principal to comply with all obligations assumed by Principal in connection with the performance of the Contract and all changes thereof, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Surety hereby waives notice of any changes in the Contract, including extensions of time for the performance thereof. Whenever Principal shall be and is declared to be in default under the Contract, Obligee having performed Obligee's obligations thereunder, Surety shall, after notice of such default, reserve all rights against all parties, take over and complete the Contract and become entitled to payment of the balance of any monies due or to become due to such defined Principal in accordance with the progress of the work.

A condition of this Bond is that the Principal shall faithfully perform in accordance with the prevailing wage clause provided in the bid specification or Contract pursuant to Illinois Compiled Statutes 820 ILCS 130/1 *et. seq.*

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Obligee named herein.

Signed and Sealed this _____ day of _____, 20 _____.

CONTRACTOR

_____
Contractor Firm Name

By: _____
Signature

_____
Title

SURETY

_____
Surety Name

By:_____
Attorney-in-Fact

_____
Resident Agent

ATTEST:

_____
Corporate Secretary (Corporations only)

LABOR & MATERIAL PAYMENT BOND

TO: PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA
PEORIA, ILLINOIS

KNOW ALL MEN BY THESE PRESENTS:

That: _____
_____
as Principal, and _____
_____
a corporation of the State of _____ as Surety, are held and firmly bound unto the PLEASURE DRIVEWAY AND PARK DISTRICT OF PEORIA, PEORIA, ILLINOIS, as Obligee, for the use and benefit of claimants as hereinafter defined in the amount of _____Dollars ($_____), for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____, 20 _____, entered into a Contract with Obligee for _____
_____
in accordance with contract documents prepared by the Architect-Engineer which Contract is by reference made a part hereof, and is hereinafter referred to as "the Contract".

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if Principal shall promptly pay for all laborers, workers and mechanics engaged in the work under the Contract, and not less than the general prevailing rate of hourly wages of a similar character in the locality in which the work is performed, as determined by the State of Illinois Department of Labor pursuant to the Illinois Compiled Statutes 820 ILCS 130/1 et. seq. and for all material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect.

1. A claimant is defined as any person, firm, or corporation having contracts with the Principal or with any of Principal's subcontractors for labor or materials furnished in the performance of the Contract on account of which this Bond is given.

2. Nothing in this Bond contained shall be taken to make the Obligee liable to any subcontractor, materialman or laborer, or to any other person to any greater extent than it would have been liable prior to the enactment of The Public Construction Bond Act, approved June 20, 1931, as amended; provided further, that any person having a claim for labor and materials furnished in the performance of the Contract shall have no right of action unless he shall have filed a verified notice of such claim with the Obligee within 180 days after the date of the last item of work or the furnishing of the last item of materials, which claim shall have been verified and shall contain the name and address of the claimant, the business address of the claimant within the State of Illinois, if any, or if the claimant be a foreign corporation having no place of business within the State the principal place of business of the corporation, and in all cases of partnership the names and residences of each of the partners, the name of the Contractor for the Obligee, the name of the person, firm or corporation by whom the claimant was employed or to whom such claimant furnished materials, the amount of the claim and a brief description of the public improvement for the construction or installation of which the Contract is to be performed. No defect in the notice herein provided for shall deprive the claimant of its right of action under the terms and provisions of this Bond unless it shall affirmatively appear that such defect has prejudiced the rights of an interested party asserting the same.

3. No action shall be brought on this Bond until the expiration of 120 days after the date of the last item of work or of the furnishing of the last item of material except in cases where the final settlement between the Obligee and the Contractor shall have been made prior to the expiration of the 120 day period, in which case action may be taken immediately following such final settlement; nor shall any action of any kind be brought later than 6 months after the acceptance by the Obligee of the work. Such suit shall be brought only in the circuit court of this State in the judicial district in which the Contract is to be performed.

4. Surety hereby waives notice of any changes in the Contract, including extensions of time for the performance thereof.

5. The amount of this Bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

6. The Principal and Surety shall be liable for any attorneys fees, engineering costs, or court costs incurred by the Obligee relative to claims made against this Bond.

Signed and Sealed this _____ day of _____, 20 _____.

CONTRACTOR	**SURETY**
Contractor Firm Name:	
_____	_____
By: _____ Signature	By:_____ Attorney-in-Fact
_____ Title	_____ Resident Agent

ATTEST:

_____
Corporate Secretary (Corporations only)

CONTRACTOR'S AFFIDAVIT

STATE OF ILLINOIS)
) SS
COUNTY OF PEORIA)

TO WHOM IT MAY CONCERN:

THE undersigned, being duly sworn, deposes and says that he is _____ _____ of the _____ who is the contractor for the _____ building located at _____ owned by _____.

That the total amount of the contract including extras is $_____ on which he has received payment of $_____ prior to this payment. That all waivers are true, correct and genuine and delivered unconditionally and that there is no claim either legal or equitable to defeat the validity of said waivers. That the following are the names of all parties who have furnished material or labor, or both, for said work and all parties having contracts or sub-contracts for specific portions of said work or for material entering into the construction thereof and the amount due or to become due to each, and that the items mentioned include all labor and material required to complete said work according to plans and specifications:

NAMES	WHAT FOR	CONTRACT PRICE	AMOUNT PAID	THIS PMT.	BALANCE DUE

TOTAL ALL LABOR AND MATERIAL TO COMPLETE

There are no other contracts for said work outstanding, and that there is nothing due or to become due to any person for material, labor or other work of any kind done or to be done upon or in connection with said work other than above stated.

Signed this _____ day of _____, 20 _____.

Signature: _____

Subscribed and sworn to before me this _____ day of _____, 20 ___.

_____
Notary Public

FINAL WAIVER OF LIEN

STATE OF ILLINOIS)
) SS
COUNTY OF PEORIA)

TO WHOM IT MAY CONCERN:

WHEREAS, the undersigned _____ha_____ been employed by THE PEORIA PARK DISTRICT to furnish material and labor for the _____

at the premises commonly known as _____

located in the City of _____, County of Peoria, State of Illinois.

The undersigned, for and in consideration of _____ ($_____) Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged, do_____ hereby waive and release any and all lien or claim or right of lien under the statutes of the State of Illinois relating to mechanics' liens, with respect to and on said above-described premises and improvements thereon and on the money, funds or other considerations due or become due from the owner on account of labor or services, material, fixtures, apparatus or machinery heretofore furnished or which may be furnished at any time hereafter by the undersigned for the above described premises.

Dated this _____ day of _____ 20 _____.

[Affix corporate seal here.]

_____
(Name of sole owner, corporation or partnership)

ATTEST:

_____ _____(SEAL)
(Signature of secretary of corporation) (Signature of sole owner or authorized representative of corporation or partnership)

WAIVER OF LIEN

GENERAL CONTRACTOR'S PARTIAL
TO COVER ONLY CERTAIN PAYMENTS

STATE OF ILLINOIS)
) SS
COUNTY OF PEORIA)

TO ALL WHOM IT MAY CONCERN:

WHEREAS, the undersigned _____ has been employed by THE PEORIA PARK DISTRICT to furnish material and labor for the _____at the premises commonly known as _____

_____

located in the City of Peoria, County of Peoria, and State of Illinois.

NOW, THEREFORE, the undersigned, for and in consideration of the sum of _____ _____ Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged by the undersigned, does hereby waive and release to the extent only of the aforesaid amount of _____ Dollars, paid simultaneously herewith, any and all lien or right or claim of lien under the statutes of the State of Illinois relating to mechanics' liens, with respect to and on said above-described premises, and the improvements thereon and on the money, funds, or other consideration due or to become due from the owner on account of labor, services, material, fixtures, apparatus or machinery, furnished by the undersigned, to or on account of the said owner, for the above-described premises, but only to the extent of the payment aforesaid.

Dated this _____ day of _____, 20 _____.

[Affix corporate seal here]

_____
(Name of sole owner, corporation or partnership)

ATTEST:

_____ _____(SEAL)
(Signature of secretary of corporation) (Signature of sole owner or authorized representative of corporation or partnership)

SUB-CONTRACTOR'S FINAL WAIVER OF LIEN

STATE OF ILLINOIS)
) SS

COUNTY OF PEORIA)

TO WHOM IT MAY CONCERN:

WHEREAS, the undersigned _____
(sub-contractor)
ha____ been employed by _____
(general contractor)
to furnish material and labor for the _____ at the

premises commonly known as _____, in the City of _____,

County of Peoria, State of Illinois.

The undersigned, for and in consideration of _____

_____ ($_____) Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged, do _____ hereby waive and release any and all lien or claim or right of lien under the statutes of the State of Illinois relating to Mechanics Liens, on the above described premises and improvements thereon and on the money, funds or other considerations due or become due from the owner on account of labor or services, material, fixtures, apparatus or machinery heretofore furnished or which may be furnished at any time hereafter by the undersigned for the above described premises.

Dated this _____ day of _____, 20 _____.

[Affix corporate seal here.]

ATTEST:_____

_____
(Name of sole owner, corporation or partnership)

_____ _____(SEAL)
(Signature of sole owner or authorized representative of corporation of partnership)
(Signature of secretary of corporation)

WAIVER OF LIEN

SUB-CONTRACTOR'S PARTIAL
TO COVER ONLY CERTAIN PAYMENTS

STATE OF ILLINOIS)
) SS
COUNTY OF PEORIA)

TO WHOM IT MAY CONCERN:

THE undersigned, _____
(sub-contractor)
has been employed by _____
(general contractor)
to furnish material and labor for the _____

_____

at the premises commonly known as _____

_____
located in the City of Peoria, County of Peoria, and State of Illinois.

NOW, THEREFORE, the undersigned, for and in consideration of the sum of _____ _____ Dollars, and other good and valuable considerations, the receipt whereof is hereby acknowledged by the undersigned, does hereby waive and release to the extent only of the aforesaid amount of _____ Dollars, paid simultaneously herewith, any and all lien or right or claim of lien under the statutes of the State of Illinois relating to mechanics' liens, with respect to and on said above-described premises, and the improvements thereon and on the money, funds, or other consideration due or to become due from the owner on account of labor, services, material, fixtures, apparatus or machinery, furnished by the undersigned, but only to the extent of the payment aforesaid.

Dated this _____ day of _____, 20 _____.

[Affix corporate seal here.]

_____
(Name of sole owner, corporation or partnership)

ATTEST:

_____
(Signature of secretary of corporation)

_____(SEAL)
(Signature of sole owner or authorized representative of corporation or partnership)

PEORIA PARK DISTRICT
Weekly Workforce Report
Instructions

This weekly workforce report must be completed and returned to the Peoria Park District project manager for each week that you are working on Peoria Park District property. You are to report only those employees that are actually working on the Peoria Park District project identified on this report. Do not report employees that are not working on the project identified on this report.

If you have further questions regarding this report, please contact the Owner's Project Manager.

I. Trade and Hour Breakdown Table
- List the different trades (carpenter, laborer, plumber, etc.) and report the number of hours by race/gender for each trade;
- Total the hours for each trade on the right.

II. New Hires by Race and Gender
- If additional employees are hired for the job, please record the number of employees hired by race/gender.

III. Total Project Employee Breakdown
- Please track total hours by race/gender for the project if project lasts longer than a week.

Weekly Workforce Report (Peoria Park District Form) Date:_____ Week Ending: _____

Contractor/Subcontractor:_____ Project: _____

Trade & Hour Breakdown:

TRADE	FEMALE HOURS	CAUCASIAN HOURS	AFRICAN-AMERICAN HOURS	HISPANIC HOURS	NATIVE AMERICAN HOURS	ASIAN, PAC. ISLANDER HOURS	TOTAL HOURS

New Hires by Race & Gender

TRADE	CAUCASIAN	AFRICAN-AMERICAN	HISPANIC	NATIVE AMERICAN	ASIAN, PACIFIC ISLANDER	MALE	FEMALE

Total Project Employee Breakdown

	CAUCASIAN	AFRICAN-AMERICAN	HISPANIC	NATIVE AMERICAN	ASIAN, PACIFIC ISLANDER	MALE	FEMALE

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

► **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here **Signature of U.S. person** ► **Date** ►

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting,* later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the instructions for Part II for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code,* later, and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships,* earlier.

What is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code,* later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note: ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C corporation, or S corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box on line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3.

IF the entity/person on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation
• Individual • Sole proprietorship, or • Single-member limited liability company (LLC) owned by an individual and disregarded for U.S. federal tax purposes.	Individual/sole proprietor or single-member LLC
• LLC treated as a partnership for U.S. federal tax purposes, • LLC that has filed Form 8832 or 2553 to be taxed as a corporation, or • LLC that is disregarded as an entity separate from its owner but the owner is another LLC that is not disregarded for U.S. federal tax purposes.	Limited liability company and enter the appropriate tax classification. (P= Partnership; C= C corporation; or S= S corporation)
• Partnership	Partnership
• Trust/estate	Trust/estate

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, write NEW at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester,* later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.SSA.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/Businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. Go to *www.irs.gov/Forms* to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to *www.irs.gov/OrderForms* to place an order and have Form W-7 and/or SS-4 mailed to you within 10 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code,* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLE accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor[2]
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee[1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner[1]
6. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
7. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity[4]
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships,* earlier.

***Note:** The grantor also must provide a Form W-9 to trustee of trust.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at *spam@uce.gov* or report them at *www.ftc.gov/complaint.* You can contact the FTC at *www.ftc.gov/idtheft* or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see *www.IdentityTheft.gov* and Pub. 5027.

Visit *www.irs.gov/IdentityTheft* to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

A complete copy of AIA Document A201, 1997 Edition, with Supplementary General Conditions incorporated, is available for review in the Peoria Park District's Planning, Design and Construction Office.

SUPPLEMENTARY GENERAL CONDITIONS

1. A. "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION", AIA Document A201, 1997 Edition, published by the American Institute of Architects, including revisions adopted before the date of the Project Manual, is hereby made part of these Specifications with same force and effect as though set forth in full.

B. The following modifies, changes, deletes from or adds to the General Conditions of the Contract for Construction (AIA Document A201, Fourteenth Edition, 1997). Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

C. Parenthesis ( ) indicates the appropriate section and Subparagraph of the General Conditions which each paragraph of the Supplementary General Conditions modifies or refers to.

2. INSERT THE FOLLOWING PHRASE TO PARAGRAPH (1.1.1) AFTER THE WORDS "The Contract Documents consist of the Agreement Between Owner and Contractor (hereinafter the Agreement)":

"the Contractor's Bid, the Advertisement for Bids, the Instructions to Bidders, sample forms and addenda relating to these,"

DELETE THE LAST SENTENCE OF PARAGRAPH (1.1.1).

3. ADD THE FOLLOWING SENTENCES TO END OF PARAGRAPH (1.2.1):

The Contractor shall notify the Owner's Representative immediately if discrepancies are discovered. Full-size or large-scale details or drawings shall govern small-scale drawings that the former are intended to amplify. Dimensions from drawings shall not be determined by scale or rule. Where the Drawings and Specifications conflict with each other or with themselves, the Owner's Representative (in consultation with the Architect, if any) will decide which conflicting requirement governs. Should discrepancies or doubt occur, Contractor shall not proceed with the Work without clarification from the Owner. Contractor shall request clarification in a reasonable time to avoid delays and increases in the Contract Sum.

ADD THE FOLLOWING PARAGRAPHS TO SECTION (1.2):

1.2.4 If any item or material shown on the Drawings is omitted from the Specifications, or vice-versa (except when the Drawings and Specifications clearly exclude such omitted item), and when such item or material is clearly required to complete the detail shown or specified, the Contractor shall furnish and install such item or material of the type and quality established by the balance of the detail shown and specified at no increase to the Contract Sum.

1.2.5 Where a typical or representative detail is shown on the Drawings, this detail shall constitute the standard for workmanship and materials throughout those parts of the Work.

1.2.6 Any Summary of Work as outlined in the Specifications shall not be deemed to limit the work required by the Contract Documents. The Contractor and each Subcontractor shall be responsible for carefully examining all Drawings, including all details, plans, elevations, sections, schedules and diagrams for each particular type of work, and for coordinating the Work described in the Drawings, with the related Specifications. The Contractor shall also be responsible for determining the exact scope of work for each type of work per the Contract Documents and Contractor shall endeavor to check cross-references of work excluded from any division. The Contract Sum is deemed to be based on a complete installation. When additional details or instructions are clearly required to complete the work, the Contractor is deemed to have made an allowance in the Contract Sum for completion of such Work consistent with the local standard of care.

1.2.7 The Drawings are intended to show the arrangement, design and extent of the Work and are schematic in nature. They are not to be scaled for roughing-in measurements or used as shop drawings.

4. ADD THE FOLLOWING PARAGRAPH TO SECTION (1.5):

1.5.3 Neither any oral representation by or oral agreement with any officer, agent, or employee of Owner or Architect before execution of this Contract shall affect or modify any of the Contractor's rights or obligations hereunder. Contractor is not aware of any facts that make misleading or inaccurate in any material respect any information Owner or Architect has furnished to Contractor which would have a material adverse affect on the Contract Time or Contract Sum which Contractor has not advised Owner or Architect of, and if, during the course of the performance of the Work, Contractor learns of any such facts it will so advise Owner. Contractor shall not be entitled to any adjustments in the Contract Time or the Contract Sum as a consequence of Contractor's breach of the terms of this Subparagraph.

5. IN PARAGRAPH (1.6.1) DELETE THE WORD "Architect**" IN THE FOURTH SENTENCE AND REPLACE IT WITH THE WORD "**Owner**".**

DELETE SENTENCES #7, #8, #9 STARTING WITH "The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are …."

6. DELETE PARAGRAPH (2.2.3) IN ITS ENTIRETY.

7. ADD THE FOLLOWING SENTENCE AT THE END OF PARAGRAPH (2.3.1):

"The Owner shall not be liable for any extra cost incurred by the Contractor by such an order."

8. IN PARAGRAPH (2.4.1) DELETE THE SECOND TO LAST SENTENCE.

9. IN PARAGRAPH (3.2.1, 3.2.2 AND 3.2.3) AFTER THE WORD "Architect**" ADD THE WORDS "**and Owner**".**

10. ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.2):

3.2.4 Before starting any work, the Contractor shall examine work performed by others to which his work adjoins or is applied to and report to the Owner's Representative any conditions that will prevent the satisfactory accomplishment of his work. Failure to notify the Owner's Representative of deficiencies or faults in preceding work prior to commencing work shall constitute acceptance thereof and waiver of any claim of its unsuitability.

11. ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.4):

3.4.4 Before ordering any material or doing any Work, the Contractor shall verify all measurements at the Project site and he shall be responsible for the correctness of same. No extra charge or compensation will be allowed to the Contractor on account of any difference between actual dimensions and the measurements shown on the Project Drawings.

3.4.5 The Contractor shall carefully inspect all materials delivered on and to the Project site and reject defective materials without waiting for the Owner's Representative or other representative of Owner to observe the materials.

12. ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.5):

3.5.2 The Contractor agrees to assign to the Owner any and all manufacturer's warranties relating to materials and equipment furnished as part of the Work and further agrees to perform the Work in such manner so as to preserve any and all such manufacturer's warranties subject to installation directives and other terms of the Contract Documents. The Contractor agrees to deliver to the Owner, upon final payment, such assignments along with or as part of a reference manual, in form and detail reasonably acceptable to Owner, showing all such warranties and guarantees provided by the Contractor and Subcontractors. Such warranties and guarantees shall commence no sooner than the date of purchase from the supplier.

3.5.3 The warranty of Contractor provided in Paragraph 3.5 shall in no way limit or abridge the warranties of the suppliers of equipment and systems which are to comprise a portion of the Work, if they are broader, and all of such warranties shall be in form and substance as required by the Contract Documents. Contractor shall take no action or fail to act in any way which results in the termination or expiration of such third party warranties or which otherwise results in prejudice to the rights of the Owner under such warranties subject to installation directives and other terms of the Contract Documents. Contractor agrees to provide all notices required for the effectiveness of such warranties and shall include provisions in the contracts with the providers and manufacturers of such systems and equipment whereby Owner shall have a direct right of enforcement of such warranty obligations.

13. IN PARAGRAPH (3.6.1), DELETE THE WORD "Sales".

ADD THE FOLLOWING AT THE END OF PARAGRAPH (3.6.1):

The Peoria Park District is exempt from Federal, State and Local taxes. A certificate of exemption will be furnished upon request.

14. IN PARAGRAPH (3.10.2) BEFORE THE WORD "Architect's" **ADD THE WORDS** "Owner's and".

IN PARAGRAPH (3.10.2) AFTER THE WORD "Architect" **ADD THE WORDS** "and Owner's Representative".

ADD THE FOLLOWING PARAGRAPHS TO SECTION (3.10):

3.10.4 The construction schedule shall provide for the most expeditious and practicable execution of the Work. The Contractor shall also work closely with the Owner to confirm that the construction schedule accurately reflects the status of the Project. The Contractor's construction schedule shall be updated every month by the Contractor and submitted to the Owner.

.1 Whenever it becomes apparent from the updated construction schedule that any substantial completion previously established by the construction schedule cannot be met, the Contractor shall, at the Owner's request, take any or all of the following actions with no increase to the Contract Sum or Contract Time (unless the delay is caused by an event set forth in paragraph 8.3 of these General Conditions thereby permitting adjustment of the Contract Sum and/or Contract Time under Paragraph 4.3.5 of these General Conditions):

.1.1 Increase construction manpower to substantially return the Project to schedule;

.1.2 Increase the number of working hours per shift, shifts per day or the amount of construction equipment or any combination of the foregoing which will substantially return the Project to schedule;

.1.3 Reschedule activities to concurrently accomplish activities, to the maximum degree practicable, in the time required by the Contract Documents.

If the Contractor fails to take any of these actions Owner shall have the notice and other rights set forth in Paragraph 2.4.

15. IN PARAGRAPH (4.1.1) DELETE THE FIRST SENTENCE AND SUBSTITUTE THE FOLLOWING:

"The Architect, Owner's Representative, and Owner's Project Manager are defined in Paragraph C of "Section 01000 - General" of "Division 01000 - General Requirements".

16. IN PARAGRAPH (4.2.1) DELETE THE WORDS "and will be an Owner's Representative**".**

17. IN PARAGRAPH (4.2.2) DELETE THE WORDS "as a representative of the Owner".

18. IN PARAGRAPH (4.2.4) IN THE FIRST SENTENCE SUBSTITUTE THE WORD "Architect" **FOR THE WORD** "Owner" **AND SUBSTITUTE THE WORD** "Owner" **FOR THE WORD** "Architect"**.**

19. IN PARAGRAPH (4.2.5) DELETE THE WORD "Architect's" **AND** "Architect"**AND SUBSTITUTE THE WORDS** "Owner Representative's" **AND** "Owner Representative"**.**

20. IN PARAGRAPH (4.2.6) IN THE SECOND SENTENCE AFTER THE WORDS "will have authority" **INSERT THE WORDS** "upon written authorization from the Owner".

21. IN PARAGRAPH (4.2.8) DELETE THE WORD "prepare" **AND SUBSTITUTE THE WORDS** "assist the Owner's Representative in preparing".

22. IN PARAGRAPH (4.2.9) DELETE THE WORD "Architect" **AND SUBSTITUTE WORDS** "Owner's Representative, assisted by the Architect".

23. IN PARAGRAPH (4.2.11) IN THE FIRST SENTENCE DELETE THE WORDS "and decide".

24. IN PARAGRAPH (4.2.12) IN THE FIRST SENTENCE DELETE THE WORD "and decisions".

IN PARAGRAPH (4.2.12) IN THE SECOND SENTENCE DELETE THE WORDS "and initial decisions" **AND** "or decisions".

25. ADD PARAGRAPH TO SECTION (4.2):

4.2.14 Notwithstanding any other provision of this Agreement to the contrary, the Architect shall have no authority to order or approve any material deviation from the Contract Documents, whether or not such deviation affects the Contract Sum or other Substantial Completion Date (as defined herein). In the event any such deviation is sought, prior written approval from the Owner's Representative and the Owner must be obtained. The Architect may decide quality issues and may approve non-material deviations from the Contract Documents.

26. IN PARAGRAPH (4.3.4) IN THE FOURTH SENTENCE DELETE THE WORD "decision" **AND SUBSTITUTE THE WORD** "recommendation".

IN PARAGRAPH (4.3.4) IN THE LAST SENTENCE DELETE THE WORD "determination" **AND SUBSTITUTE THE WORD** "recommendation".

27. DELETE PARAGRAPH (4.3.10) IN ITS ENTIRETY.

28. DELETE PARAGRAPH (4.4.1) AND SUBSTITUTE THE FOLLOWING:

"Claims, disputes and other matters in question between the Contractor and the Owner relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be initially referred in writing to the Architect for a recommendation."

29. IN PARAGRAPH (4.4.2) AFTER "(2)" ADD THE WORD "recommend" **AND CHANGE THE WORD** "reject" **TO** "rejecting".

IN PARAGRAPH (4.4.2) AFTER "(3)" ADD THE WORD "recommend" **AND CHANGE THE WORD** "approve" **TO** "approving".

IN PARAGRAPH (4.4.2) AT THE END OF THE SENTENCE DELETE THE WORD "resolve" **AND ADD THE WORDS** "make recommendation on".

30. IN PARAGRAPH (4.4.3) DELETE THE WORD "decision" **AND SUBSTITUTE THE WORD** "recommendation".

31. IN PARAGRAPH (4.4.4) IN THE LAST SENTENCE DELETE THE WORDS "either reject or approve the Claim" **AND SUBSTITUTE THE WORDS** "provide a recommendation regarding the Claim in accordance with Paragraph 4.2.2".

IN PARAGRAPH (4.4.4) AT THE END OF THE LAST SENTENCE DELETE THE WORDS "in whole or in part."

32. DELETE PARAGRAPHS (4.4.5) AND (4.4.6) IN THEIR ENTIRETY.

33. IN PARAGRAPH (4.4.8) DELETE THE WORD "resolution" **AND SUBSTITUTE THE WORDS** "final recommendation".

IN PARAGRAPH (4.4.8) AFTER THE WORD "Architect," **ADD THE WORD** "or".

IN PARAGRAPH (4.4.8) AT THE END OF THE SENTENCE DELETE THE WORDS "or by arbitration".

34. IN PARAGRAPH (4.5.1) DELETE THE WORD "decision" **AND SUBSTITUTE THE WORD** "recommendation".

IN PARAGRAPH (4.5.1) DELETE THE WORDS "arbitration or".

35. IN PARAGRAPH (4.5.2) IN THE SECOND SENTENCE DELETE THE WORDS "a demand for arbitration" **AND SUBSTITUTE THE WORDS** "legal or equitable proceedings".

IN PARAGRAPH (4.5.2) AFTER THE WORDS "proceed in advance of " **DELETE THE WORDS** "arbitration or".

36. IN PARAGRAPH (4.5.3) DELETE THE FIRST SENTENCE.

37. DELETE SECTION (4.6) IN ITS ENTIRETY.

38. IN PARAGRAPH (5.2.1) DELETE THE FIRST SENTENCE AND SUBSTITUTE:

> "The subcontractors/suppliers listed by the Contractor on the Major Subcontractor/Supplier List (submitted with the Bid) shall not be changed without the written consent of the Owner."

IN PARAGRAPH (5.2.1) IN THE SECOND SENTENCE DELETE THE WORDS "Architect will" **AND SUBSTITUTE THE WORDS** "Owner's Representative will".

IN PARAGRAPH (5.2.1) IN THE SECOND SENTENCE AFTER THE WORDS "promptly reply to" **ADD THE WORDS** "any request made by".

IN PARAGRAPH (5.2.1) IN THE SECOND SENTENCE AFTER THE WORDS "any such proposed" **ADD THE WORDS** "change in".

IN PARAGRAPH (5.2.1) IN THE LAST SENTENCE DELETE THE WORDS "Owner or Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

IN PARAGRAPH (5.2.1) IN THE LAST SENTENCE DELETE THE WORD "promptly" **AND ADD THE WORDS** "within 10 calendar days (of receipt of written request for such change from the Contractor)".

39. IN PARAGRAPH (6.2.2) BEFORE THE WORD "Architect" **ADD THE WORDS** "Owner and".

40. IN PARAGRAPH (6.3.1) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORD** "Owner".

41. IN PARAGRAPH (7.2.1) DELETE THE WORDS "the Architect" **AND SUBSTITUTE THE WORDS** "the Owner's Representative".

ADD THE FOLLOWING PARAGRAPHS TO SECTION (7.2):

> **7.2.3** A Change Order shall include all of the Contractor's costs associated therewith.

7.2.4 The Contractor shall not accept any request for a Change Order from any person other than the Owner and may not perform any work asserted to constitute a change in the Work until the Owner has approved the Change Order in writing, unless the Owner authorizes the Contractor, in writing, to proceed with a change prior to the Owner's final approval. Notwithstanding anything to the contrary herein, the Contractor shall not charge for overtime services in the performance of any Change Order Work, unless the Owner has specifically authorized overtime in writing. Owner may competitively bid changes in the Work and Contractor, Subcontractor and suppliers shall provide Owner with all documents Owner requests to facilitate such competitive bidding of changes in the Work.

7.2.5 There shall be no change in the Work, whether an alteration or addition to the Contract Sum or to any amounts due under the Contract Documents or to a change in the Contract Time, unless and until such alteration or addition has been authorized by a written Change Order executed and issued in accordance and compliance with the requirements with this Article 7 or by written authorization to proceed with such change in the Work signed by the Owner or as otherwise provided pursuant to the Contract Documents. The requirements set forth in this Paragraph 7.2.5 are of the essence. No claim that the Owner has been unjustly enriched by any alteration or addition to the Work, whether or not any such unjust enrichment to the Work or to the Owner in fact exists, shall form the basis of any claim for an increase in any amount due under the Contract Documents or a change in the Contract Time, and the terms of a fully-executed Change Order shall be conclusive.

42. IN PARAGRAPH (7.3.1) DELETE THE WORDS "the Architect" **AND SUBSTITUTE THE WORDS** "the Owner's Representative".

43. IN PARAGRAPH (7.3.4) DELETE THE WORDS "the Architect" **AND SUBSTITUTE THE WORDS** "the Owner's Representative".

44. IN PARAGRAPH (7.3.6) IN THE FIRST SENTENCE DELETE THE WORD "determined" **AND SUBSTITUTE THE WORD** "recommended".

45. IN PARAGRAPH (7.3.7) IN THE FIRST SENTENCE AFTER THE WORD "Architect" **ADD THE WORDS** "and the Owner's Representative".

46. IN PARAGRAPH (7.3.8) DELETE THE WORDS "the Architect" **AND SUBSTITUTE THE WORDS** "the Owner's Representative".

47. IN PARAGRAPH (7.3.9) DELETE THE WORD "determination" **AND SUBSTITUTE THE WORD** "recommendation".

48. IN PARAGRAPH (8.1.3) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

49. ADD THE FOLLOWING PARAGRAPHS TO SECTION (8.2) .

8.2.4 All work shall be "Substantially Complete" as required by the **Instructions to Bidders** and the **Agreement Between Owner and Contractor.**

8.2.5 It is further agreed that said completion schedule is reasonable, and the Contractor shall prosecute said work regularly, diligently and continuously at such rate of progress as will insure full completion thereof within the time specified.

8.2.6 Provided, however, the following exceptions:

.1 Any preference, priority or allocation order duly issued by the United States Government.

.2 Any unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including acts of God, or of a public enemy, acts of the Owner, acts of another Contractor in performance of a separate contract with the Owner, fire, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather. The criteria on which the unusually severe weather shall be based is the average precipitation/temperatures received in the project area, as recorded over a period of the last five (5) years at the local area United States Weather Station. Any extension of time due to unusually severe weather must be requested by the Contractor on the basis of documented records of the actual precipitation/temperatures during the contract time period, compared with the normal/average for the area. Also, the criteria shall include the number of excessive precipitation or extreme cold days (i.e., days in which the temperature would adversely affect the type of work being constructed) over the same period and whether or not the Contractor's force worked on said days or stage of construction was affected.

.3 Any delays of subcontractors occasioned by any of the causes specified in this paragraph.

8.2.7 Provided further that the Contractor shall, within seven (7) days from the beginning of any such delay during the performance of the Contract, notify the Owner's Representative in writing of the alleged cause of such delay.

50. IN PARAGRAPH (8.3.1) DELETE THE WORDS "and arbitration".

IN PARAGRAPH (8.3.1) DELETE THE WORD "determine" **AND SUBSTITUTE THE WORD** "recommend".

51. DELETE PARAGRAPH (9.2.1) AND SUBSTITUTE THE FOLLOWING:

"Before the first Application for Payment, the Contractor shall submit to the Owner's Representative a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect and Owner's Representative may require. This schedule, unless objected to by the Architect and Owner's Representative, shall be used as a basis for reviewing the Contractor's Applications for Payment."

52. IN THE FIRST SENTENCE OF (9.3.1), CHANGE "ten" **TO** "forty five".

IN PARAGRAPH (9.3.1) IN THE FIRST SENTENCE DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

ADD THE FOLLOWING TO THE END OF PARAGRAPH (9.3.1):

Payment requests shall consist of AIA Documents #702 "Application and Certificate for Payment"; AIA #703 "Continuation Sheet"; Contractors Affidavit of Payment to Subcontractors and Suppliers; Weekly Workforce Reports; Certified Payroll Form; and Waivers of Lien. (Waivers of Lien are required from the general contractor in the full amount of the current payment application, and from all subcontractors, suppliers, or workers who provide more than $10,000 of project material/labor of the Work. The waiver shall be in the amount(s) listed in the Contractor's Affidavit.) For final payment, the general contractor shall also provide a Waiver of Lien in the full amount of the contract price.

The Waiver of Lien and Contractor Affidavit forms used shall be the Peoria Park District's standard form(s): 1) "Final Waiver of Lien" (for general contractors), 2) "Waiver of Lien - General

Contractor's Partial To Cover Only Certain Payments", 3) "Sub-Contractor's Final Waiver of Lien", 4) "Waiver of Lien - Sub-Contractor's Partial To Cover Only Certain Payments, and 5) "Contractor's Affidavit". (These forms are included in the Project Manual, and are the required Waiver of Lien forms for the project.)

(If the Contractor is unable to provide the required sub-contractor waiver at the time the application for payment is submitted (preferred method) alternatively, it may be provided at the time that payment is delivered by the District. If the sub-contractor waiver(s) still cannot be provided at that time, the District will provide "two-party" checks in which the Contractor and the sub-contractor are named jointly as payees.)

Format of AIA #703 shall follow that of "Schedule of Values". (See Division 01000 Article IV.) All payment requests shall reflect retainage in the amount of 10% of completed work.

53. IN PARAGRAPH (9.3.1.1) DELETE THE WORDS "or by interim determination of the Architect, but not yet included in Change Orders".

54. ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (9.3.1):

9.3.1.3 Upon Substantial Completion, the Owner will pay 95% percent of the amount due to the Contractor on account.

9.3.1.4 Monthly progress payments will be made by the Owner on projects lasting more than sixty days (from award of the bid to the Substantial Completion date given in the Supplementary Instructions to Bidders).

55. ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (9.3.2):

9.3.2.1 Material stored on site will be considered for payment only when a Schedule of Stored Materials with appropriate values accompany the payment request as an attachment.

9.3.2.2 All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of material and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the contract.

56. IN PARAGRAPH (9.4.1) DELETE THE WORDS "Architect" **AND** "Architect's" **AND SUBSTITUTE THE WORDS "**Owner's Representative" **AND** "Owner's Representative's".

IN PARAGRAPH (9.4.1) DELETE THE PHRASE "with a copy to the Contractor".

57. IN THE FIRST SENTENCE OF PARAGRAPH (9.4.2) DELETE THE WORD "Architect".

IN THE FIRST SENTENCE OF PARAGRAPH (9.4.2) AFTER THE WORDS "Architect's" **ADD THE WORDS** "and Owner's Representative's".

IN THE FOURTH SENTENCE OF PARAGRAPH (9.4.2) DELETE THE WORDS "Architect has" **AND SUBSTITUTE THE WORDS** "Owner's Representative and Architect have".

58. IN PARAGRAPH (9.5.1) DELETE THE WORDS "Architect" **AND** "Architect's" **AND SUBSTITUTE THE WORDS** "Owner's Representative **AND** "Owner's Representative's".

59. IN PARAGRAPHS (9.6.1, 9.6.3, AND 9.6.4) DELETE THE WORDS "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

60. IN PARAGRAPH (9.7.1) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

IN PARAGRAPH (9.7.1) DELETE THE WORDS "or awarded by arbitration".

61. IN PARAGRAPH (9.8.2) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS "**Owner's Representative".

62. IN THE FIRST SENTENCE OF PARAGRAPH (9.8.3) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative assisted by the Architect".

IN THE SECOND AND THIRD SENTENCES OF PARAGRAPH (9.8.3) DELETE THE WORDS "Architect's" and "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative's" and "Owner's Representative".

63. IN PARAGRAPH (9.8.4) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

64. IN PARAGRAPH (9.9.1) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

65. IN PARAGRAPH (9.10.1) IN THE FIRST SENTENCE AFTER THE FIRST TWO APPEARANCES OF THE WORD 'Architect" **ADD THE WORDS** "and Owner's Representative".

IN PARAGRAPH (9.10.1) DELETE THE THIRD AND FOURTH APPEARANCES OF THE WORD "Architect" and "Architect's" **AND SUBSTITUTE THE WORDS** "Owner's Representative" and "Owner's Representative's".

IN PARAGRAPH (9.10.1) AFTER THE FIFTH APPEARANCE OF THE WORD "Architect's" **ADD THE WORDS** "and Owner's Representative's".

IN THE LAST SENTENCE OF PARAGRAPH (9.10.1) DELETE THE WORD "Architect's" **AND SUBSTITUTE THE WORDS** "Owner's Representative's".

66. IN PARAGRAPH (9.10.2) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORD** "Owner's Representative".

67. ADD THE FOLLOWING SUB-PARAGRAPH TO PARAGRAPH (9.10.2):

9.10.2.1 When all items including items noted within Division 1000 General Requirements are found to be complete and in conformance with the Contract Documents, a final payment will be issued.

68. IN PARAGRAPH (9.10.3) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

69. IN PARAGRAPH (11.1.1) IN THE FIRST SENTENCE AFTER THE PHRASE "as will protect the Contractor" **ADD THE WORDS** "Architect and Owner".

70. IN PARAGRAPH (11.1.2), IN THE FIRST SENTENCE DELETE THE WORDS "limits of liability specified in the Contract Documents" **AND SUBSTITUTE THE WORDS** "limits required in 'Attachment A – Project Specific Insurance Requirements' (which is included as the last section of the Project Manual and the requirements therein shall be made part of the Contract Documents),".

IN PARAGRAPH (11.1.2) AFTER THE FIRST SENTENCE ADD:

"In addition, if any of the work occurs within fifty feet of an active railroad line and the Contractor's general liability coverages provide for exclusions of coverage when working on or near a railroad, the Contractor shall provide a separate Railroad Protective Liability Insurance Policy naming the railroad as the insured party, with the coverage limits required by that railroad."

71. IN PARAGRAPH (11.1.3), AFTER THE WORDS "Certificates of insurance" **ADD THE WORDS** "and endorsements to the insurance policy(s) which are".

IN PARAGRAPH (11.1.3) AFTER THE WORDS "acceptable to the Owner" **ADD THE WORDS** "and naming the Owner, their agents and consultants as additional insured".

ADD THE FOLLOWING SUB-PARAGRAPHS TO PARAGRAPH (11.1)

11.1.4 The Contractor may, at his option, furnish Owner's Protective Liability Insurance in lieu of naming the Owner Additional Insured on the Contractor's policy, as required above. This insurance shall protect the Owner from claims as set forth in Paragraph 11.1.1 of the General Conditions, and to the limits required herein, as shown in "Attachment A".

11.1.5 The Contractor shall furnish two copies of each of the required Certificates or Endorsements for each copy of the Agreement which shall specifically set forth evidence of all coverage required by the Contract Documents. The form of the Certificate(s) or Endorsement(s) shall be those as required in "Attachment A". The Contractor shall also furnish to the Owner copies of any endorsements which limit coverage, or are subsequently issued amending coverage or limits of coverage.

72. DELETE PARAGRAPHS (11.3.1, 11.3.2, AND 11.3.3) IN THEIR ENTIRETY.

73. DELETE PARAGRAPH (11.4.1) AND SUBSTITUTE:

"If the work of the project is being completed by one general or prime contractor rather than multiple prime contractors, the Contractor shall purchase and maintain property insurance upon the entire Work at the site to the full replacement value thereof. Such insurance shall be in a company or companies against which the Owner has no reasonable objection. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work.

74. AT THE END OF PARAGRAPH (11.4.1.1) ADD THE FOLLOWING SENTENCE: "The form of policy for this coverage shall be "Completed Value".

75. DELETE PARAGRAPH (11.4.1.2) IN ITS ENTIRETY.

76. DELETE PARAGRAPH (11.4.1.3) IN ITS ENTIRETY AND SUBSTITUTE:

"If by the terms of this insurance any mandatory deductibles are required, or if the Contractor should elect, with the concurrence of the Owner, to increase the mandatory deductible amounts or purchase this insurance with voluntary deductible amounts, the Contractor shall be responsible for payment of the amount of all deductibles in the event of a paid claim. If separate contractors are added as insureds to be covered by this policy, the separate contractors shall be responsible for payment of appropriate part of any deductibles in the event claims are paid on their part of the Project."

77. DELETE PARAGRAPHS (11.4.3, 11.4.4, AND 11.4.5) IN THEIR ENTIRETY.

78. DELETE PARAGRAPH (11.4.6) AND SUBSTITUTE:

"The Contractor shall file two certified copies of all policies with the Owner before exposure to loss can occur. If the Owner is damaged by the failure of the Contractor to maintain such insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto.

79. DELETE PARAGRAPHS (11.4.7, 11.4.8, 11.4.9, AND 11.4.10) IN THEIR ENTIRETY.

80. DELETE PARAGRAPH (11.5.1) AND SUBSTITUTE:

"The Contractor shall furnish a Performance Bond and a separate Labor and Material Payment Bond, each for one hundred percent (100%) of the Contract Sum. Form of these bonds shall be as provided by the Owner in the Project Manual and no other form will be accepted. The Surety shall be authorized to do business in the State of Illinois and be acceptable to the Owner.

81. IN PARAGRAPH (12.1.1) DELETE THE WORD "Architect's" **AND SUBSTITUTE WORDS** "Owner's Representative's and Architect's". **DELETE THE WORD** "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

82. IN PARAGRAPH (12.1.2) AFTER THE WORD "Architect" **ADD THE WORDS** "and Owner's Representative".

83. IN PARAGRAPH (12.2.1.1) AFTER THE WORD "Architect" **ADD THE WORDS** "and Owner's Representative".

84. IN PARAGRAPH (13.5.4) AFTER THE WORD "Architect" **ADD THE WORDS** "and Owner's Representative".

85. IN PARAGRAPH (14.1.1.3) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

86. IN PARAGRAPH (14.2.2) DELETE THE PHRASE ", upon certification by the Architect that sufficient cause exists to justify such action,".

87. IN PARAGRAPH (14.2.4) DELETE THE WORD "Architect" **AND SUBSTITUTE THE WORDS** "Owner's Representative".

88. DELETE PARAGRAPH (14.4.3) IN ITS ENTIRETY AND SUBSTITUTE:

In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination. In no event, however, will such amounts exceed the Contract Sum reduced by the amount of prior payments except for increases pursuant to the claims procedure in the Contract Documents. Subcontracts, subsubcontracts, and purchase orders will contain appropriate provisions for termination for convenience under this Paragraph 14.4.

89. ADD THE FOLLOWING ARTICLE 15: LABOR, SAFETY AND WAGE STANDARDS TO THE GENERAL CONDITIONS OF THE CONTRACT:

ARTICLE 15
LABOR, WAGE, SAFETY, AND OTHER STANDARDS

15.1 LABOR STANDARDS. All employers shall comply with the Employment of Illinois Workers on Public Works Act [30 ILCS 570/1 to 570/7].

15.2 WAGE STANDARDS.

15.2.1 PREVAILING WAGE ACT: Wages and benefits to employees shall comply with all Federal and State of Illinois statutes pertaining to public works projects and specifically: Wages of Employees on Public Works [820 ILCS 130/1 - 12].

15.2.2 Not less than the prevailing rate of wages as determined by the Park District or the Department of Labor shall be paid to all laborers, workers and mechanics performing work under this contract. All contractor's bonds shall include a provision as will guarantee the faithful performance of such prevailing wage clause as provided by this bid specification or contract.

15.2.3 The terms "general prevailing rate of hourly wages", "general prevailing rate of wages" or "prevailing rate of wages" when used in this Act mean the hourly cash wages plus fringe benefits for training and apprenticeship programs approved by the U.S. Department of Labor, Bureau of Apprenticeship and Training, health and welfare, insurance, vacations and pensions paid generally, in the locality in which the work is being performed, to employees engaged in work of a similar character on public works.

15.2.4 PREVAILING WAGE ACT/FOIA
Contractors and subcontractors shall submit proof to the Park District of certified payroll submission to the Illinois Department of Labor on a monthly basis in compliance with the Illinois Prevailing Wage Act. These records will be kept by the Park District for three years and may be reviewed by others through the Freedom of Information Act (FOIA). The Park District will exclude employee's address, telephone number, and social security number from public inspection.

15.3 SAFETY STANDARDS.

15.3.1 PROTECTION OF PERSONS AND PROPERTY: The Contractor and his subcontractors shall, at all times, comply with applicable provisions of Federal, State and Local laws.

15.3.1.1 The Contractor and his sub-contractors shall have written programs complying with Occupational Safety and Health Administration standards and/or Illinois Department of Labor requirements including, but not limited to the following: hazardous communications, hearing conservation, respirator use, confined space entry, scaffolding,

ladders, ventilation, flammable and combustible liquids, and lockout/tagout. The Contractor shall submit documentation of their programs at the request of the Owner's Representative, or Occupational Safety and Health Administration and/or Illinois Department of Labor officials.

15.4 EQUAL EMPLOYMENT OPPORTUNITY/AFFIRMATIVE ACTION/SEXUAL HARASSMENT

15.4.1 During the performance of the contract, the contractor agrees to the following:

15.4.1.1 That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are under-utilized and will take appropriate affirmative action to rectify any such under-utilization.

15.4.1.2 That, if it hires additional employees in order to perform his contract or any portion thereof, it will determine the availability (in accordance with the Rules and Regulations of the Illinois Department of Human Rights) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not under-utilized.

15.4.1.3 That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability or an unfavorable discharge from military service.

15.4.1.4 That it will have a written sexual harassment policy to include at the minimum, the following:

15.4.1.4.1 a definition of sexual harassment under the law;

15.4.1.4.2 a description of sexual harassment utilizing examples;

15.4.1.4.3 a formalized complaint procedure;

15.4.1.4.4 a statement of victim's rights;

15.4.1.4.5 directions on how to contact the Illinois Department of Human Rights. Out-of-state companies must provide directions for filing with the enforcement agency within their state. Companies that issue a standard policy for all business locations must prepare an addendum providing directions on how to contact the appropriate enforcement agency; and

15.4.1.4.6 A recitation that there cannot be any retaliation against employees who elect to file charges.

15.4.1.4.7 In addition, it is recommended that the employer post a copy of the sexual harassment policy in a prominent and accessible location and distribute it in a manner to assure notice to all employees on an annual basis.

15.4.1.4.8 The Illinois Human Rights Act specifically provides that all documents may meet, but cannot exceed, the sixth grade literacy level. Therefore, the employers sexual harassment policy must be stated in plain language and in "laymen's terms".

15.4.1.5 That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the contractor's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the contractor in its efforts to comply with such Act and Rules and Regulations, the contractor will promptly so notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.

15.4.1.6. That it will submit reports as required by the Department's Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.

15.4.1.7. That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.

15.4.1.8. That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as with other provisions of this contract, the contractor will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the contractor will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations.

15.4.2 In the event of the contractor's non-compliance with the provisions of the Illinois Human Rights Act, the contractor may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporation, and the contract may be cancelled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulations.

END OF SUPPLEMENTARY GENERAL CONDITIONS

SECTION 010000 - GENERAL

A. SUMMARY OF THE WORK

1. The Work covered under this Contract consists of that work described by the Invitation to Bid, the Instructions/Supplemental Instructions to Bidders, the Bid/Proposal Form, the General/Supplemental Conditions of the Contract, these General Requirements, the Plans, and the Technical Specifications.
2. The Contractor shall be responsible for all items incidental to the scope of the Work intended by the bidding documents as per A.1 above, including but not limited to, expenses incurred by the requirements of various Sections of Division 010000, unless specifically stated otherwise herein.
3. Changes to the Work as required by approved Change Orders shall be at the expense of the Owner, however, requests for additional payments made after the fact will not be considered.

B. OCCUPANCY BY OWNER.

1. The Owner reserves the right to occupy any portion of the project before it has been entirely completed, with the understanding that such occupancy shall in no way constitute acceptance of the work, in whole or in part, or of any work performed under the Contract, provided that such occupancy does not substantially interfere with completion of the work by the Contractor.

SECTION 012600 - CHANGE ORDERS

A. OWNER'S REPRESENTATIVE'S FIELD ORDERS

1. From time to time during progress of the Work the Owner's Representative may issue an "Owner's Representative's Field Order" which interprets the Contract Documents or orders minor changes in the Work without change in Contract Sum or Contract Time.
2. Should the Contractor consider that a change in Contract Sum or Contract Time is required he shall submit an itemized proposal to the Owner's Representative **immediately and before proceeding with the Work**. If the proposal is found to be satisfactory and in proper order, the Field Order will be superseded by a Change Order.

B. PROPOSAL REQUESTS

1. From time to time during the progress of work the Owner's Representative may issue a "Proposal Request" for an itemized quotation for changes to the Work which may result in a change to the Contract Sum or Contract Time. This document **is not a Change Order** and is not a direction to proceed with the changes described therein.

C. CHANGE ORDERS

1. Change Orders are written documents describing changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof. Change Orders must be signed by both the Owner and the Architect/Owner's Representative prior to proceeding with the Work subject to the Change Order. **REQUESTS FOR "EXTRA'S" OR OTHER ADDITIONAL PAYMENTS OVER AND ABOVE THE CURRENT CONTRACT SUM WILL NOT BE CONSIDERED WITHOUT THE PRIOR, WRITTEN APPROVAL OF BOTH THE OWNER AND THE OWNER'S REPRESENTATIVE.**
    a) INITIATION. Change Orders may be initiated by a "Field Order" or "Proposal Request" per paragraphs "A" and "B" above. In addition, either the Contractor or Owner (or Owner's Representative) may initiate a Change Order through:
        1) Discovery of a discrepancy in the Contract Documents,
        2) Discovery of concealed conditions or,
        3) Discovery, during the course of the Work, of methods of accomplishing the Work in a better or more economical manner.
    b) PROCESSING CHANGE ORDERS.
        1) Change Orders will be dated and will be numbered in sequence.
        2) The Change Order will describe the change or changes, or will refer to the Proposal Requests or Field Orders involved.
        3) The Owner's Representative will issue three copies of each Change Order to the Contractor.
        4) The Contractor promptly shall sign all three copies and return them to the Owner's Representative.
        5) The Owner and Owner's Representative will retain two signed copies in their files, and will forward one signed copy to the Contractor.
        6) Should the Contractor disagree with the stipulated change in Contract Sum or change in Contract Time of Completion, or both:
            i) The Contractor promptly shall return all three of the Change Orders, unsigned by him, to the Owner's Representative with a letter signed by the Contractor stating the reason or reasons for the Contractor's disagreement.
            ii) The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered and to seek settlement of the dispute under pertinent provisions of the Contract Documents.

SECTION 012900 – PAYMENT PROCEDURES

A. SCHEDULE OF VALUES

1. Prior to the start of construction, submit a proposed Schedule of Values to the Owner's Representative which shows a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
    a) The Schedule of Values is required to be compatible (in the same format) with the Application for Payment "Continuation Sheet", AIA G703.
2. If not requested to submit additional data or to modify the submitted Schedule of Values within ten (10) days of submittal, the initially submitted Schedule shall be deemed approved.

B. APPLICATIONS FOR PAYMENT

1. Progress payments will be made only if specifically called for in the Agreement. In all other cases, the Contractor may submit an Application for Payment (3 copies) upon Substantial Completion (95% of the Contract Sum), with the balance of the Contract Sum to be paid at Final Completion.
   a) **Paragraph #52 of the Supplementary General Conditions defines the documentation required for each payment request.**
   b) Applications for payment shall be delivered to the Owner's Project Manager at:

Department of Planning, Design, and Construction
Peoria Park District
Bradley Park Equipment Service
1314 N. Park Road
Peoria, Illinois 61604

SECTION 013100 - PROJECT MEETINGS

A. PRECONSTRUCTION CONFERENCE

1. Conduct a preconstruction conference prior to the start of the Work, at the location of the Work. Provide attendance by the designated personnel of the Contractor, including Sub-contractor's and/or suppliers of major components of the Work, if requested by the Owner's Representative.
   a) AGENDA. Discuss items of significance that could affect progress including such topics as:
      1) Tentative construction schedule.
      2) Critical Work sequencing.
      3) Designation of responsible personnel.
      4) Procedures for processing field decisions and Change Orders.
      5) Procedures for processing Applications for Payment.
      6) Distribution of Contract Documents.
      7) Submittal of Shop Drawings, Product Data and Samples.
      8) Preparation of record documents.
      9) Use of the premises.
      10) Office, Work and storage areas.
      11) Equipment deliveries and priorities.
      12) Safety procedures.
      13) First aid.
      14) Security.
      15) Housekeeping.
      16) Working hours.
      17) Permits and Permitting Agency Requirements

B. PROJECT MEETINGS

1. Project Meetings will be held per the schedule determined at the Preconstruction Conference, or as needed for proper coordination and administration of the project.
   a) AGENDA
      1) Review and correct or approve minutes of the previous progress meeting.
      2) Review progress of the Work since last meeting, including status of submittals for approval.
      3) Identify problems which impede planned progress.
      4) Develop corrective measures and procedures to regain planned schedule.
      5) Complete other current business.

C. REPORTING

1. Distribute copies of the minutes of each meeting to each party present, and to other parties who should have been present, no later than three business days after each meeting.

SECTION 013300 - SUBMITTALS

A. Requirements for shop drawings, samples, mock-ups, product data, etc., relative to specific elements or components of the work are called out in the various sections of the Technical Specifications.

1. Submit items to allow for Owner's Representative's review and approval, potential re-submission if full approval is not given, ordering, delivery, fabrication time, etc., so as to allow the Work to proceed in a timely manner and in conformance with the project schedule.

B. OTHER CONTRACTOR SUBMITTALS

1. Unless otherwise modified the Contractor shall also submit:
   a) A "bar chart" type proposed construction schedule, within ten days after award of the Bid.
   b) Other submittals as required by other section of Division 010000.

C. Submission of the required Bonds and Certificate of Insurance are to be made prior to the Owner's issuance of a Notice to Proceed.

SECTION 014000 – QUALITY/REGULATORY REQUIREMENTS

A. GENERAL: Contractors shall comply with all laws, rules and regulations governing the work.

1. When Contractor observes that contract documents are at variance with specified codes, notify Owner's Representative in writing immediately. Owner's Representative will issue all changes in accord with General Conditions.
2. When Contractor performs any work knowing or having reason to know that the work is contrary to such laws, rules and regulations and fails to so notify the Owner's Representative, Contractor shall pay all costs arising therefrom. However, it will not be the Contractor's primary responsibility to make certain that the contract documents are in accord with such laws, rules and regulations.

B. SAFETY:
1. Comply with all federal, state, and local laws, rules and regulations governing the installation/construction of the work.
2. Develop and utilize safety program and training for workmen and sub-contractor employees.

C. TESTING
1. TESTS AND INSPECTIONS REQUIRED
a) Provide all tests and inspections required by governmental agencies having jurisdiction, as required by provisions of the Contract Documents and/or as specifically required by sections of the Technical Specifications.
2. PAYMENT FOR TESTING
a) Include within the Contract Sum an amount sufficient to cover all testing, re-testing, and inspections required by the Contract documents and/or the Technical Specifications. Additionally pay for all testing and inspections required by all governmental agencies having jurisdiction.
1) The Owner will pay for any testing and inspecting specifically requested by the Owner's Representative which are over and above those described in Paragraph 1.a) above.
2) When initial tests (over and above those defined by 1.a) above) requested by the Owner's Representative indicate non-compliance with the Contract Documents, costs of initial tests associated with that non-compliance will be deducted by the Owner from the Contract Sum, and subsequent retesting occasioned by the non-compliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.
3. WAIVER OF INSPECTION AND/OR TESTS
a) Specified inspections and/or tests may be waived only by the specific written approval of the Owner's Representative, and **such waivers will be expected to result in credit to the Owner equal to normal cost of such inspection and/or test.**

SECTION 014200 - REFERENCE STANDARDS AND DEFINITIONS

A. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed for performance of a required construction activity the Contractor shall obtain copies directly from the publication source.
2. Although copies of standards needed for enforcement of requirements may be included as part of required submittals the Architect reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

B. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents they mean the recognized name of the trade association standards generating organization authority having jurisdiction or other entity applicable to the context of the text provision. Refer to the Encyclopedia of Associations, published by Gale Research Co. available in most libraries.

C. Definitions: Architect, Owner's Representative, and Owner's Project Manager
1. ARCHITECT: The Architect shall be the person or entity designated by the Owner as the Owner's Representative and shall be identified as such in the Agreement Between Owner and Contractor, and is referred to throughout the Contract Documents as if singular in number and masculine in gender.
2. OWNER'S REPRESENTATIVE: The duties of the Owner's Representative as listed in the Project Manual, include but are not limited to, construction phase observation and technical administration services.
a) LIMITS OF AUTHORITY: The Owner's Representative shall be authorized to provide approvals and interpretations concerning the plans, specifications and progress of the Work as bid, but is not authorized to change the scope of the Work on behalf of the Owner.
3. OWNER'S PROJECT MANAGER: The Owner's Project Manager will represent, act on behalf of, and provide interface between the Owner and the Contractor in respect to contract administration and/or other matters which affect the scope of the Work.
a) Unless defined otherwise in the Project Manual, the Owner's Project Manager shall be a designated member of the Planning, Design, and Construction Division of the Peoria Park District.
b) The Owner's Project Manager will also be the Owner's Representative and will provide construction phase observation and technical administration services, if a consultant Architect has not been engaged to do so, by the Owner.

SECTION 015000 – TEMPORARY FACILITIES & CONTROLS

A. MOBILIZATION
1. Furnish all labor, tools, materials, equipment, and incidentals necessary for preparatory work.
2. Provide and establish personnel, equipment, supplies, materials, offices or buildings, and other facilities necessary to work on the project.
3. Demobilize all of the above and remove temporary facilities at the completion of the project.

B. BARRIERS, PROTECTION OF SITE AND PROPERTY
1. GENERAL
a) Owner's improvements to remain, existing utilities, as well as adjacent site improvements shall be protected from damage by barriers, guards and coverings. Damaged work shall be replaced or repaired to condition prevailing at time of signing of contract, at no additional cost to Owner.
b) Provide 6' high, continuous chain link or orange plastic (used materials acceptable) construction fence to prohibit unauthorized personnel or public entry from the site of the Work. (Substitutions may be considered; submit request in writing to the Owner's Representative.)
c) Contractor shall provide, erect and maintain additional planking, fences, protective canopies, railings, shoring, lights, warning signs, etc., as needed for the protection of adjacent property and the public.
2. LANDSCAPE PROTECTION
a) All live, healthy trees, shrubs, etc. on the site or on the street fronts of the site, not specified to be removed and not interfering with installation of new work required hereunder, shall be protected against injury from construction operations.

b) All shade trees which are to remain and which are liable to damage during the building operations, shall be properly boxed and protected from damage during the course of construction work as directed by the Park District. **No site-related work shall occur until the required tree protection (fencing, boxing, etc.) has been installed and approved by the Owner or his representative.**

1) LIQUIDATED DAMAGES: The Owner reserves the right to charge the Contractor for damage to existing trees, and to deduct the charges from the amounts due the Contractor, based on the following schedule:

aa)	Broken limbs 1" or over in diameter:	$50 per caliper inch of limb
bb)	Trenching or grading within the tree dripline or 20' from the trunk, whichever is less, of trees 4" or over in caliper diameter:	$100 per tree/per foot within dripline, or within 20' minimum if applicable
cc)	Damage to tree trunks, including "barking", nicking, gouging, etc.	$150 per caliper inch of tree, per each injury

3. BARRIERS/CONSTRUCTION FENCE MATERIALS
   a) 2" open mesh chain link fence, 72" high minimum, galvanized, with appropriately sized posts; gates where indicated.
   b) Alternate barrier fencing materials may be acceptable, however, no additional payments will be made on account of approval of alternate barrier/safety fencing materials.
   c) Materials may be new or used, if in serviceable condition.
4. WATCHMAN SERVICE
   a) The Owner will not be responsible for loss due to theft or other damage which is not covered under Property Insurance. The Contractor shall make such arrangements for watchman service as he considers necessary and he shall be responsible for all loss or damage of his property, equipment, material, etc., at the site, and he shall make good such damage or loss without any additional cost to the Owner.
5. EXISTING IMPROVEMENTS - PROTECTION
   a) The Contractor shall be entirely responsible for all injuries to water pipes, electric conduits or cables, drains, sewers, gas mains, poles, telephones and telegraph lines, streets, pavements, sidewalks, curbs, culverts, retaining walls, building walls, foundation walls, or other structures of any kind met with during the progress of the Work, and shall be liable for damages to public or private property resulting therefrom.

C. CONSTRUCTION ACCESS, ROADS, AND PARKING AREAS
1. CONTRACTOR'S USE OF PREMISES
   a) The Contractor shall require that all personnel who will enter upon the Owner's property certify their awareness of and familiarity with the requirements of this Section.
2. CONSTRUCTION ACCESS
   a) To avoid traffic conflict with vehicles of the Owner's employees and customers, and to avoid over-loading of streets and driveways elsewhere on the Owner's property, limit the access of trucks and equipment to the route shown (IF SHOWN) on the Drawings as "Access Route". If access route is not shown on the Drawings, coordinate construction access and routes with the Owner's Project Manager.
   b) Do not permit such vehicles to park on any street or other area of the Owner's property except in the area shown on the Drawings as "Contractor's Parking Area". If not shown on the drawings, the Contractor's Parking Area shall be as designated by the Owner's Project Manager.
   c) Provide adequate protection for curbs and sidewalks over which trucks and equipment pass to reach the job site.
3. SECURITY
   a) Restrict the access of all persons entering upon the Owner's property in connection with the Work to the Access Route and to the actual site of the Work.

D. TEMPORARY ENVIRONMENTAL CONTROLS
1. GENERAL
   a) Provide temporary environmental controls at the site of the Work to ensure that construction operations have no harmful effects on adjacent properties and on members of the public who may come in proximity to the Work, and/or the employees of the Owner who are engaged in regular daily tasks and operations and are unable to be relocated to another work site during construction operations.
   b) Owner reserves the right to stop the Work, at the Contractor's expense, until the Contractor provides necessary control measures for the conditions listed below; additionally, the Owner reserves the right to perform or have performed necessary control measures, should the Contractor refuse to do so at the time requested and to deduct the cost of those expenses from the amount due the Contractor.
2. DUST CONTROL
   a) Provide dust control materials to minimize dust from construction operations. Prevent air-borne dust from dispersing into the atmosphere.
3. WATER CONTROL
   a). Control surface water to prevent damage to the project, the site and adjoining properties.
      1) Control fill, grading, and ditching to direct surface drainage away from excavations, pits, tunnels, and other construction areas; direct drainage to proper runoff channels or storm drainage utilities.
   b) Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
   c) Dispose of drainage water in a manner to prevent flooding, erosion silting, or runoff of silt or sediment or other damage to all portions of the site or to adjoining properties.
4. RODENT CONTROL
   a) Provide rodent control to prevent infestation of construction or storage areas.
      1) Use methods and materials which will not adversely affect conditions at the site or on adjoining properties.
5. DEBRIS CONTROL
   a) Maintain all areas free of extraneous debris, waste, and rubbish.
6. POLLUTION CONTROL
   a) Prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
   b) Provide equipment and personnel, perform emergency measures to contain all spillages, and to remove contaminated soils or liquids.
      1) Excavate and dispose of all contaminated earth off-site. Replace with suitable compacted fill and topsoil.
   c) Take special measures, as necessary, to prevent harmful substances from entering public waters, including lakes, streams, intermittent drainage channels, and storm or sanitary sewers.
7. EROSION CONTROL

a) Plan and execute construction and earthwork in a manner to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
   1) Schedule the Work to minimize the areas of bare soil exposed at one time, if possible.
   2) Provide temporary control measures such as berms, dikes, and drains to prevent runoff of silt or sediment from the site.
   3) Comply with Section 015713.

E. PROJECT IDENTIFICATION AND SIGNAGE
1. GENERAL
   a) Provide and install project identification sign, if located and/or called out on the Drawings.
2. SUBMITTALS
   a) Provide shop drawing(s) of proposed sign/sign installation to Owner's Representative for approval, prior to installation
3. INSTALLATION
   a) Provide project sign as detailed on Drawings
   b) If not detailed on Drawings provide project identification sign per the following minimum requirement:
      1) Content
         aa) Name of project
         bb) Name of Owner
         cc) Name of Architect(s) and major consultants
         dd) Names of Contractor and major subcontractors
         ee) Allow additional 200 characters of text explaining the project

      2) Construction
         aa) Size: 4' x 8'
         bb) Materials: Min. 5/8" AC DFPA Exterior Plywood, with (2) 4" x 4" x 12' long pressure treated post supports
         cc) Paint: paint front and back, seal edges, provide content as approved by Owner's Representative. Conform to recognized sign painting standards in selection of paint materials. Use only professional sign painter with three years minimum experience to apply sign graphics and lettering.
      3) Install sign in a manner consistent with length of time of construction operations. Remove sign and fill post holes at project completion.

F. FIELD OFFICES
1. TEMPORARY FACILITIES
   Provide and pay for temporary (new, or used if in serviceable condition) facilities and controls needed for the Work, if called out on the Drawings, which may include, but are not necessarily limited to:
   a) Temporary utilities such as heat, water, electricity, and telephone;
   b) Field office for the Contractor's personnel (required if shown on the Drawings; otherwise at the Contractor's option and expense).
      1) Conform with requirements for Engineer's Field Office Type B, as defined in Article 646.04 of the Standard Specifications for Road and Bridge Construction - Illinois Department of Transportation.
   c) Sanitary facilities;
   d) Enclosures such as tarpaulins, barricades, and canopies;
   e) Temporary fencing of the construction site;
   f) Project sign.
2. Comply with Federal, State, and local codes and regulations.
   a) Maintain temporary facilities and controls in proper and safe condition throughout the progress of the work. The Contractor is responsible for conformance with all safety codes and regulations for all Work under his jurisdiction, including that of Sub-Contractors.
3. Locate temporary facilities as shown on the Drawings, or as approved by the Owner's Representative if not shown on the Drawings.

SECTION 015713 – EROSION & SEDIMENT CONTROL

A. RELATED DOCUMENTS
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. SUMMARY
1. This Section includes the following:
   a) Site erosion and sediment control
   b) Silt fencing
   c) Ditch checks
   d) Erosion control blankets
   e) Culvert and inlet protection
   f) Stabilized entrance
2. Related Sections include the following:
   a) Division 31 – Earthwork.
   b) Division 32 – Exterior Improvements.

3. Erosion and Sediment Control Statement: The Peoria Park District takes the issue of construction related erosion and sediment control extremely seriously. The Peoria Park District is a community leader in the conservation and protection of our area's natural resources. This project will be watched closely by both staff and citizens for compliance with erosion and sediment control regulations and specifications.

C. QUALITY ASSURANCE
1. Materials and methods of construction shall comply with the following standards:

a) Illinois Department of Transportation
b) City of Peoria

D. PRODUCTS

1. Silt Fencing
   a) Fabric for silt fencing shall consist of woven or nonwoven filaments of polypropylene, polyester, or polyethylene. Fabric shall be resistant to degradation by ultraviolet light and heat exposure. Fabric shall be rot, insect, and mildew proof, and have a high resistance to tearing.
      1) Fabric shall comply with the following physical properties:

aa)	Grab tensile strength (lb) – ASTM D4632	200 (min)
bb)	Grab elongation @ break (%) – ASTM D4632	12
cc)	Burst strength (psi) – ASTM D751	250 (min)
dd)	Trapezoidal tear strength (lb) – ASTM D4533	75
ee)	Width (ft)	3.5 (min)
ff)	Weight (oz/sq. yd) – ASTM D3776	4.0
gg)	Equivalent opening size	30 (nonwoven)
hh)	(EOS) sieve no. – Corps of Engrs. CS-02215	50 (woven)

2. Ditch Checks
   a) Ditch checks will consist of silt fencing with the addition of wire reinforcement.
   b) Wire shall be 9 gauge.
   c) Alternate: Straw bales may be used in lieu of silt fencing
3. Posts
   a) Posts shall be standard "T" or "U" steel posts or wood with a minimum cross section of 3 square inches. Posts shall be a minimum of 60" in length. Posts shall be driven a minimum of 24" into the ground.
4. Erosion Control Blankets
   a) Excelsior Blanket: Excelsior blanket shall consist of a machine produced mat of wood excelsior of 80% 6" or longer fiber length. The wood from which the excelsior blanket is cut shall be properly cured to achieve adequately curled and barbed fibers.
      1) The blanket shall be of consistent thickness, with the fiber evenly distributed over the entire area of the blanket. The excelsior blanket shall be covered on the top side with a 90 day biodegradable extruded plastic mesh netting having an approximate minimum opening of 16 x 16 mm (5/8 x 5/8 in.) to an approximate maximum opening of 50 x 25 mm (2 x 1 in.). The netting shall be substantially adhered to the excelsior blanket by a knitting process using biodegradable thread or by an applied degradable adhesive. The netting shall be substantially adhered to the excelsior by a knitting process using biodegradable thread. The netting shall be entwined with the excelsior blanket for maximum strength and ease of handling.
      2) The excelsior blanket shall comply with the following:

aa)	Minimum width, ± 25 mm (1 in.)	600 mm (24 in.)
bb)	Minimum mass ± 10%	0.34 kg/sm (0.63 lb/sq yd)
cc)	Minimum length of roll, approximately	45 m (150 ft)

      3) The excelsior blanket shall be smolder resistant.
5. Culvert And Inlet Protection
   a) Culvert protection shall consist of a ditch check immediately upstream of every culvert entrance. Ditch check shall be installed to protect culvert interior from sedimentation.
   b) Inlet protection shall consist of purpose made devices by:

      Dandy Products, Inc.
      P. O. Box 1980
      Westerville, Ohio 43086-1980
      Phone: 1-800-591-2284
      Fax: 740-881-2791
      www.dandyproducts.com
      dlc@dandyproducts.com

      or

      NILEX, Inc.
      15171 E. Fremont Drive
      Centennial, CO 80112
      Phone: 1-800-537-4241
      Fax: 303-766-1110
      www.nilex.com
      denver@nilex.com

   c) "Or Equal" substitutions may be made with prior approval of Owner's Representative.
6. Stabilized Entrance
   a) Stabilized entrance shall consist of coarse aggregate laid over geotextile fabric.
   b) Dimensions: 70' long by 14' wide.
   c) Geotextile Fabric: as per requirements of "silt fencing".
   d) Aggregate: IDOT Class CA-1, CA-2, cA-3, or CA-4.

E. EXECUTION

1. Site Erosion And Sediment Control
   a) Contractor is responsible for fulfilling terms of City of Peoria Erosion Control Permit and all applicable portions of the "Erosion, Sediment, and Stormwater Control Ordinance of the City of Peoria".
   b) Install control devices as shown on erosion control plan.
   c) Install additional measures as needed to control erosion and sedimentation on the site.
2. Silt Fencing Installation
   a) Install silt fencing according to details in plans. The silt fence shall be entrenched to a minimum depth of 8".
   b) The silt fence shall be installed on the contour, with the ends extending up-slope.

c) Install silt fencing before commencing site clearing work.

3. Ditch Check Installation
   a) Install ditch checks according to details in plans.
   b) Install ditch checks at locations shown on plans.
   c) Install additional ditch checks as needed to control erosion within drainage swales as site conditions and weather dictate.
   d) Install ditch checks immediately after swales are graded.
4. Erosion Control Blankets Installation
   a) Install erosion control blankets as needed to control erosion in drainage swales and at the direction of the Owner's Representative.
   b) Anchor stakes shall be driven at a spacing of 2 feet on center.
5. Culvert And Inlet Protection Installation
   a) Install culvert protection at upstream entrances to all culverts.
   b) Install culvert protection to intercept waterborne silt and sediment and prevent it from entering culvert pipes.
   c) Install immediately after culvert installation.
   d) Install inlet protection according to manufacturer's written instructions at each inlet immediately after inlet construction.
6. Stabilized Construction Entrance Installation
   a) Install stabilized construction entrance and other approved measures as necessary to limit tracking of soil on to all paved surfaces.
   b) Comply with all City of Peoria codes limiting tracking of soil on to City streets.
7. Maintenance
   a) Inspect silt fences after each rainfall. Repair fencing, failures, end runs, and erosion cuts immediately.
   b) Remove soil from silt fencing after each rainfall.
   c) Erosion control maintenance and repair shall be considered incidental to the contract.
   d) Tracked soil and sediment shall be removed from all paved surfaces on a daily basis.
   e) Replace or provide new erosion and sediment control measures as needed during construction to provide protection to site and surrounding property for the entire time of construction, or until project is complete.
8. Close-Out
   a) Remove silt fencing and other erosion and sediment control devices after lawn or seeding has been established.
   b) Soil deposits remaining in place after silt fence is no longer required shall be dressed to conform to existing grade, and seeded with appropriate seed material.

SECTION 016000 – PRODUCT REQUIREMENTS

A. MATERIALS AND EQUIPMENT
   1. STANDARD SPECIFICATIONS
      a) Reference herein to known standard specifications of governmental agencies or technical societies shall refer to the latest edition of such specifications, adopted and published at date of these Specifications.
   2. MANUFACTURED ARTICLES
      a) All manufactured articles, materials and equipment to be incorporated in the work shall be new (unless otherwise specified) and of the quality specified and shall be used, erected, installed, connected, cleaned and conditioned as directed by and in conformity with job conditions to produce the best results obtainable.
         1) Field measurements for all special products and materials which requires close tolerances or fitting into other items or components of the Work shall be taken on the job by the party furnishing the materials.
   3. QUALITY ASSURANCE
      a) Per the Supplementary Instructions to Bidders, the Bidder by submission of a signed bid form, agrees to install products and equipment by brand and model name or names specified in the Technical Specifications, Divisions 02-35. Substitutions are allowed only in conformance to the following:
         1) Proprietary Specification Requirement: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
         2) Semiproprietary Specification Requirement: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted
            aa) Where either of the two cases above prevail, and the named product is accompanied by "or approved equal" substitutions will be allowed only upon written approval of the Owner's Representative prior to submission of bids.
         3) Non-Proprietary Specification Requirement: When the Specifications lists products or manufacturers that are available and are accompanied by "or equal", the Contractor may propose any available product that complies with the Specifications' requirements; however, the Owner's Representative shall determine if the produced item complies with those requirements.
         4) Descriptive Specification Requirement: Where Specifications describe a product or assembly listing exact characteristics required, with or without use of a brand, trade, or model name, provide a product or assembly that provides the characteristics and otherwise complies with the Contract Documents.
         5) Performance Specification Requirement: Where Specifications require compliance with performance requirements, provide products or assembly that comply with these requirements and are recommended by the manufacturer for the application indicated.
         6) Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standard, code, or regulation specified.
      b) VISUAL MATCHING AND SELECTION. Where the Specifications require matching an established sample or call for "as selected", the Owner's Representative's decision will be final on whether a proposed product matches satisfactorily.

B. STORAGE AND PROTECTION
   1. GENERAL
      a) Contractor shall provide and maintain:
         1) Storage for materials and equipment to be installed in Project.
         2) Protection and security for stored materials and equipment, on and off site.
         3) Protection of existing on-site elements to remain.

4) Protection of adjacent properties improvements

2. METHODS
   a) Store off grade and cover with impervious material all moisture or water vulnerable materials.
   b) Store finished products and equipment in an enclosed building, on or off site.
   c) Maintain integrity of shipping cartons until ready for installation.
   d) Provide separate storage for combustible and non-combustible products.
   e) Follow storage recommendations of product and equipment manufacturers.
   f) Other methods shall be subject to Owner's prior written approval.

3. The Contractor shall maintain an emergency phone number where a contact person can be notified at any time, Sundays and holidays included, of an emergency condition due to the work which requires immediate repair or protection.

C. SUBSTITUTIONS
1. See "SECTION 016000 – A. MATERIALS AND EQUIPMENT" for requirements pertaining to substitution of specified materials, products, equipment, etc.
2. Contractor may propose substitute materials, products, equipment, etc., after award of the Bid; however, such proposals are expected to result in a cost savings to the Owner and/or higher quality Work at no additional cost to the Owner.

D. WARRANTIES AND BONDS
1. GENERAL
   a) This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.
   b) Warranties for the Work and products and installations of each Contractor shall be one (1) year unless specified otherwise in the individual Sections of Divisions 02 through 35.
   c) Disclaimers and Limitations:
      1) Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and Contractors required to countersign special warranties with the Contractor.
      2) The responsibility of the Contractor in respect to the required warranties shall not be relieved or limited in any way by the failure of installed components, equipment, materials, etc., due to naturally occurring and/or re-occurring conditions at the site or area of the Work including, but not limited to:
         aa) ground and soil conditions, especially as related to frost heave;
         bb) high wind velocities (except those exceeding velocities normally used for calculating wind loading at the site of the Work);
         cc) rain and water damage (unless caused by winds exceeding normal design limits);
         dd) ice/snow loading on structures
         ee) and other naturally occurring or re-occurring site conditions
      3) The Contractor shall notify the Owner's Representative, prior to the award of the contract, of any part or component of the Work that is, in his opinion, not designed to accommodate the existing, naturally occurring, or re-occurring conditions of the site, and whether or not a change in the proposed methods of construction, types of equipment, etc., will affect the bid price.
         aa) Should the proposed change in construction methods, equipment type, etc., result in additional expense, the Owner reserves the right to request proposals from the other bidders and to make award the contract based on the bid amount which includes the proposed change.
2. WARRANTY REQUIREMENTS
   a) Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
   b) Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

   c) Replacement cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.
   d) Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights or remedies.
      aa) Rejection of Warranties: The Owner reserves the rights to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
   e) The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
   f) For specific warranty requirements related to landscape materials, refer to the applicable Section.
3. SUBMITTALS
   a) Submit written warranties to the Owner's Representative prior to the date certified for Substantial Completion. If the Owner's Representative's Certificate of Substantial Completion designates a commencement date for warranties other that the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Owner's Representative.
      1) When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner's Representative within fifteen days of completion of that designated portion of the Work.

b) Form of Submittal: At Final Completion, compile two copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, Subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

c) Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2" by 11" paper.

d) Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the 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 the installer.

e) Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the project title or name, and the name of the Contractor.

f) When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

SECTION 017300 – EXECUTION

A. GEOTECHNICAL DATA

1. If the Owner has caused borings or other subsurface investigations to be made, the data or report pursuant to these investigations will be included in the Project Manual, as an Appendix, and labeled as such.
2. The Owner and Owner's Representative do not guarantee the accuracy or validity of the data, nor do they assume any responsibility for the Contractor's interpretation of the data.
3. The Contractor's may, at his option, perform additional subsurface investigation, however, it shall be at the Contractor's sole expense.

B. FIELD ENGINEERING

Provide such field engineering services as are required for proper completion of the Work including, but not limited to:

1. Establishing and maintaining lines and levels
2. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.
3. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks and control points. Preserve permanent reference points during construction.

C. COORDINATION OF TRADES AND SUB-CONTRACTORS

1. The Contractor shall be responsible for the proper fitting of all work and for the coordination of the operation of all trades, sub-contractors, or materials and men engaged upon the work. He shall be prepared to guarantee to each of his subcontractors the dimensions which may be required for fitting of their work to all surrounding work and shall do, or cause his agents to do, all cutting, fitting, adjusting and patching necessary to make the several parts of the work come together properly and fit the work to receive, or be received by that of other contractors.
2. When two or more prime contracts are being executed at one time in such manner that the work on one contract may interfere with the work of another, the Owner's Representative shall decide which contractor shall cease work and which shall continue, or whether the work on both contracts may progress at the same time and in what manner.
    a) The Contractor shall not cause any unnecessary hindrance or delay to any other contractors on the premises, and shall be responsible for all damages done to the work of other contractors caused by him or by his employees.

D. REFERENCE AND CONTROL POINTS PROVIDED BY OWNER

In addition to layout procedures provided by the Contractor for proper performance of the Contractor's responsibilities:

1. Locate and protect existing control points before starting work on the site.
2. Preserve permanent reference points during progress of the Work.
3. Do not change or relocate reference points or items of the Work without specific approval from the Owner's Representative.
4. Promptly advise the Owner's Representative when a reference point is lost or destroyed, or requires relocation because of other changes in the Work.
5. Upon direction of the Owner's Representative, require the field engineer to replace reference stakes or markers.
6. Locate such replacement according to the original survey control.

E. REFERENCE AND CONTROL POINTS PROVIDED BY THE CONTRACTOR

1. If not provided by the Owner (and defined as the responsibility of the Owner in the Contract Documents) establish sufficient general reference points in the form of permanent bench marks, grade stakes or other markers as will enable the Contractor to proceed with the Work.
2. The Contractor may lay out his own work, or cause the Work to be laid out by a qualified party such as a Registered Land Surveyor or a Professional Engineer, as necessary.
3. The Contractor shall establish and be responsible for all lines, elevations and measurements of the structure utilities, installations, and other Work executed by him under the contract.
    a) Exercise proper precautions to verify the figures and dimensions shown on the drawings before laying out the work; be responsible for any error resulting from failure to exercise such precaution.

SECTION 017329 - CUTTING AND PATCHING

A. CHASES AND OPENINGS

1. The Contractor is responsible for the provision and/or coordination of all chases, openings and recesses required by work of his own forces, subcontractors or separate contractors.
    a) Each subcontractor or separate contractor shall be responsible for furnishing advance information to the General Contractor as to exact dimensions and locations of such chases and openings, and shall provide and set in place all necessary sleeves, inserts and forms.
    b) Openings shall be accurately located, neatly cut, and no larger than necessary. Provide all rebuilding, patching, refinishing and painting required to restore the construction to original condition.
2. Provide shoring, bracing, and support as required to maintain structural integrity of the project.
3. Provide protection from cutting and patching operations as required for other portions of the project; protect the Work and existing improvements in proximity to the cutting and patching operations from the elements.

SECTION 017419 – CONSTRUCTION WASTE MANAGEMENT & DISPOSAL

A. PERIODIC CLEANING

1. Each Contractor shall clean up after his own work as needed and/or ensure that sub-contractors clean up after their work and remove accumulations of waste, debris, and rubbish caused by construction operations.
    a) Remove all waste, rubbish and debris on a daily basis (if needed), as they accumulate, and after completion of the Work.

B. PROJECT COMPLETION

1. On completion of the project, the entire job shall be cleaned up and left in perfect condition, including adjacent areas.
    a) Marred surfaces shall be patched or repaired and touched up to match adjoining surfaces.
    b) All rubbish shall be removed from the site before acceptance.
    c) New surfaces and/or exposed elements of the Work shall be protected from stain and marring. These surfaces shall be cleaned to the satisfaction of the Owner's Representative or replaced if said stains or mars are unable to be completely removed

C. GOVERNMENTAL REGULATIONS

1. Conduct cleaning and disposal operations in compliance with Federal, State and local ordinances and anti-pollution laws and regulations.

SECTION 017700 - PROJECT CLOSEOUT

A. GENERAL

Work includes:

1. Substantial Completion.
2. Final Completion
3. Closeout submittals.
4. Instruction

B. SUBSTANTIAL COMPLETION

1. Prepare and submit the list ("punch-list") required by the first sentence of Paragraph 9.8.2 of the General Conditions.
    a) Within a reasonable time after receipt of the list the Owner's Representative will inspect to determine status of completion. Should the Owner's Representative determine that the Work is not Substantially Complete:
        1) The Owner's Representative will so notify the Contractor, in writing, giving the reasons therefore.
        2) Remedy the deficiencies and notify the Owner's Representative when ready for reinspection.
        3) The Owner's Representative will reinspect the Work.
    b) When the Owner's Representative concurs that the Work is Substantially Complete:
        1) The Owner's Representative will prepare a "Certificate of Substantial Completion" on AIA form G704, accompanied by the Contractor's list of items to be completed or corrected, as verified and approved by the Owner's Representative.
        2) The Owner's Representative will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

C. FINAL COMPLETION

1. Prepare and submit the notice required by the first sentence of Paragraph 9.10.1 of the General Conditions.
    a) Verify that the Work is complete including, but not necessarily limited to, the items mentioned in Paragraph 9.8.2 of the General Conditions. Certify that:
        1) the Contract Documents have been reviewed;
        2) the Work has been inspected for compliance with the Contract Documents;
        3) the Work has been completed in accordance with the Contract Documents;
        4) equipment and systems have been tested as required, and are operational;
        5) the Work is completed and ready for final inspection.
    b) The Owner's Representative will make a final inspection to verify status of completion and if all "punch-list" items have been completed, and upon receipt of the Contractor's Final Application for Payment, issue a Certificate of Final Completion. Should the Owner's Representative determine that the Work is incomplete or defective:
        1) The Owner's Representative will so notify the Contractor, in writing, listing the incomplete or defective work.
        2) Remedy the deficiencies promptly, and notify the Owner's Representative when ready for reinspection.
    c) FINAL APPLICATION FOR PAYMENT
        1) Submit a final Application for Payment to the Owner's Representative, showing all adjustments to the Contract Sum.
        2) If needed, the Owner's Representative will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.
        3) Include final waivers of lien from the Contractor, sub-contractors, and major suppliers.
        4) Final payment will not be released until all close-out submittals have been made, final cleaning has been performed, and required instruction(s) to Owner's personnel have been accomplished.

D. CLOSEOUT SUBMITTALS

1. When the Owner's Representative determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals. Closeout submittals include, but are not necessarily limited to:
    a) Project record documents described in "Section 017839".
    b) Operation and maintenance manuals/data as described in "Section 017823".
    c) Warranties and bonds as described in "Section 016000".
    d) Keys and keying schedule;
    e) Spare parts and materials extra stock;
    f) Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
        1) Certificates of Inspection, as required
        2) Certificate(s) of Occupancy

g) Certificates of Insurance for products and completed operations;
h) Evidence of payment and release of liens.
1) Consent of Surety to Final Payment
2) Contractor's Final Waiver of Lien
3) Separate releases or Waivers of Lien for sub-contractors, suppliers and others with lien rights against the Owner, together with a list of those parties.
i) List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

SECTION 017823 - OPERATING/MAINTENANCE MANUALS & INSTRUCTION

A. GENERAL
1. Compile operating/product data and related information appropriate for Owner's maintenance and operation of products and equipment provided under the Contract.
2. Instruct Owner's personnel in operation and maintenance of products, equipment and systems.
3. OPERATIONS AND MAINTENANCE DATA REQUIRED:
a) Operating and maintenance manuals are required for each area of Work which is listed below, if that area of Work is included within the scope of Work of the project:
1) HVAC
2) Plumbing – including water supply, sewage and waste disposal
3) Electrical
4) Landscape irrigation system
5) Fire sprinkler system
6) Communications equipment and systems
7) Materials and finishes

B. OPERATIONS/MAINTENANCE MANUALS - FORM OF SUBMITTAL
1. Prepare operating and maintenance manuals in the form of an instructional manual, utilizing heavy-duty, durable 3-ring vinyl covered loose-leaf binders, for use by the Owner's operating personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder. Provide when drawings or diagrams are required as part of the manual.
2. Provide sturdy manila or kraft envelope, accordion type file folder, or cardboard file boxes, properly labeled, of sufficient size to contain all submittals.
3. Submit one copy of data in final form at least fifteen days before final inspection. This copy will be returned within fifteen days after final inspection, with comments. After final inspection make corrections or modifications to comply with the Owner's Representative's comments and submit three copies of each approved manual to the Owner's Representative
4. WARRANTIES, BONDS AND SERVICE CONTRACTS
a) Provide a copy of each warranty, bond or service contract in the appropriate manual for the information of the Owner's operating personnel. Provide written data outlining procedures to be followed in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond. Provide list for each product containing name, address, and phone number of:
1) Contractor.
2) Subcontractor.
3) Maintenance contractor, as appropriate.
4) Local supply source for parts and replacement.
b) Identify area of responsibility of each contractor.

C. MANUAL FOR MATERIALS AND FINISHES
1. Submit two (2) copies of complete manual in final form.
2. Refer to individual Specification Sections for additional requirements on care and maintenance of materials and finishes.
3. Content for products, applied materials and finishes:
a) Manufacturer's data, giving full information on products.
1) Catalog number, size, composition.
2) Color and texture designations.
3) Information for re-ordering special-manufactured products.
4. Instructions for care and maintenance.
a) Manufacturer's recommendations for types of cleaning agents and methods.
b) Cautions against cleaning agents and methods detrimental to product.
c) Recommended cleaning and maintenance schedule.
5. Moisture-Protection and Weather-Exposed Products: Provide complete manufacturer's data with instructions on inspection, maintenance and repair of products exposed to the weather or designed for moisture-protection purposes.
6. Manufacturer's Data: Provide manufacturer's data giving detailed information, including the following, as applicable:
a) Applicable standards.
b) Chemical composition.
c) Installation details.
d) Inspection procedures.
e) Maintenance information.
f) Repair procedures.

D. INSTRUCTION
1. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work including, but not limited to;
a) Mechanical

b) Water supply
c) Electrical service/distribution and lighting
d) Other items or systems as required in individual sections of the Technical Specifications

2. Instructions for the Owner's Personnel: For instruction of the Owner's operating and maintenance personnel, use experienced instructors thoroughly trained and experienced in the operation and maintenance of the equipment or system involved.

SECTION 017839 - PROJECT RECORD DOCUMENTS (AS-BUILTS)

A. DOCUMENTS REQUIRED AT SITE

1. The Contractor shall maintain at the job site one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders, and other Contract modifications.
   a) Each of these project record documents shall be clearly marked **"Project Record Copy**"
   b) Shall be maintained in good condition
   c) shall be available at all times for inspection by the Park District, and shall not be used for construction purposes.

B. Project-record drawings shall be marked up to show significant changes made during construction progress, referenced to visible and accessible features of the structures. Project-record drawings shall be kept current and no work shall be concealed until required information has been recorded.

C. Record-documents shall be submitted in satisfactory condition to the Park District at the completion of the project. **FINAL COMPLETION OF THE PROJECT WILL NOT BE ATTAINED, AND FINAL PAYMENT WILL BE WITHHELD, UNTIL PROJECT "AS-BUILTS" ARE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.**

END OF GENERAL REQUIREMENTS

PROJECT MANUAL FOR: **Natatorium HVAC Replacement**
RiverPlex Recreation and Wellness Center
600 N. E Water St.
Peoria, IL 61603

OWNER: Peoria Park District
1314 N. Park Road
Peoria, IL 61603

MECHANICAL ENGINEER: apace**Design** Architects + Engineers
2112 E. War Memorial Drive
Peoria, IL. 61614-8002

ELECTRICAL ENGINEER: Keith Engineering Design Inc.
707 N.E. Jefferson Ave.
Peoria, IL 61603

STRUCTURAL ENGINEER: Hanson Professional Services Inc.
7625 N. University St. Suite 200
Peoria, IL 61614

DATE: 15 December 2020

SPECIFIERS: **apace**Design Architects + Engineers
Mechanical: Mark A. Cordes
Tel.: (309) 685-4722 Cell: 309 339 7987
Email markc@apacedesign.com

Keith Engineering Design
Electrical: Tracy D. Caulkins
Tel.: (309) 938-4005 Fax: (309) 214-0063

Hanson Professional Services
Structural: Tom DeJarld
Tel.: (309) 691-0902 Fax: (309) 691-1327

SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
   1. Footings.
   2. Walls.
   3. Slabs-on-grade.

B. Related Sections: Section 312010 "Earth Moving for Structures".

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
   1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer, manufacturer, testing agency, upon request.

1. Aggregates.

B. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications (engaged and paid for by Owner): An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
   2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
   1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
   2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Owner shall engage and pay for a qualified independent testing agency to perform material evaluation tests.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement where applicable.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
   1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.

D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
   1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
   1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
   2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
   3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
   1. Portland Cement: ASTM C 150, Type I gray. Supplement with the following:
      a. Fly Ash: ASTM C 618, Class F or C.

B. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
   1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
   1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   2. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
   3. Accessory Materials: Crack Fill Binder.

C. Synthetic Micro-Fiber Reinforcement: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1 to 2-1/4 inches (25 to 57 mm) long.”

2.6 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A, compatible with finish flooring where scheduled.

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.8 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
   4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
   1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
   2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
   3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
   4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.9 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
   1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
   1. Fly Ash: 25 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducingadmixture in concrete, as required, for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
   3. Use water-reducing admixture in pumped concrete, , concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Proportion normal-weight concrete mixture as follows:
   1. Minimum Compressive Strength: 4500 psi at 28 days.
   2. Maximum Water-Cementitious Materials Ratio: 0.45.
   3. Slump Limit: 4 inches or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
   4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
   5. Slab-on-Grade Reinforcing Admixture: provide Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd.”

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
   1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air

temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
   1. Class A, 1/8 inch for smooth-formed finished surfaces.
   2. Class C, 1/2 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
   1. Install keyways, reglets, recesses, and the like, for easy removal.
   2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
   2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
   3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.
   1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
   2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.
   1. Unroll vapor retarder with the longest dimension parallel with the direction of the concrete pour.
   2. Lap vapor retarder over footings and/or seal to foundation walls.
   3. Seal all penetrations (including pipes, conduits, and electrical floor boxes) per manufacturer’s instructions.
   4. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
   5. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches, and taping all four sides with tape.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
   1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
   1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
   1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
   2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
   3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
   4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
   5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
   6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
   7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.6 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to exterior concrete surfaces exposed to public view, or to be covered with a coating or covering material applied directly to concrete.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
   1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
   2. Finish and measure surface so gap at any point between concrete surface and an unleveled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.

C. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
   1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
   1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:
   1. Coordinate sizes and locations of concrete bases with actual equipment provided.
   2. Construct concrete bases 4 inches high unless otherwise indicated; and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
   3. Minimum Compressive Strength: 4000 psi at 28 days.
   4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
   5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete substrate.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
   1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.13 FIELD QUALITY CONTROL

A. Testing: Owner will engage and pay for a qualified testing agency to perform field tests and prepare test reports.

B. Inspections: Owner will engage and pay for a special inspector to perform building code-required inspections.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least one composite sample for each 25 cu. yd. or fraction thereof of each concrete mixture placed each day.
      a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
   2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
   4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
   5. Compression Test Specimens: ASTM C 31/C 31M.
      a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
   6. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
      a. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
   7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
   8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
   9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete

mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

SECTION 051200 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Structural steel.

2. Grout.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each

weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.

4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer, fabricator, and testing agency, upon request.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

D. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shear stud connectors.
5. Shop primers.
6. Nonshrink grout.

E. Source quality-control reports, upon request.

1.7 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

B. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 360.
3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using

pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A 992/A 992M.

B. Channels, Angles-Shapes: ASTM A 36/A 36M.

C. Plate and Bar: ASTM A 36/A 36M.

D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, Grade B, structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.

B. Anchor Rods: ASTM F 1554, Grade 36, **straight.**

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Galvanized.

C. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
3. Finish: Galvanized.

2.3 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

2.4 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.5 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened unless noted otherwise.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.6 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.7 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize all exterior exposed steel.
3. Where noted.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

C. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

   1. Level and plumb individual members of structure.

D. Splice members only where indicated.

E. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage and pay for a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Testing Agency: Owner will engage pay for a qualified testing agency to perform tests and inspections.

C. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

B. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 051200

SECTION 230000 – COMMON ITEMS HVAC

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide: See Individual Division 230000 Sections

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 010000- General
   2. 012600 – Change Orders
   3. 012900 – Payment Procedures
   4. 013100 – Project Meetings
   5. 013300 – Submittals
   6. 014000 – Quality/Regulatory Requirements
   7. 014200 – Reference Standards and Definitions
   8. 015000 – Temporary Facilities and Controls
   9. 016000 – Product Requirements
   10. 017300 – Execution
   11. 017329 – Cutting and Patching
   12. 017419 – Construction Waste Management and Disposal
   13. 017700 - Project Closeout
   14. 017823 – Operating/Maintenance Manuals and Instruction
   15. 017839 – Project Record Documents (As-Builts)
   16. 230130 – HVAC Air Duct Cleaning
   17. 230529 – Supports and Anchors for HVAC
   18. 230533 – Heat Tracing for HVAC Piping
   19. 230553 – Identification for HVAC Pipe and Equipment
   20. 230593 – Testing, Adjusting and Balancing for HVAC
   21. 230710 – HVAC Piping and Equipment Insulation.
   22. 230720 – HVAC Ductwork Insulation.
   23. 230900 - Temperature Controls.
   24. 232113 – Hydronic Piping.
   25. 232114 – Hydronic Specialties.
   26. 232123 – HVAC Pumps.
   27. 233100 - Ductwork.
   28. 233300 – Air Duct Accessories.
   29. 233423 - Fans.
   30. 233600 – Air Terminal Units.
   31. 233713 – Diffusers, Registers and Grilles.
   32. 237490 – Packaged Dehumidifier/ AC unit.
   33. 238216 – Air Coils

1.03 SYSTEM DESCRIPTION

A. Exterior mounted package De-Humidifier/ AC Unit shall replace the function Of the Existing Unit. A fluid cooler mounted in the same area as the existing condenser shall operate to remove waste heat. A New piping system shall connect the fluid cooler with the package dehumidifier unit. Minimum Exhaust amounts shall be removed from the building with separate fans and duct that will not allow mixing of the heavy chloramine laden air present at the deck level with fresh air. The existing floor level fan shall be modified to help provide a “purge” function for the facility. Deteriorated return duct shall be replaced with new aluminum duct. New rigid aluminum supply duct with adjustable aluminum diffusers shall be utilized to distribute air through-out the space. New Temperature controls shall include a combination of the Packaged unit controls with an adaptation of

the Owner's Preferred Building Automation system. New controls shall allow monitoring of the new system by the manufacturer for a period of 2 years.

B. Definitions:
1. Ventilating Contractor = Ventilating Subcontactor.
2. Supply Ductwork - That duct downstream of coils, heaters and similar air conditioning equipment and which discharges to a space.
3. Exhaust Ductwork – That duct downstream of exhaust registers and grilles which discharges to the out-of-doors.
4. Return Ductwork - That duct upstream of coils or heaters or similar air conditioning equipment and which is downstream of room air intakes.
5. Provide - Both Furnish and Install.

1.04 QUALITY ASSURANCE

A. See individual Technical Sections

1.05 REGULATORY REQUIREMENTS AND STANDARDS

A. See Individual Technical Sections

1.06 SUBMITTALS

A. Submit under provisions of Section 013300. Contractor Review before forwarding to the Architect/ Engineer. Double check quantities, performance characteristics, dimensions, and electrical characteristics submitted against that specified and scheduled. Verify proposed equipment is specified.

B. Product Data: (Provide in PDF Format)
1. Provide data that will enable reviewers to be able to confirm equipment is usable for the specified instance.

C. Shop Drawings:
1. Shall be in a PDF format. Drawing size shall be large enough to be readable when printed on paper.
2. Shall have title block that identifies the vendor. Sub- contractor or contractor submitting the drawing. Shall be dated when the submittal was made. Shall be peculiar to the project. Information which does not apply for the project shall be removed or struck out.

D. Provide a separate line item the contractor's Schedule of Values for each Subcontractor or equipment vendor providing service or equipment. Show Separate lines for labor and material. Amounts shown shall be proportional to the amount of labor, equipment and materials shown.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Sections 017839 and 017700. Include as a separate closeout submittal.
B. Show changes made to layouts on Bidding documents.

1.08 COORDINATION

A. Main HVAC Contractor shall coordinate all aspects of the installation.
B. Supply Manufacturer's Product data and Drawings to entity creating drawings for structural supports.
C. Supply Manufacturer's control sequences and points lists to the temperature control sub- contractor.

D. Supply Manufacturer's product data and connection drawings to the Electrical sub-contractor.
E. Supply Manufacturer's product data and connection drawings to the Piping sub-contractor if applicable.
F. Supply Manufacturer's product data and connection drawings to the Sheet Metal sub-contractor if applicable.
G. Work to meet Owner's schedules. Do not remove existing equipment from operation until allowed by the Owner. Be certain equipment is scheduled to arrive on site in time for the schedule.
H. Be certain owner can continue their operations within the building. Confirm interruption of Electric power, Heating water service, access To Owner's traffic patterns and similar situations with the Owner as required by the Owner.

PART 2 – PRODUCTS (Not Applicable This Section)

PART 3 - EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Coordinate work with other trades and Contractors. Review Drawings of other Contracts to determine interaction between trades.

3.02 ACCESS TO EXISTING Areas

A. Lay-in Ceilings:
1. Remove ceiling panels and cross tees as required to access work.
2. Store removed materials on-site. Protect from damage.
3. Determine existing damage before work commences. Document degree with Owner and Architect/ Engineer.
4. Replace ceiling material broken during access, demolition, or installation operations.
5. Replace ceiling components to original condition when complete.
6. Temporarily secure items as lighting, speakers, diffusers, etc. where cross tees are removed.

B. Equipment Rooms and Adjoining Areas
1. Protect equipment and systems which are not designated for removal or which are not connected to the systems being removed.
2. Protect pathways and spaces underneath work areas.
3. Provide temporary closures on removed louvers on a daily basis. Seal against air infiltration. Minimize time when opening is open, during ambient temperatures less than 65 degrees F and greater than 75 degrees Fahrenheit. Coordinate Owner's need to operate the air handling units within the equipment room. Avoid creating noxious fumes in the equipment room while part of the building served by the air supply units therein is in use by the Owner's clientele.

END OF SECTION 230000

SECTION 230130 – HVAC AIR DUCT CLEANING

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Cleaning of existing return louver and duct and screened floor intake and duct located on the locker room and corridor walls.
      b. Clean existing outdoor air louvers and dampers.
      c. Removal and replacement of existing lay-in ceilings as required to access existing duct.
      d. Addition of access openings in duct to accommodate cleaning process.
      e. Removal and replacement of screens, louvers and registers as required to access duct for cleaning

1.02 RELATED WORK

A. Specified Elsewhere:
   1. Paragraphs concerning temporary Facilities and Controls as noted in Division 0 specifications.

1.03 SYSTEM DESCRIPTION

A. Existing systems shall be revised and reworked to meet requirements of ventilation scheme.

B. Definitions:
   1. Ventilating Contractor = Ventilating Subcontactor.
   2. Supply Ductwork - That duct downstream of coils, heaters and similar air conditioning equipment and which discharges to a space.
   3. Exhaust Ductwork – That duct downstream of exhaust registers and grilles which discharges to the out-of-doors.
   4. Return Ductwork - That duct upstream of coils or heaters or similar air conditioning equipment and which is downstream of room air intakes.

1.04 QUALITY ASSURANCE

A. Installers and Fabricators shall be fully familiar with S.M.A.C.N.A Construction Standards.

B. Duct cleaning contractors shall be certified by the NADCA or a similar Nationally recognized group or shall have a long standing history of experience as a duct cleaning contractor within the community.

1.05 REGULATORY REQUIREMENTS AND STANDARDS

A. NADCA 01-1992 - Mechanical Cleaning of Non Porous Air Conveyance System Components.

B. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

C. International Mechanical Code 2012.

1.06 SUBMITTALS

A. Submit under provisions of Section 013300

B. Product Data: (Provide in PDF Format)
   1. Provide data for manufactured access doors.
   2. Provide material safety data sheets for cleaning agents.

C. Duct Cleaning:
   1. Provide contractor certifications.
   2. Provide an action plan describing how work is to be accomplished for this particular project. Include part provide as PDFs for A/E review.

D. Provide a separate line item the contractor’s Schedule of Values.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Sections 017839 and 017700. Include as a separate closeout submittal.
B. Record locations of access doors added for duct cleaning.
C. Provide “before” and “after” photos of each section of duct cleaned from the same perspective.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item, which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

PART 3 - EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Coordinate work with other trades and Contractors. Review Drawings of other Contracts to determine interaction between trades.

B. Review extent of existing systems with Owner. Coordinate shut-downs of existing equipment affected by duct removal or by changes to that equipment.
   1. No work in any building shall begin until all contractors are ready to prosecute the work diligently except as allowed by the Owner.
   2. Duct cleaning work shall be scheduled during normal working hours unless special arrangements are made with the Owner and A/E.

3.02 CLEANING

A. Access:
   1. Use entries created by installation of new dampers and removal of existing ducts and grilles.
   2. Provide access doors per Section 233300 or as noted below, in mains which are not otherwise accessible.
   3. Remove and replace metal pan and lay-in ceilings in areas not otherwise under construction.

4. Install additional access panels in duct at obstructions in duct which include dampers, turning vanes and risers. Access panels shall be installed within reach of accessible ceilings.
5. Access panels shall be either manufactured or shall be flat aluminum sheet. Screw to the duct on 4" centers.

B. Protection of System:
1. Seal downstream and upstream duct from cleaning operation.

C. Cleaning:
1. Cleaning hall be done in accord to NADCA 01-1992 and as written below.
2. Loose materials shall be removed from system.
3. Designated ductwork shall be cleaned free of visible contaminants on all interior surfaces.
4. Above floor duct shall be cleaned using dry processes.
5. Screens shall be mechanically brushed so that no blockage is visible on either side of the screen.
6. Dispose of all dirt, dung, leaves, scrap paper, bodies, skeletons, feathers and similar debris in accord to Division 0.

3.03 FIELD QUALITY CONTROL

A. Coordinate duct-cleaning activity with Owner and Architect/ Engineer. Owner and Architect/ Engineer will make spot inspections to verify work is per specification. Owner's spot inspection will not constitute a final approval of work. Dirty areas found after Owner' and Architect/ Engineer's inspections will need to be cleaned. A determination by the Owner that work is not being performed to standards and specification will cause a need for all previous cleaning work to be redone.

3.04 ACCESS TO EXISTING DUCT

A. Lay-in Ceilings:
1. Remove ceiling panels and cross tees as required to access work.
2. Store removed materials on-site. Protect from damage.
3. Determine existing damage before work commences. Document degree with Owner and Architect/ Engineer.
4. Replace ceiling material broken during access, demolition, or installation operations.
5. Replace ceiling components to original condition when complete.
6. Temporarily secure items as lighting, speakers, diffusers, etc. where cross tees are removed.

END OF SECTION 230130

SECTION 230529 - SUPPORTS AND ANCHORS FOR HVAC

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Pipe and equipment hangers and support for HVAC equipment, duct, control conduit, propylene glycol pipe and revised heating water piping.
      b. Sleeves and seals, and firestopping for penetrations involving new duct and pipe.
      c. Penetrations required in existing walls, floors and roofs.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230710 – HVAC Piping and Equipment Insulation.
   2. 230720 – HVAC Ductwork Insulation.
   3. 232113 – Hydronic Piping.
   4. 232114 – Hydronic Specialties.
   5. 232123 – Hydronic Pumps.
   6. 233423 – Fans.
   7. 233100 – Ductwork.
   8. 237490 – Packaged Dehumidifier / AC Units

1.03 SYSTEM DEFINITION

A. HVAC piping includes heating water supply and return, propylene glycol supply and return and fill piping.
B. Definitions
   1. Provide means both to furnish and install

1.04 REFERENCES

A. AISC - American Institute of Steel Construction.

B. ASME B31.9 - Building Services Piping

C. ASTM F708 - Design and Installation of Rigid Pipe Hangers.

D. ASTM E814 - Fire Stop Sealant.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide manufacturers catalog data including load capacity and firestopping capability. Submit installation techniques to be used for intumescent putty sealants.

1.06 REGULATORY REQUIREMENTS

A. International Mechanical Code 2012 for support of HVAC piping and duct.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item, which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 PIPE HANGERS AND SUPPORTS

A. Acceptable Manufacturers.
1. B-Line.
2. Grip Strut.
3. Fee and Mason.
4. Grinnel.
5. Unistrut.

B. Hanger Description:
1. Clamps for attachment to bar joists and beams shall be C-clamps with retaining straps or steel or malleable iron adjustable beam clamps equal to B-Line Figure B-3036 with B-3360 services strap and Figure B-3040.
2. Strut supports shall be primed 14 or 12 gauge rolled carbon steel with galvanized die-formed accessory clamps and fasteners.
3. "J-Hooks" for 2" pipe and smaller shall be 1/4" thick by 1-1/4" wide steel rated for 200 lbs each.
4. Pipe "Floor Supports" shall have a steel floor flange with Predrilled mounting holes. Vertical supports shall be standard weight pipe, welded to the flange, which can be field cut to the desired length. Upper connection shall be a steel pipe saddle welded to a standard weight pipe one size smaller than the pipe in the floor support. Pipe with saddle shall be threaded and a fitting provided that can be used to adjust the final assembly height. Provide a "U-bolt" to fit saddle and pipe.

C. PVC and steel HVAC Pipe: (Heating Water, Propylene Glycol, condensate drain and Propylene glycol fill pipe)
1. Conform to ASME B31.9 and ASTM F708.
2. Hangers for Pipe Sizes 2" and under: Carbon steel, adjustable, Clevis.
3. Multiple or Trapeze Hangers: Steel strut or channels with spacers and hanger rods.
4. Vertical Support: Steel riser clamp.
5. Copper Pipe Support: Carbon steel ring, adjustable, copper plated or strut with neoprene inserts. Neoprene inserts shall be full depth of insulation.
6. Galvanized pipe shall utilize galvanized hangers.
7. Wall Support: "J-Hooks", struts.
8. Alternative support for insulated pipe shall be strut sized for 4" long copper sleeve that passes both pipe and insulation.

2.03 ACCESSORIES

A. Hanger Rods
1. Used within the mechanical room:
a. Mild steel continuous threaded national coarse thread.
b. Nuts shall be SAE Grade 3 minimum with cadmium plating and national coarse thread.
c. Lock washers shall be cadmium plated split spring type sized for the rod.
2. Used within the Natatorium or Natatorium ceiling space.

a. Shall be manufactured of glass re-enforced Vinyl Ester rated for a minimum of 400 lbs in tension.
b. Shall have a minimum design load safety factor of 3.0
c. Nuts shall contain sufficient thread engagement to accommodate the tensile loading of the rod.

B. Auxiliary Steel and Aluminum supports and Trapeze Hangers.
1. Shall be Schedule 40 steel pipe or rolled steel shapes complying with AISC manual where used within the mechanical room. Steel outside of the buildings shall comply with the structural specifications.
2. Manufactured struts used outside of the Natatorium or Ceiling space above the natatorium shall be rolled of 12 gauge material to meet loading required or as noted on Drawings or otherwise specified. It shall have a hot dipped galvanized coating.
3. Manufactured struts used within the natatorium or its ceiling space shall be extruded from aluminum alloy 6063-T6. Fittings and accessories shall be made from aluminum alloy 5052-H32.

C. Acceptable Products.
1. B-Line.
2. Uni-strut.
3. Grip Strut.

2.04 ANCHORS

A. Masonry or concrete type for pipe or equipment supports. Shall be wedge type with either studs or National coarse female thread. Alternative type shall be self drilling expansion type. Anchors shall be U. L. listed.

B. Masonry or concrete type for securing escutcheons to masonry shall be "nail-in" type. Unit shall consist of broad head on hollow zinc alloy core with steel drive pin. Provide with dielectric washer.

2.05 EQUIPMENT CURBS AND PADS

A. Cast-in-place concrete shall be as specified in Structural documents

B. Roof Support Rails shall:
1. Be loose set type manufactured specifically for use on single ply membrane roofs. Construct of recycled rubber or sunlight resistant plastic material and galvanized steel strut.

C. Pipe Penetrations shall:
1. Have sunlight resistant ABS plastic curb cap.
2. Have sunlight resistant EPDM rubber boots of stepped size for penetration of pipe.
3. Have stainless steel worm gear tightened band clamps.
4. Have 16 gauge welded galvanized steel cap with integral sleeves.
5. Shall be coordinated to fit the existing roof curb.

D. Acceptable Manufacturers:
1. Pate.
2. Thy.
3. RPS.

2.06 FLASHING

A. Curb flashing shall be as detailed on drawings.

2.07 SLEEVES

A. Sleeves for Pipes through Walls Rated at less than one hour. 22 gauge galvanized steel.

B. Sleeves for Pipes through Walls Rated at one hour or greater or all masonry walls. Schedule 40 or standard weight galvanized steel pipe.

C. Sleeves for Ductwork: Galvanized steel.

D. Sleeves for pipes through exterior masonry walls. Schedule 40 solid PVC.

2.08 SEALANTS

A. Fire Stopping - Shall comply with UL1479 and ASTM E0814. Shall have an installed F rating of two hours.

B. Fire stopping for metal pipe and conduit shall be tube or trowel applicable and shall remain pliable. Material shall be waterproof or paintable with latex paint.

C. Fire stopping for plastic pipe and insulated pipe and cables shall be intumescent type. It shall be capable of expansion of ten times its original volume when contacted with fire temperatures.

D. Exterior moisture sealant - Shall be non-hardening silicone type rated for temperatures of -40 degrees F to 250 degrees F. Material shall be available in white, gray, brown, and black colors. Material shall be sunlight resistant.

E. Interior sealant shall be silicone type rated for temperatures of 0 degrees F to 250 degrees F. Material shall be available in white, clear, gray, brown or black.

F. Manufacturer

	Fire Stop (Metal)	Fire Stop Plastic	Exterior Sealant	Interior Sealant
1. Tremco	Fyre-shield	Tremstop	Spectrum 2	Spectrum 1
2. 3M	Fire Dam	MPS-21	2000 150	FS-195 FS-195
3. General Electric	----	----	SCS1000	SCS1000
4. Dow Corning	----	----	999A	999A
5. Hilti	FS601	FS611/635	----	----
6. Nelson	CLK	CMP	----	----
7. Pecora	----	----	864	AC-20
8. Rectorseal	Metacaulk 950	Metacaulk 880	----	----

2.09 ESCUTCHEONS

A. For ductwork - Shall be galvanized angle sized to overlap entire opening.

B. For piping - Shall be chrome finished split faced plastic.

C. For multiple pipes or where holes are over large or offset.
1. Utilize pre-painted aluminum sheet fabricated to cover entire hole and seal within 1/4" of the pipe or pipe covering.
2. Holes shall be hole sawed or punched. Holes shall be round.

PART 3 - EXECUTION

3.01 APPLICATION

A. HVAC Pipe:

1. Hanger and support spacing on copper tubing shall be: 5′-0″ maximum for tube 3/4″ and smaller; 8′-0″ maximum for tube 1″ to 1-1/2″; 10′-0″ maximum for tube 2″ and larger.
2. Hanger and support spacing on steel piping shall be: 5′-0″ for 1/2″ and smaller. 8′-0″ maximum for pipe 3/4″ to 1″ and 12′-0″ maximum for pipe over 1-1/4″.
3. PVC propylene glycol pipe shall be supported on a maximum of 7′-6″ centers for 4″ pipe and 5′-0″ centers for ¾″ pipe. Vertical pipe shall be restrained from lateral movement in excess of 1/2″.
4. PVC drain piping 1″ diameter and less shall be supported and restrained on 2′-0″ centers.

C. Hanger Rod:
1. Hanger rod size shall be: 3/8″ for pipe up to 2″ in size and loads up to 360 lbs; 1/2″ for pipe 2-1/2″ to 3″ and loads up to 600 lbs; 5/8″ for pipe 4″ to 6″ and loads up to 900 lbs.

3.02 PREPARATION

A. Coordination with Owner:
1. Do not do noisy work while occupants are present.

3.03 ANCHORS

A. Use anchors in concrete or masonry walls and floors.

B. Drill hole clean of loose material. Install anchor, flush with surface. Size hole in accord to manufacturers' recommendation. Physically test anchor by pulling against it. Loose anchors will not be accepted.

3.04 PIPE HANGERS AND SUPPORTS

A. Utilize hangers in accord to Application paragraphs.

B. Install hangers to provide minimum 1/2″ space between finished covering and adjacent work.

C. Place hangers within 12″ of each horizontal elbow.

D. Use hangers with 1-1/2″ minimum vertical adjustment. Provide lock nuts and washers for hanger rod at all hangers. Provide additional lock nut and washer on clevis hanger cross bolts.

E. Support vertical piping such that it cannot be deflected more than 1/8" from center by hand pressure.

F. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

G. Support riser piping independently of connected horizontal piping.

H. Provide copper plated hangers and supports for copper piping. Provide hard neoprene inserts secured with strut. Insert shall completely cover pipe and match insulation thickness as closely as manufactured standards allow.

I. Locate hangers for pipe movement without disengagement of supported pipe.

J. Provide auxiliary steel to span structure where required. Provide in accord to Paragraph 3.06 below.

K. Secure upper attachment as detailed on the drawings. Provide lock nut and washer on each set screw and hanger rod attachment.

L. Do not use perforated hanger strap.

3.05 SLEEVES, SEALS, FIRESTOPPING & ESCUTCHEONS

A. Provide firestopping at all new penetrations between mechanical room and adjoining “Work out” space.

B. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

C. Where plastic pipe penetrates Mechanical Room walls pack annulus with intumscent putty. Size sleeve in accord to intumescent putty manufacturers.

G. Where steel or copper pipe penetrates Mechanical Room walls use fire stopping caulk between pipe and sleeve.

H. Exterior wall penetrations shall be sealed with colored silicone between pipe and sleeve. Pack interior of sleeve with fiberglass batt.

I. Provide escutcheon on exposed interior penetrations. Secure escutcheons into place with bead of sealant under. Wipe away exposed sealant.

J. The annular area around ducts and pipe which penetrate walls which extend continuously to the roof deck but which are un-rated shall be packed tightly with fiberglass batt, or shall be sealed tightly with caulking.

3.06 AUXILIARY STEEL AND EQUIPMENT SUPPORTS

A. Hanging Equipment and Materials within the Mechanical Room:
1. Shall be supported from tops of steel joists or from the bottom or top of steel beams.
2. Auxiliary steel shall be manufactured strut, rolled steel shapes or schedule 40 steel piping. Strut shall be sized in accord to the manufacturer's literature unless shown otherwise on Drawings. Rolled shapes or pipe supports shall be in accord to the following chart.

3. Auxiliary Steel Chart (Pipe Diameter and Angle Size)

PIPE SIZE	LOAD POUNDS	30″ SPAN	60″ SPAN	90″ SPAN	120″ SPAN
≤ 3″	≤ 474	1″ 1″x1″x1/4″	1-1/2″ 1-1/2″x1-1/2″x1/4″	2-1/2″ 2″x2″x1/4″	3″ 3″x3″x1/4″
4″	586	1-1/4″ 1-1/2″x1-1/2″x1/4″	1-1/2″ 2″x2″x1/4″	2-1/2″ 3″x3″x1/4″	3″ 3″x3″x5/16″

B. Duct support in the Natatorium and the natatorium ceiling space shall be as detailed on the drawings.
B. Equipment supports shall be as shown on drawings, and specified.

3.07 EQUIPMENT CURBS AND PADS

A. Concrete pads shall be sized to be a minimum of 6″ larger than the length and width dimensions of equipment.

B. Loose roof supports shall be placed on roof as shown on plans and as required to match the spacing specified above.

END OF SECTION 230529

SECTION 230533 – HEAT TRACING FOR HVAC PIPING

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Heat tracing on evaporator/ de-humidifier coil drain piping.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230529 – Supports and Anchors for HVAC.
   2. 230710 – HVAC Pipe and Equipment Insulation
   3. 232113 – Hydronic Piping
   4. 232114 – Hydronic Specialties
   5. 238400 – Package De-Humidifier/AC.

1.03 DESCRIPTION

A. Layout Parameter:
   1. All condensate drain pipe including “P-trap” which is located outside the inner wall of the building shall be traced.

1.04 REFERENCES

A. UL 515 - Standard for Electrical Resistance Trace Heating for Commercial Applications
B. CSA C22.2 No. 130-03 (R2013) Requirements for Electrical Resistance Heating Cables and Heating Device Sets.
C. IEEE 515.1 (2012) The Testing, design, Installation and Maintenance Of Electrical Resistance Trace Heating for Commercial Applications.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300. Contractor shall examine submittals furnished by suppliers and determine if submittals are complete an accurate before forwarding them to the A/E. Submittals for this section shall include:
   1. Heating cable data sheet.
   2. Pipe freeze protection design guide.
   3. Installation and operation manual
   4. Data sheet for connection kits and accessories
   5. Controller data sheet and wiring diagram.
   6. Completed system test report.

1.06 QUALITY ASSURANCE

A. Manufacturer shall:
   1. Be ISO-09001 registered.
   2. Provide products consistent with UL 515, CSA 22.2 No. 130-03 and IEEE 515.1 requirements.

B. Installer shall have a complete understanding of the product installation and operation as required by the manufacturer using the manufacturer’s product literature or from training from a manufacturer’s representative.

C. Testing: Self regulating heating cable shall be tested and qualified to show a prospected useful life of 20 years for a freeze protection function.

1.07 WARRANTY

A parts only warranty of two (2) years from substantial completion shall be provided for heating cable, connection kit, thermostats or controllers and accessories. Submit in compliance with Section 016000.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define characteristics not in the written description, the model number shall be modified as required to meet the described requirements.

2.02 FREEZE PROTECTION CABLE

A. Performance- Cable system with 1 inch thick foam plastic pipe insulation described shall prevent freeze of condensate within the pipe at temperatures of -30 degree Fahrenheit and above.

B. Cable type shall be of a self-regulating parallel resistance configuration. It shall be capable of producing a minimum of 5 Watts per linear foot and a maximum of 8 watts per linear foot at 120 volts.

C. Heating element shall be a pair of 16 AWG nickel coated stranded copper wire embedded in a crosslinked conductive polymer core, which varies heat output in response to temperature along its length. Cable shall be able of being crossed over itself without overheating. Provide with manufactured, water tight accessories for field applied electrical connection on one end of cable and termination on the other end. The cables electrical insulation jacket shall be flame retardant modified polyolefin. Outer jacket shall be a modified polyolefin with an ultraviolet inhibitor. Outer jacket shall be printed with cable model number, agency listings, batch number and marks that show length.

D. Connector kits shall be rated NEMA 4X. All components shall be UV stabilized. Connection shall not require cutting into heater cable core to expose the Buss wires and make connections

D. Acceptable Products:

1. Cable — RayChem XL- Trace series
2. Power Connectors and End Seals — RayChem RayClic

2.03 CONTROLS

A. For Local Control of Exterior Freeze Protection

1. Shall be matched to the cable specified above and shall regulate that cable's heat output proportionately to the temperature differential between ambient temperature and 32 degrees Fahrenheit. (The greater the temperature differential; the greater the heat output)
2. Shall have a range of -40 degrees Fahrenheit to 140 degrees Fahrenheit.
3. Shall be programmable.
4. Shall be able to operate with 120 volts. Shall have an alpha numeric display with a minimum of 6 characters.
5. Shall have self-test function that occurs a minimum of one time in 24 hours.
6. Shall have operational monitoring for high and low temperature, ground fault and current

7. Shall have 2 temperature sensor inputs and sensors for pipe temperature and ambient temperature. Sensors shall be 100 ohm, platinum 3 wire shielded type. Each shall be specifically made for their function.
8. Shall have factory supplied ground fault protection.

B. Acceptable Products

1. Controller	RayChem C910-485
2. Ambient Temperature Sensor	RayChem RTD-200
3. Pipe Temperature Sensor	RayChem RTD-10CS

PART 3 - EXECUTION

3.01 PREPARATION

A. Determine the likely configuration of the exterior drain pipe and trap with the installing contractor. Provide a sketch as to how the cable should match to the pipe.
B. Make sure the metal pipe is free of sharp spots that could damage cable and wire.
C. Determine with electric trade the desired position of the controller and cable wire connections.
D. Work with insulating trade to determine when and how insulation should be installed.
E. Be certain pipe and trap do not leak and that the Engineer will agree with their configuration.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and IEEE 515.1
B. Install terminations and connections where they are protected from abuse and potential damage.
C. Install warning labels on pipe insulation.

3.03 COMMISSIONING AND TESTING

A. Contractor tests:
1. Test cables for electrical continuity at all stages of installation. Replace defective cables.
2. Megger Heating cable at site prior to installation.
3. Megger Heating Cable after installation ; but, prior to insulation work being completed.
4. Megger heating cable after insulation is installed
5. Megger heating cable just prior to being energized at final commissioning.

6. Megger tests noted above shall utilize a minimum of 2500 volts DC. Insulation resistance shall not be less than 1000 mega-ohms at 2500 volts DC.
7. Test cables to verify rating and power input. Measure voltage an current at the same time.
8. Verify with manufacturer all test results are acceptable.

B. Factory Representative verify tests met manufacturer expectations. Provide an executed copy of the factory checklist for the owner’s record.

END OF SECTION 230533

SECTION 230553 - IDENTIFICATION FOR HVAC PIPE AND EQUIPMENT

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Pipe labels.
      b. Equipment labels.
      c. Control wiring labels.
      d. Duct stencils

1.02 RELATED WORK

A. Specified Elsewhere.
   1. 230710 – HVAC Pipe and Equipment Insulation.
   2. 230900 – Temperature Controls.
   3. 232113 – Hydronic Piping.
   4. 232123 – HVAC Pumps
   5. 233100 – Ductwork
   6. 233423 - Fans
   7. 233600 – Air Terminal Units
   8. 237490 – Packaged Dehumidifier-A/C unit

1.03 REFERENCES

A. ANSI B13.1 - Scheme for the Identification of Piping Systems.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300. Submit in a PDF format for Review.

B. Submit list of wording, symbols, letter size, and color coding for HVAC pipe, duct, and equipment identification.

C. Product Data: Provide manufacturers catalog literature for each product required.

D. Manufacturer's Installation Instructions: Indicate special procedures, and installation.

E. Provide a separate line item and cost on the Schedule of Values. For pipe, duct, and equipment identification.

1.05 DESCRIPTION

A. Description- New and newly modified piping and valves and equipment Shall be identified.
B. Definitions

1. Provide means to both Furnish and install.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to

fully define the item. Where model numbers define a single manufactured item, which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved black letters on light contrasting background color. Lettering shall be 1/4″ tall. Placard size shall accommodate message without abbreviation. Placard shall be rectangular. Multiple lines shall be utilized to minimize length to height ratio.

2.03 STENCILS

A. Stencils: With clean cut symbols and letters of following size:
1. Duct of any size: 12″ long color field, 1-1/4″ high letters.

B. Stencil Paint: (Shall be latex enamel colors conforming to application noted below.)

2.04 WIRE LABELS

A. Shall be self adhesive strips with single numbers or letters. Strips shall be vinyl and measures a minimum of 1/4" x 1-1/2″.

B. Background shall be yellow or white.

C. Letters shall be nominally 0.10″.

D. Acceptable Manufacturers:
1. Seton – Wire markers.

2.05 PIPE LABELS

A. Shall have flexible PVC or vinyl backer at either snaps over pipe or is strap-on with draw ties, or glues to itself.

B. Background shall be yellow.

C. Letters shall be nominally 1/2″ for pipe up to 1″; 3/4″ for outside diameters up to 2-3/8″ and 1-1/4″ tall for larger pipe.

D. Acceptable Manufacturers:
1. Brady - Bradysnap/strap-on.
2. EMED - Kwik Coil/wrap-around.
3. Seton - Setmark/markers-on-a-roll.

PART 3 - EXECUTION

3.01 PREPARATION

A. Painted, plastic, paper or rubber surfaces shall be wiped clean. Use solvent as recommended by insulation manufacturer where it applies.

B. Clean wire ends free of lubricants and dirt.

3.02 INSTALLATION and APPLICATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners.

B. Identify HVAC equipment with plastic nameplates. Use names provided by the Owner or as shown on Drawings. Extend sequence of existing names.

C. Tag automatic controls, instruments, and relays. Key to control schematic.

D. Identify piping, concealed or exposed, with wrap around labels. Indicate direction of fluid flow. Use names which match those already in use by Owner. Glycol Pipe labels shall match those shown on the drawings. Install in clear view and align with axis of piping. Locate identification on each side of wall penetrations and near each equipment take off. Locate on minimum of 50’-0” centers on straight runs without branches and take-offs.

E. Label concealed main ductwork with stencils. Connections to diffusers or grilles need no label

F. Identify cabling, concealed or exposed, with markers. Use plan English names like “Main Coil Heating Valve Control”.

END OF SECTION 230553

SECTION 230593 - TESTING ADJUSTING & BALANCING FOR HVAC

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
1. Contractor Provide:
a. Measure air flow in designated branch ducts to verify distribution of supply air throughout the space. Adjust dampers to achieve distribution. Measure air flow at existing and new supply registers, grilles and diffusers.
b. Test and balance new exhaust systems. Verify air flow to EF-1 and EF-2. Adjust fan speed to match required air flow
c. Provide pretest evaluation of new systems shown on drawings. List questions for A/E which may be required before balance work can be completed.
d. Provide retesting required in Paragraph 1.04.D.
e. Test and adjust airflow to new VAV terminal.
f. Obtain temperature measurements across heating and cooling apparatus for heating season.
g. Balance outside air dampers to match that noted on the system schematic.
h. Measure inlet and outlet water temperature at each coil. Measure water flow at each permanently installed flow measuring balance valve.
i. Measure air flow and pressure drop at each reheat coil. Adjust manual dampers and fan speed as required. Provide calibration curve for each reheat coil that relates static pressure across the coil to air flow.
j. Measure fluid flow on fluid cooler. Measure inlet and outlet fluid temperatures.
k. Measure inlet and outlet air temperature and running load amperes of fluid cooler.
l. Provide belts and pulleys needed to change belt driven fan.
m. Measure motor current and voltage at each pump. Including the pump packaged with the AHU unit.

1.02 RELATED WORK

A. Specified Elsewhere:
1. 232123 - Pumps.
2. 232114 – Hydronic Specialties.
3. 230900 - Temperature Controls.
4. 233100 - Ductwork.
5. 233300 – Air Duct Accessories.
6. 233400 - Fans.
7. 233600 – Air Terminal Units.
8. 233713 – Diffusers, Registers and Grilles.
9. 237490 – Packaged Dehumidifier/ AC unit.

1.03 SYSTEM DESCRIPTION

A. Summary:
1. Test and Balance shall:
a. Verify airflow in natatorium.
b. Distribute air around to supply diffusers and registers.
c. Verify air flow is reaching windows, ceiling areas and walls.
d. Verify duct does not leak and that fans and equipment are functioning per design and manufacturer’s performance data.

e. Verify fluid flow to coils.
f. Verify loads on fluid cooler units.
g. Leave the user with a functioning system.

B. Definitions:
1. Air balance - testing and adjusting air system components to achieve design parameters or to evenly distribute available air. Includes both flow and temperature measurements recording of measurements, and adjustment of system to achieve specified air flows.
2. Calibration - Comparison of the measured values of an instrument with a known quantity.
3. Testing - measurement of temperatures, gas flow, electric current and voltage which show how much work an air conditioner is doing or how much heat a furnace is providing.

1.04 QUALITY ASSURANCE

A. Firm shall have personnel certified in accord to one of the standards referenced under REGULATORY REQUIREMENTS or shall be a registered professional Engineer experienced with this type of work.

B. Personnel doing work on site shall have certifications noted above.

C. Instrumentation used for testing and balancing shall be calibrated no more than one month before date of use.

D. Owner and Architect/Engineer reserve the right to pick ten different measurements to be remade after the test and balance report is submitted. If five of the ten selected measurements are found to be more than 50 percent different than those submitted in the report the entire balance report shall be redone.

E. Payment for at least twenty percent balance work will not be made until building has been turned over to the User Contractor will not be paid for report submittals which contain acceptable balance reports for fans later found to be running backwards or similarly obvious problems. Payment will not be made for final reports which simply list problems without also considering solutions.

F. The A/E will compare measured fan characteristics against the manufacturer’s published fan curves and tabulated data. Test data which falls outside of the manufacturer’s published curves may require retesting subject the A/E review.

1.05 REGULATORY REQUIREMENTS AND STANDARDS

A. AABC - National Standards for Total System Balance.

B. ADC - Test Code for Grilles, Registers, and Diffusers.

C. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.

D. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

E. SMACNA - HVAC Systems Testing, Adjusting, and Balancing.

F. SMARTA - Sheet Metal, Air Conditioning and Roofing Contractors Trade Association of Illinois.

G. TABIC - Testing and Balancing Institute for Certification.

1.06 SUBMITTALS

A. Submit name and qualification certificate of air balance technician who actually does work. Do this at least ten working days before work is to be done.

B. Test Reports: Indicate data on standardized form following AABC. SMACNA, SMARTA or TABIC.

C. Provide written certification from installing contractor’s systems are in correct working condition and ready for test.

D. Field Reports: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

E. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Submit locations of proposed traverse measurements.

F. Submit draft copy of report in a PDF format for review prior to final acceptance of Project. Provide revised report as a PDF. Provide final reports as part of the O&M. Provide for letter size, three-hole binder manuals, complete with cover and index pages.

G. Submit cost of balance work as a line item on contractor’s schedule of values. Provide name of balance contractor that time.

H. Include detailed procedures, agenda, sample report forms prior to commencing system balance.

1.07 PROJECT CONDITIONS

A. Building/Construction Conditions:
1. All portions of systems shall be complete before balance work is begun. Ceilings shall be in place. Grilles and diffusers shall be in place.

B. Ambient Conditions:
1. Temperature measurements across de-humidification coils shall be made when ambient temperatures are 50 degrees F or greater.
3. Temperature measurements across heating coils shall be made when ambient temperatures are 75 degrees F or less.

1.08 SEQUENCING

A. Do not do work until systems are complete.

B. Work with temperature installer to balance devices under all operational sequences.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Not Used.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place.
   5. Duct systems are clean of debris.
   6. Fans are rotating correctly.
   7. Volume dampers are in place and open.
   8. Air coil fins are clean.
   9. Access doors are closed, and duct end caps are in place.
   10. Air outlets are installed and connected.
   11. Duct system leakage is minimized.

B. Submit field reports immediately by telephone, email or facsimile. Report defects and deficiencies noted during performance of services which prevent system balance. Do not report defects and deficiencies in written reports except as preliminary situations for which remedies were found.

C. Beginning of work means acceptance of existing conditions.

3.02 PREPARATION

A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

B. Provide additional balancing devices as required.

3.03 FIELD QUALITY CONTROL

A. Air Handling Systems: Adjust to within plus or minus five (5) percent of design.

3.04 ADJUSTING

A. Ensure recorded data represents actual measured or observed conditions.

B. Permanently mark settings of dampers, valves, and other adjustment devices allowing settings to be restored.

C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

D. Leave systems in proper working order, replacing covers, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

E. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

3.05 AIR SYSTEM PROCEDURE

A. Adjust air handling and distribution systems to provide design supply, return, and exhaust air quantities.

B. Use a velocity traverse of branch ducts that serve the following locations. Location of the traverse shall be at the Contractor’s option;

but shall be accessible from the floor and shall meet the published standards for velocity traverse measurement. (See suggested locations on Drawings)

1. At each exhaust drop to the floor.
2. Upstream or downstream of each reheat coil.
3. Between Tee and first diffuser on cross duct.
4. On existing North most 38“diameter duct above low ceiling space, North of the lap pool.
5. On the existing 38” South duct just East of where it connects to the new 40/38 duct.
6. On the 16/15 duct East of the cross duct.
7. 0n the 34/38 duct East of the 40/38 elbow.

C. Adjust distribution system to maximize air motion on the ceiling, walls and windows.

D. Vary total system air quantities by adjustment of fan speed and branch volume dampers. Provide drive changes required. Vary branch air quantities by damper regulation.

F. Measure external static air pressure conditions on air supply units and exhaust fans. Measure static pressure across heating coils. Relate that for preliminary and final measurements.

3.06 WATER AND GLYCOL WATER SYSTEM PROCEEDURES

A. Heating Coils and Fluid Cooler:
1. Measure fluid flow at tapped balance valves.
2. Measure fluid temperature drop or rise across coils and fluid cooler.

3.07 TESTING AND BALANCING

A. Motors:
1. Check and record full load amperes.
2. Report any motors which are overloaded, defective, or operating within their service safety factor.

B. At Fans:
1. Measure:
   a. Air flow.
   b. Total static pressure.
   c. RPM.

C. Pumps:
1. Measure:
   a. Fluid flow.
   b. Suction and discharge pressure.
   c. Voltage.
   d. Amperes.
2. Calculate pump capacity; correct for density changes from standard conditions.

D. Fluid Coolers:
1. Measure:
   a. Inlet and outlet water temperatures of coils.
   b. Inlet and outlet pressures of coils
   c. Fan current draw.
   d. Ambient temperature intake.
   e. Discharge air temperature.

E. Coils:
1. Measure water flow at tapped balance valves.
2. Measure water temperature drop or rise across coils.

3.08 REPORTS

A. Report forms:
1. Title Page:
a. Project name and location.
b. Name of test and balance technician.
c. Report date.
2. Summary Comments:
a. Final performance.
b. Notable characteristics of system.
c. Nomenclature used throughout report.
d. Test conditions.
3. Instrument List:
a. Instrument.
b. Manufacturer.
c. Model number.
d. Serial number.
e. Range.
f. Calibration date.
4. Electric Motors:
a. Manufacturer.
b. Model/Frame.
c. HP/BHP.
d. Phase, voltage, current, both nameplate and actual.
e. RPM.
f. Service factor.
g. Starter size, rating, heater elements.
5. Air Moving Equipment:
a. Location.
b. Manufacturer.
c. Unit number.
d. Air flow- specified and actual.
e. Outside air flow, specified and actual.
f. Total static pressure across fan.
g. Total external static pressure across air handling unit.
h. Airside static pressure drop across coils. Sheave Make/Size/Bore.
i. Fan RPM.
j. Current Loading (AMPS) of Motor.
6. Exhaust Fan Data:
a. Location.
b. Manufacturer.
c. Unit number.
d. Air flow- specified and actual.
e. Total static pressure specified and actual.
f. Sheave Make/Size/Bore.
g. Number of Belts/Make/Size.
h. Fan RPM.
i. Current loading of motor.
7. Fluid Cooler
a. Unit number and use.
b. Ambient inlet temperature.
c. Discharge temperature.
d. Liquid flow through cooler.
e. Liquid flow pressure drop across cooler.
f. Voltage and electric current at each fan and for entire assembly.

END OF SECTION 230593

SECTION 230710 – HVAC PIPE AND EQUIPMENT INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Insulation of heating water piping.
      b. Insulation of heating water pumps.
      c. Insulation of PGS pipe within the envelope of the building.
      d. Insulation of condensate drain pipe outside of the building

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230529 - Supports and Anchors For HVAC.
   2. 230533 – Heat Tracing for HVAC Piping
   2. 230553 – Identification For HVAC Pipe and Equipment.
   3. 232113 - Hydronic Piping.

1.03 SYSTEM DESCRIPTION

A. Definitions:
   1. Heating water pipe includes branch mains and equipment run-outs.
   2. PGS and PGR pipe includes supply and return pipe between the Package Dehumidification/ AC unit and its fluid cooler. It contains a mixture of Propylene glycol and water. The flow of fluid in PGS pipe is from the fluid cooler to the Packaged Humidifier/ AC Unit.
   3. Condensate drain pipe is that which carries condensed water vapor away from the drain pans of cooling and de-humidifier coils.

B. Description:
   1. Heating water pipe is being revised in the Mechanical room to connect to the new Re-heat coils. It shall be covered per this specification.
   2. PGS pipe shall be covered to prevent condensation on the pipe when liquid flow from the fluid cooler is at a lower point than the dewpoint temperature of air within the building.
   3. Condensate drain pipe outside the building requires insulation to minimize the amount of energy needed to keep the temperature of the drain pipe above freezing.

1.04 QUALITY ASSURANCE

A. Material shall have UL listings stamped on material or packing containers.

B. Inspect finished insulation to assure specified tolerance is met. A/E will verify. If A/E notes tolerances are exceeded, entire system shall be re-inspected and corrections made.

1.05 REGULATORY REQUIREMENTS

A. ASTM C165 – Standard Test Method of Measuring Compressive Properties of Thermal Insulation.

B. ASTM C177 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.

C. ASTM C302 – Standard Test Method for Density and Dimensions of Preformed Pipe-Covering-Type Thermal Insulation.

D. ASTM C356 – Standard Test Method for Linear Shrinkage of Preformed High Temperature Insulation Subjected to Soaking Heat.

E. ASTM C411 – Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.

F. ASTM C534 - Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

G. ASTM C421 – Standard Test Method for Tumbling Friability of Preformed Block-Type and Preformed Pipe-Covering-Type Thermal Insulation.

H. ASTM C447 – Standard Practices for Estimating the Maximum Use Temperature of Thermal Insulations.

I. ASTM C547 - Standard Specification for Mineral Fiber Preformed Pipe Insulation.

J. ASTM C585 – Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing.

K. ASTM C665 – Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

L. ASTM C871 – Standard Methods for Chemical Analysis of Thermal Insulation Materials for Leachable Chloride, Fluoride, Silicate, and Sodium Ions.

M. ASTM C1104 – Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.

N. ASTM C1136 – Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.

O. ASTM C1335 – Standard Test Method for Measuring Non Fibrous Content of Man Made Rock and Slag Mineral Fiber Insulation.

P. ASTM C1338 – Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facing.

Q. ASTM D774 – Standard Test Methods for Bursting Strength of Paper.

R. ASTM D5116 – Standard Gide for Small Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

S. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology)

T. ASTM 6196 - Standard Practice for Selection of Sorbents, Sampling, and Thermal Desorption Analysis Procedures for Volatile Organic Compounds in Air

U. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

V. ASTM E96 - Water Vapor Transmission of Materials.

W. ASTM E119 – Standard Test Materials for Fire Tests of Building Construction and Materials.

X. ASHRAE 90-1-2019 - Energy Efficient Design of New Buildings Except Low Rise Residential Buildings.

Y. IECC 2018 – International Energy Conservation Code

1.06 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide product description, list of materials and thickness for each service, and locations. Show compliance with all specified standards. Show K-Value, maximum temperature, permeability, surface burning characteristics, flame spread and smoke density. Provide MSDS sheets for adhesives and paints. Show material is asbestos free. Submit product data for covers and accessories.

C. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.

D. Provide the name of the installing contractor and line item cost of all pipe insulation work on the Schedule of Values.

1.07 QUALIFICATIONS

A. Installer: Workman skilled in performing the work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density fire ratings and thickness. Keep separated.

B. Store insulation in original wrapping and protect from weather and construction traffic.

C. Protect insulation against dirt, water, chemical, and mechanical damage.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

1.10 SPARE MATERIALS

A. Items Required:

1. Provide 2-3 foot lengths of each diameter pipe covering used for each material used.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers listed define characteristics not included in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 FIBERGLASS

A. Shall conform to ASTM C547 Type 1. K-value shall be no more than .23 BTU/hr/in degrees F. Material shall be rated for temperatures up to 650 degrees F.

B. Vapor barrier shall be fiberglass reinforced foil faced scrim craft paper. Jacket permeance shall be limited to .02 perm.

C. Flame spread shall be no more than 25. Smoke developed rating shall be no more than 50.

D. Accessory elbow covers shall be .02" thick PVC with flame spread and smoke developed ratings as noted above. Accessory hard covers shall be of same material as noted for elbows. Provide with self sealing closure strip.

E. Insulation shall be premolded to thickness listed in application table. Vapor barrier shall have pre-glued adhesive strips. If staples are required by the manufacturer, the system shall include a vapor barrier cover for the staples.

F. Acceptable Products:

		INDOOR INSULATION
1.	Knauf	1000/ASJ-SS
2.	Schuller	Micro-Lok
3.	Owens-Corning	SSL-II

2.03 CELLULAR FOAM

A. Insulation: ASTM C534; flexible, white colored cellular elastomeric, molded tube.
1. K Value: ASTM C177 .28 at 75 degrees F.
2. Minimum Service Temperature: - 40 degrees F.
3. Maximum Service Temperature: 220 degrees F.
4. Maximum Moisture Absorption: ASTM D1056; 3.0 percent pipe by volume, 6.0 percent sheet by volume.
5. Moisture Vapor Transmission: ASTM E96; 0.20 perm inches.
6. Maximum Flame Spread: ASTM E84; 25.
7. Maximum Smoke Developed: ASTM E84;50.
8. Connection: Waterproof vapor barrier adhesive.

B. Acceptable Products:

1.	Armstrong	AP Armaflex.
2.	Johns-Manville	Rubatex.
3.	Hallstead Mitchell	Insul-Tube.
4.	Aeroflex	Aerocel Tube and Sheet.

2.04 REMOVABLE COVERS

A. Quick Latch Type:
1. Shall have asbestos free ceramic fiber insulation 1-1/2" thick. Density shall be 6 lb/cubic foot.
2. Shall have heat, tear and abrasion resistant silicone surfaced fabric rated for temperatures up to 200 degrees.
3. Shall have reinforced grommets, lacing hooks or hook and loop fasteners sewn or glued into the blanket array. Shall be made specifically to cover inline pump bodies and other irregular piped devices which require occasional service. It shall be made to wrap around finished standard pipe insulation installed on either side of the valve or device.

4. Cover Fire/Smoke Performance shall be as defined by ASTM E-84 – Flame spread index shall be less than 23; smoke developed index shall be less than 50.

PART 3 - EXECUTION

3.01 ENVIRONMENTAL CONDITIONS

A. Work shall be done when temperatures are within the limits set by the manufacturer.

3.02 PREPARATION

A. Verify that piping has been tested before applying insulation materials.
B. Verify that surfaces are clean, foreign material removed, and dry.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.
B. Insulated cold pipes conveying fluids below ambient temperature: (PGS)
   1. Maintain vapor barrier, align insulation and seal without gaps.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjacent pipe. Miter angles.
   3. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
   4. Insulate entire system including fittings, and valves.
   5. Seal inserts at strut supports to adjacent insulation.
C. For insulated pipes conveying fluids above ambient temperature: (Heating water supply and return).
   1. Where pipe is exposed insulate in same manner as for cold pipes, except that valves and unions 2″ and smaller need not be covered.
D. Provide galvanized shields at all pipe hangers.
E. Finish insulation at supports, protrusions, and interruptions.
F. For condensate drain pipe; install after heat tracing has been installed. Cover all surfaces including fittings and traps. Allow insulation to compress around heat tracing cable. Re-enforce connections with nylon wire ties.
G. All joints shall be made with adhesive. Raw edges shall not be exposed except for overlaps. Do not use tape on closed cell foam insulation.
H. Paint closed cell foam insulation exposed to weather with two coats of Ultra-violet resistant paint.
I. Attach removable insulation with fasteners exposed for easy access.

3.03 PIPING SYSTEMS APPLICATION

		INSULATION TYPE	PIPE SIZE	THICKNESS Inch
				Inch
A.	Heating Water Piping	Fiberglass	up to 1-1/2″ 2″ and larger	1″ 2″
C.	PGS Pipe	Fiberglass	Up to 4″	1/2″
D.	Heating Water Pump Bodies	Removable Insulation	N/A	1″
E.	Condensate Drain Pipe Including trap and Clean Out	Foam Plastic	Up to 2″	1″

3.05 FIELD QUALITY CONTROL

A. No gaps will be allowed in cold pipe insulation. No more than 1-12" x 1/16" gap per 100 feet of insulated hot pipe will be allowed.

END OF SECTION 230710

SECTION 230720 - HVAC DUCTWORK INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Insulation on new supply air ductwork in the mechanical room.
      b. Re-insulation of existing duct where connections are made.
      c. Insulation of the patch made to the existing make up air duct. See drawings.
      d. Insulation of Re-Heat coil frames and exposed tubing bends.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 233100 - Ductwork.

1.03 SYSTEM DESCRIPTION

A. Definitions:
   1. Supply air ductwork is all duct which is downstream of the AHU. coils.
   2. Round duct is that duct with a round or oval cross-section.
   3. "Exterior" means outside the envelope of the building exposed to the elements.
   4. Outside air ductwork is make up air duct. It connects louvers to equipment.

B. Description of work:
   1. Exterior ductwork shall be as specified in 233100. It shall not require further field applied insulation.
   2. Supply duct in the mechanical room and patches on main makeup duct shall be covered with blanket insulation.

1.04 QUALITY ASSURANCE

A. Materials shall be stamped with ASTM and UL listings.

B. Inspect to be certain tolerance are met. A/E will verify. If tolerance are not found to be met at any one part of the system the entire system shall be re-inspected.

C. Installer: Workman skilled in performing the work of this section.

1.05 REGULATORY REQUIREMENTS

A. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

B. ASTM C553 - Mineral Fiber Blanket and Felt Insulation.

C. ASTM E84 - Surface Burning Characteristics of Building Materials.

D. ASTM E96 - Water Vapor Transmission of Materials.

1.06 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Provide product description, list of materials and thickness for each service, and locations. Show compliance to referenced standards. Show K-Value, density, permeability flame spread, and surface burning characteristics. Provide MSDS data on all adhesives and cleaners. Show accessories will match insulation.

C. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.

D. Provide a separate line item and cost on the Schedule of Values for Duct Insulation. Value shall match sub-contractor lien waivers.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 016000.

B. Deliver materials to site in original factory packaging, labeled with manufacturer's density and thickness. Keep materials separated until installed or removed from site.

C. Store insulation in original wrapping and protect from weather and construction traffic.

D. Protect insulation against dirt, water, chemical, and mechanical damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 GLASS FIBER

A. Composite Surface Burning Characteristics by UL 723:
1. Flame Spread - 25.
2. Smoke Developed - 50.

B. Flexible Insulation: flexible, non-combustible blanket:
1. K value: ASTM C518, .27 at 75 degrees F.
2. Maximum service temperature: 250 degrees F.
3. Maximum moisture absorption: less than three percent by volume.
4. Kraft paper reinforced vapor barrier jacket with glass fiber yarn bonded to aluminized film. Limit moisture vapor transmission to .04 permeability.
5. Density 1.5 lb./cubic foot.

C. Vapor Barrier Tape:
1. Compatible with wrap submitted.
2. Premium grade foil fiberglass scrim and kraft paper laminate in diamond pattern with high tack adhesive. Shall be able to conform to irregular surfaces. Backing shall conform to UL Standard 723.

D.	Acceptable Products:	Flexible
1.	Certainteed.	Duct wrap
2.	Knauf.	Duct wrap
3.	Schuller.	Microlite
4.	Owens Corning Fiberglas.	Type 100

PART 3 - EXECUTION

3.01 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
B. Maintain ambient temperature limits during and after installation for minimum period of two hours.

3.02 PREPARATION

A. Remove construction dirt and dust from duct to be insulated before insulation work is done.

B. Verify duct has been sealed and leak tested.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Insulated ductwork conveying air below ambient temperature: (supply duct)
1. Provide insulation with vapor barrier jackets.
2. Finish with vapor barrier tape of the highest quality specified.
3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
4. Insulate entire system including fittings, joints, flanges, and flexible connections.

C. Blanket insulation shall be wrapped tightly around circumference of ductwork and coils. Edges shall be lapped and stapled. Circumferential joints shall be taped. Horizontal supports shall be covered. Vertical supports shall be taped tightly to the insulation where they penetrate.

3.04 APPLICATION

DUCTWORK	THICKNESS Inch	FINISH
A. Mechanical Room Duct And Reheat Coils	1-1/2″ Blanket	Vapor Barrier Specified

END OF SECTION 230720

SECTION 230900 - TEMPERATURE CONTROLS

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Sensors and controls to operate the Variable Air Volume box in the equipment room.
      b. Interconnection of manufacturer supplied controls and required control sequence for the Package De-Humidifier and its fluid cooler and pump and the monitoring and control of that system with the building energy management system
      c. Integration, expansion and upgrade of existing computer software and hardware required to operate the expansion and changes to the HVAC controls in the RiverPlex Building.
      d. Software and hardware design to provide sequence of operation herein specified for the new systems.
      e. Sensors, transformers, and controls to operate the zones of hot water reheat coils (valves and pumps that serve the Therapy Pool, Whirlpool and Lap and Leisure Pools
      f. Control and monitoring of new exhaust fan operation.
      g. Miscellaneous assorted control connections and wiring and devices (including 24 volt transformers and their primary and secondary wiring) to make system function.
      h. All wire conduit tubing and cable required to complete systems.
      i. Removal of existing controls.
      j. Commissioning and startup of control systems and the equipment they control for the equipment specified.
      k. Owner and user training for the revised control systems serving new equipment.
      l. Monitoring of the operation of the heat trace cabling.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230593 - Testing, Adjusting Balancing for HVAC.
   2. 232123 - Pumps
   3. 233423 - Fans.
   4. 233600 - Air Terminal Units.
   5. 237490 – Packaged Dehumidifier/ AC Unit

1.03 REFERENCES

A. ANSI/NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

D. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilation Systems.

1.04 SYSTEM DESCRIPTION

A. Definition:
   1. Temperature Control – Temperature Control Subcontractor.
   2. Using Agency = PPD Peoria Park District

B. The Temperature Control system at the RiverPlex is a Carrier system being upgraded with an Automated Logic system. All New control work in the

RiverPlex building shall be accomplished by the Peoria control firm ECSI using Automated Logic hardware and software.

C. It is the intention of this specification all controls systems shall work. They shall be provided with all necessary devices, software and labor required to provide the specified “Sequence of Operation”.

1.05 SUBMITTALS

A. Submit under provisions of PPD Submittals Section. Submit evidence of coordination between The Dehumidifier Manufacturer and ECSI.

B. Shop Drawings: Indicate complete operating data, system drawings, wiring diagrams, and written detailed operational description of sequences.

C. Product Data: Include description and engineering data for each control system component. Include sizing as requested.

D. Operation and Maintenance and Training Data:
   1. Submit Training curriculum prior to training meeting. Submit in PDF Format. Include aspects of:
      a. Changing setpoints and schedules.
      b. Accessing menus and controls though passwords and combination of pushing buttons.
      c. Highlighted sections of Owner training and installation that apply specifically to facility devices served.

E. Schedule of Values:
   1. Shall list the name of the business entity whose employees actually perform the work listed in this section.
   2. Separate line items with applicable costs shall be listed for each of the following:
      a. Submission of shop drawings and product data.
      b. Software programming labor/programming of package thermostat controls.
      c. Material and equipment costs.
      d. Installation labor of materials and equipment.
      e. Startup/commissioning of control systems.
      f. Training of Owner's personnel and preparation of training materials and maintenance manuals.

1.06 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of PPD specifications.

B. Accurately record actual location of control components, including safety devices, thermostats, and sensors.

C. Revise shop drawings to reflect actual installation and operating sequences.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of PPD specifications. Submit review copy in a PDF format.

B. Include systems descriptions, set points, and controls settings and adjustments.

C. Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.

D. Format and Content:
1. The manual shall include data for only those controllers and systems actually installed. Manufacturer's standard publications shall be highlighted to reflect the system actually used and Noted to show which systems, controllers and equipment are not actually used. A cover sheet or sheets which define the correct equipment is acceptable but does not fill the requirements noted above for noting and highlighting.
2. The final manual shall be 8-1/2" x 11" paper size and shall be bound into an 8-1/2" x 11" folder.
3. There shall be a separate section for each type of equipment. Equipment names used for the work shall be noted on maintenance manuals.

1.08 OWNER INSTRUCTION AND COMMISIONING

A. System Operation:
1. Controls and equipment which is controlled shall be fully operational and tested by the respective trades which installed the devices. Corrective work shall be performed. Contractor shall review work of all related trades. Work like “bumping” motors, energizing controls, opening valves to determine if systems will function shall be completed. Notify equipment installers of non-functioning items. This shall be done prior to substantial completion.
2. Contractor shall list schedule items required from the Owner/Using Agency so that programming can be completed. Allow a minimum of one week for the Owner/Using Agency to provide this schedule.
3. Obtain from the Owner/Using Agency a list of those individuals who are authorized to provide schedules to the contractor and to receive instructions regarding system operation.

B. Owner Instruction:
1. Instruction shall be provided on at least two separate times with a one-week minimum period between.
2. Provide a sign-up sheet for all personnel who attend training sessions.
3. Notify the Owner/ Using Agency at least two weeks before instructional sessions are needed. Coordinate instructional time at Owner’s/User’s convenience during normal workday.
4. Simply telling whom ever of the Owner’s/User’s personnel who may be on site when the hardware installation is complete does not meet this specification.

C. Training Material:
1. Shall include description of each operating mode of the system.
2. Shall include a glossary of terms which are particular to the project and operation of the systems.
3. Shall include troubleshooting potential problems.
4. Shall include photographs and drawings of the systems as they are actually installed.
5. Shall utilize the same identification symbols as actually installed.
6. Shall include instruction in reading control shop drawings.
7. Shall cover routine maintenance. Provide separate reproducible check lists for daily, weekly, monthly, and yearly maintenance.
8. Include name and telephone number of trained individual who will answer questions on the project.

D. Training Medium:

1. Provide instruction in written form and PDF format. Supply at least one printed copy for use by the Using Agency. Add to this the number of copies needed for the Contractor.
2. The booklet shall be made in the English Language.

1.10 QUALIFICATIONS

A. Installing Contractor: Shall be ECSI

1.11 SEQUENCING AND SCHEDULING

A. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.

B. Coordinate work and ensure system is completed and commissioned by Date of Substantial Completion.

C. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.

1.12 WARRANTY

A. Provide one year warranty for all parts and labor beginning with the date of substantial completion.

1.13 COORDINATION

A. Temperature control system protocol, sequence of operation and points lists designations shall be carefully coordinated with that provided by VAV Box and Package Dehumidifier / AC manufacturers

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured device, which does not include the items included in the written description, the model number shall be modified as required to meet the described requirements.

2.02 COMPOSITE SYSTEMS

A. Systems shall consist of direct digital controllers integrated with electronic sensors and electric/electronic operators.

B. Systems shall be complete with separate zone controls and sensors for each heating water coil and associated pump and control valve. Provide a separate control for the VAV box.

C. Systems shall have full intercommunication between device controllers with central monitoring, adjustability, and program adjustment. Systems shall utilize controllers which are BAC net based. Controllers shall be adjustable through their software to provide the Sequence of Operation listed below. Systems shall have graphics programs which show all primary equipment and their associated valves and dampers. The VAV shall its own graphic representation.

D. Wiring shall be in accord to Division 26, except that plenum rated low voltage multi-conductor cable shall be used above ceilings and within wall cavities. Cable for electric signal shall be no less than 18 gauge. Cable for electronic signal shall be shielded and acceptable to the control system manufacturer. Jacket color shall not be red and shall match the colors of existing low voltage temperature control wiring.

2.03 SENSORS

A. Sensors shall have analog output for input to direct digital controller. Sensor and lead shall be moisture, humidity, temperature, and sunlight resistant.

B. Sensors shall be provided with enclosures as required to shield them against extraneous inputs. i.e., sunlight on a temperature sensor.

C. Sensor supports shall be corrosion resistant and shall hold the device at the location noted by the control manufacturer as the most effective location for the work to be accomplished.

C. Electronic Sensors:
1. Shall have the ability to sample space temperature, space humidity and space carbon dioxide as noted below.
2. Shall be addressable and shall support daisy chain connections.
3. Shall have a communication port.
4. Pool space sensors shall have temperature, humidity, and carbon dioxide sensor capability.
5. Shall have display which shows space temperature and carbon dioxide, humidity and set points as applicable.

D. Carbon Dioxide Sensors:
1. Shall be mountable within the same enclosure as temperature sensor.
2. Shall operate continuously without a local set point control.
3. Shall operate with non-dispearsive infrared technology repeatable to within ± 20 parts per million over a 0 → 2000 parts per million range.
4. Shall be adaptable for duct mounting.
5. Shall have a 4 to 20 miliampere, 0-5 volt or 0-10 volt output for interface to control system.
6. Shall operate with a 24 volt input with a maximum current draw of 100 milliamps.

E. Current Transformers:
1. Shall be able to measure current of equipment being monitored by controller.
2. Shall fit within a stand electric junction box.

2.04 CONTROLLERS

A. Shall be stand-alone type with communication to central unit through communications buss.

B. For VAV box shall include operator and controller as one device. Provide with mounting brackets, mounting hardware for slipping over VAV box shaft, terminals to accept VAV control inputs, terminals for power, sensor, and communication input.

C. For Dehumidifier/ air conditioning units shall be supplied by the Dehumidifier/ AC manufacturer.

D. Electric Line Voltage Thermostats.
1. Shall fit standard 2″ x 4″ electrical box.

2. Shall have SPDT switch action.
3. Contacts shall be rated for an 8 ampere inductive load minimum at 120 volts.
4. Range shall be 50 to 80 degrees F minimum.
5. Shall have visible thermometer.

E. Acceptable Products: Line Voltage
1. Honeywell T6051
2. Penn T26T

2.05 CONTROL VALVES

A. Heating water valves for VAV coils shall be a ball type with a 3-way mixing pattern. Body shall be bronze with union end connections. Actuator shall be 24 volt, removable from the valve and fully enclosed. It shall have a lever for manual opening. Stem shall be stainless steel. Body shall be rated for 212 degrees F and a minimum of 125 psi. It shall be modulating type held in place by its signal and spring wound to return to a normally position upon electrical failure.
1. Belimo series acceptable.

2.06 CONTROL TRANSFORMERS

A. Shall be foot mounted open core configuration with hub connection on primary side. Primary shall be 120 volts and secondary shall be 24 volts It shall be rated for 100 or 200 VA minimum as the VAV load requires. Fuse appropriately on both primary and secondary sides.

2.06 SEQUENCE OF OPERATION AND PECULIAR INSTALLATION NOTES

A. VAV Box Operation: (Mechanical Room)

1. General Background Reasoning: The Existing mechanical room serves multiple existing air supply units which serve the South end of the building. The mechanical room serves as a return plenum for those multiple air handling units. It has been learned over time the capacity of some units is not sufficient to accommodate the spaces they serve. It has also been found the removal of a duct access door on the discharge side of AHU-4 will help alleviate this cooling shortage. The installation of the VAV box is to automate the “band-aid” solution supplied by removing the access door until resizing and replacement of the existing cooling equipment and scheme can be affected.

2. Cooling Mode: (Mechanical room)

a. Valve damper shall modulate between minimum open position and full open position to maintain 75 degree set point in the mechanical space.

3. Place thermostat on the backside of column adjacent to AHU 4; away from the VAV discharge.

B. Zone Re- Heat Coils for Therapy pool, Whirl pool and lap/ Leisure Pool Spaces.

1. Air Flow through coils shall be constant.

2. Valves shall position to maintain air temperature in space at 86 degrees F during occupied periods and a maximum of 60 percent relative humidity at all other times when what is present in the pools. See Sequence Description and points list for Dehumidifier /AC unit as described below.
3. Coil pumps shall energize as required when valves are open.
4. Monitor discharge air temperature at the discharge of each zone duct
5. Locate thermostats on interior walls adjacent to the exhaust drops serving the therapy pool, lap pool, and on the column M/5.7 at the whirlpool.

C. Exhaust Fans
   1. Exhaust Fans EF No. 1 and No. 2 shall operate continually when supply fan is operated.
   2. Fan operation shall be monitored through a differential pressure switch or a current transformer. Alarm shall be sent if there is a failure.
   3. Existing floor level fan shall be operated manually for purging functions. Insulated damper shall open first. When damper is open fan shall start. It shall operate for the timed interval selected by the operator. Supply fan operation, within the package unit shall be reduced to match the capacity of the exhaust fans 1 and 2 and the purge fan.

D. Package Dehumidifier: See Section 237490. Control devices are part of specified equipment in that section.

2.07 POINTS LISTS

A. General Description
   1. Provide sufficient points to match requirements of the sequence of operation descriptions noted above.
   2. Points available within the control system of the Package Dehumidifier / AC unit may not all be used in this design.
      a. This design does not utilize pool water heating functions.
      b. This design uses separate exhaust fans which are not part of the package unit.
      c. This design utilizes VFD drives on each supply fan.
      d. This design uses hot water reheat coils which are not part of the package equipment.
      e. This design does not utilize 100 percent exhaust of all supply air for space purge. It needs to de-energize 1 supply fan and slow the remaining fan for purging operations. Purging shall not be automatic. It shall be performed by a trained operator.
      f. Points with asterisk (*) indicate those not part of the specified Package Unit Controller.

B. Room Condition BACnet Points
   1. Return Air Humidity
   2. Return Air Temperature
   3. Return Air Dew Point
   4. Therapy Pool Wall Temperature. (*)
   5. Whirl pool Wall Temperature. (*)
   6. Lap Pool wall Temperature(*)
   7. Room Air Temperature set point for occupied periods.
   8. Room Air Humidity Setpoint for Occupied Periods
   9. Humidity Floating Set Point dependent upon occupation mode
   10. Room Air Temperature set point for unoccupied periods.

11. Room Air Humidity Setpoint for Unoccupied Periods
12. Return Air Temperature over written by lap pool wall temperature input.
13. Return Air humidity over written by lap pool room humidity sensor.
14. Package Unit in space Dehumidification Mode
15. Package Unit in space cooling mode.
16. Hot water re-heat coil is heating the Therapy Pool Space.(*)
17. Hot water heating coil is heating the Whirlpool Space.(*)
18. Hot water heating Coil is heating the lap/Leisure Pool Space.(*)
19. Trained operator can force cooling mode use for a timed period.(*)
20. Trained operator can force heating mode use for a timed period.(*)

C. Supply Air BACnet Points

1. Temperature downstream of evaporator coil
2. Temperature downstream of heat recovery coil
3. Temperature downstream of RH-1 (Therapy Pool)(*)
4. Temperature Downstream of RH-2 (Whirl Pool)(*)
5. Temperature Downstream of RH-3 (Lap/Leisure Pool)(*)
6. Supply Fan 1 VFD enabled
7. Supply Fan 2 VFD enabled
8. Supply Fan 1 speed.
9. Supply Fan 2 Speed.
10. Supply Fan 1 Enabled
11. Supply Fan 2 Enabled
12. Supply Fan 1 VFD Alarm
13. Supply fan 2 VFD Alarm
14. No Air Flow Alarm
15. Dirty Filter Alarm
16. Freeze Thermostat Alarm

D. Outside Air/Exhaust Air BACnet points

1. Outside air Temperature
2. Outdoor air Humidity
3. Outside air temperature at which heat Recovery Pump starts.
4. Return air Temperature at which Purge mode will not be enabled.
5. Economizer Minimum Outside Air Set Point.
6. Supply Air Freeze Thermostat Setpoint at which Outside air Dampers air closed and Exhaust fans are stopped.(*)
7. Outside Air Damper “Open- Closed” Position Indicator
8. Indicator Remote Exhaust Fan 1 is operating.(*)
9. Indicator Remote Exhaust Fan 2 is operating.(*)
10. Manually set purge interval.(*)
11. Exhaust level indicating percentage of supply flow operating for purge activity while EF#1, EF#2 and Purge fan are all operating.(*)
12. Elapsed Purge time in Minutes.(*)
13. “On-OFF” status of Heat recovery Pump
14. Indicator Unit is being used in Purge mode.(*)
15. Command input to start Purge mode for the timed interval.(*)
16. Day time mode of operation schedule.
17. Indicator Freeze thermostat has reached alarm temperature.
18. Alarm Heat recovery Pump is overloaded electrically.

E. Space Heating See Sequence of operation for the reheat coils outside of the Package Unit.

F. Compressor Circuit BACnet Points

1. Refrigerant High Pressure Measurement Compressor 1
2. Refrigerant Low Pressure Measurement Compressor 1
3. Evaporator Temperature Compressor 1
4. Suction Temperature Compressor 1
5. Discharge Temperature Compressor 1
6. Superheat temperature of Compressor 1
7. Stage 1 of Compressor 1 is activated.
8. Stage 2 of compressor 1 is activated.
9. Reheat valve compressor 1 is open.
10. Compressor 1 cooling solenoid valve is open
11. Compressor 1 cooling solenoid valve is closed for pump down.
12. Compressor 1 is available to do refrigeration work.
13. Compressor 1 High pressure alarm
14. Compressor 1 Low pressure alarm
15. Compressor 1 oil failure alarm
16. Compressor 1 High discharge temperature alarm.
17. Compressor 1 High superheat alarm
18. Compressor 1 low superheat alarm
19. Compressor 1 pressure fault alarm. (Too low High or too high low of refrigerant pressure, for operational compressor.
20. Refrigerant High Pressure Measurement Compressor 2
21. Refrigerant Low Pressure Measurement Compressor 2
22. Evaporator Temperature Compressor 2
23. Suction Temperature Compressor 2
24. Discharge Temperature Compressor 2
25. Superheat temperature of Compressor 2
26. Stage 1 of Compressor 2 is activated.
27. Stage 2 of compressor 2 is activated.
28. Reheat valve compressor 2 is open.
29. Compressor 2 cooling solenoid valve is open.
30. Compressor 2 cooling solenoid valve is closed for pump down.
31. Compressor 2 is available to do refrigeration work.
32. Compressor 2 High pressure alarm
33. Compressor 2 Low pressure alarm
34. Compressor 2 oil failure alarm
35. Compressor 2 High discharge temperature alarm.
36. Compressor 2 High superheat alarm
37. Compressor 2 low superheat alarm
38. Compressor 2 pressure fault alarm. (Too low High or too high low of refrigerant pressure, for operational compressor.

G. General Overall Control BACnet Points

1. Summer Cooling High Outdoor air temperature setpoint
2. Percentage of reheat operation of heat recovery.
3. Compressor Pump activity indicator.
4. Compressors enabled for further control instructions.
5. Air Conditioning Cooling Control Enabled for further control instructions of the cooling mode.
6. Emergency Heat Not Required. Boiler water supplies heat.
7. Compressor Pump Overload alarm.

H. Outside Air Fluid Cooler BACnet

1. Temperature of Fluid Entering Fluid Cooler
2. Temperature of Fluid Leaving Fluid Cooler
3. Head Pressure Control indicates percentage of full fan speed.

4. Outdoor Air Fluid Cooler operational indicator for Cooler fan Number 1.
5. Outdoor Air Fluid Cooler operational indicator for Cooler fan Number 2.
6. Fluid Cooler Pump Operational Indicator
7. Outdoor Air Fluid Cooler fan motor over-load alarm.
8. Fluid Cooler Pump Fault indicating low fluid flow.

I. Miscellaneous Item BACnet Points

1. Overall Unit Electrical Power Load measured in Amperes.(*)
2. Maximum time a sensor can be over-ridden without being refreshed again.
3. Indicator of number of alarms which are activated.
4. Indicator of number of alarms of less severity which are activated.
4. Indicator the system is on and capable of controlling the space. That is supply fans are operating, a compressor is ready to operate, No alarms are indicated, it is not in service mode, It is not shutting down, and it has passed the initial start-up phase
5. Outdoor Air Fluid Cooler operational indicator for Cooler fan Number 2.
6. Service mode indicator that unit is in service mode.
7. Indicates Fire Detectors have indicated an Alarm
8. Bad Battery / Bad Mother Board Alarm indicator.

J. Further BACnet Points Requirements

1. Configure unit to be rebooted over the BACnet.
2. Use Package Dehumidifier Interface to reconfigure sensors as required to be enabled.
3. Enable Command Input by assigning input to the building management system then enable the input for use.
4. Over-ride sensors as needed by the sequence of operation. Use interval time function to limit time over-ride is in place.
5. Use either BACnet IP; BACnet over Ethernet or BACnet MS/TP to interface Package Dehumidifier /AC unit with available BACnet configuration.
6. See Package Dehumidifier specifications and instructions for further clarifications and requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that systems are ready to receive work.

B. Beginning of installation means installer accepts existing conditions.

3.02 DEMOLITION

A. For Reuse:
1. Remove existing control instruments carefully.
2. Deliver to the Peoria Park District

B. For Disposal:
   1. Remove existing control instruments. Dispose of in a lawful manner.
   2. Remove tubing, wire and conduit where exposed within space. Abandon conduit, tubing and wire left in walls that are not otherwise demolished.
   3. Disconnect wire at control source and pull from conduits.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Run 24 volt wire in conduit or in a neat manner supported from piping or conduit or structure. Run 120 volt wire in conduit.

C. Locate temperature sensors and thermostats in location noted in the specifications. Mount thermostats with pads and operable levers, dials and buttons no lower than 50" and no higher than 54". .

D. Mount controls adjacent to associated equipment on vibration free walls. Provide engraved plastic nameplates for instruments.

E. Provide junction boxes for wire connections. Wire above accessible ceilings shall be bundled and supported in rings. Bundle wires on 24" center with nylon wire ties. Secure individual wires above ceilings to ductwork or structure. No wire shall rest on ceilings. Provide surface raceways on inaccessible finished wall or ceiling surfaces within occupied spaces. Provide EMT conduit in equipment rooms. Use voids in walls where available.

F. All wire ends shall be labeled and coded to match installation drawings. Wires extending to remote switches and thermostats shall be labeled or coded to indicate line side and switched side.

G. Provide 120/24 volt transformers for VAV box control. Coordinate with Electric trade.

H. After completion of installation, test and adjust control equipment. Submit data showing set points and final adjustments of controls.

I. Provide all software input and troubleshooting to make system work.

END OF SECTION 230900

SECTION 232113 - HYDRONIC PIPING

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Demolition of heating water branch pipe serving the existing Dectron heating water coil.
      b. Reconfiguration of heating water piping to serve the new heating coils.
      c. New PGS and PGR piping to serve the connection between the fluid cooler and the refrigerant condenser which is part of the AHU package.
      d. Condensate Drain Piping between the drain pan on the new unit and an existing drain inside the building.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230529 – Supports and Anchors For HVAC.
   2. 230553 - Identification for HVAC Pipe and Equipment.
   3. 230710 - HVAC Pipe and Equipment Insulation.
   4. 230900 – Temperature Controls
   5. 232114 – Hydronic Specialties
   6. 232123 – Pumps
   7. 237490 – Packaged Dehumidifier/ AC Unit

B. Owner will:
   1. Provide water treatment for heating water.
   2. Assist in shutoff of system to accommodate new connections to heating water system.

1.03 SYSTEM DESCRIPTION

A. New Work Shall:
   1. Revise and extend existing heating water system.
   2. Provide new PGS and PGR piping between the refrigerant condenser in the AHU package and the remote fluid cooler.

B. Definitions.
   1. Heating water supply and return piping convey heating water and from terminal heating units or coils in ductwork or air supply units. Temperatures can range from 140 degrees F to 230 degrees F.
   2. PGS piping is propylene glycol supply piping. PGR piping is Propylene Glycol Return pipe. Temperatures can range from 15 degrees F to 115 degrees F.

1.04 REGULATORY REQUIREMENTS

A. International Mechanical Code 2012.

1.04 REFERENCES

A. ASME B16.3 - Malleable Iron Threaded Fittings.

B. ASME B16.22 - Wrought Copper and Bronze Solder-Joint Pressure Fittings

C. ASME B16.51 – Copper and Copper Alloy Press-Connect Pressure Fittings.
D. ASTM A53/A53M-20 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.
E. ASTM B32-20- Standard Specification for Solder Metal.
F. ASTM B88 – Standard Specification for Seamless Copper Water Tube.

G. ASTM D1784-20 – Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
H. ASTM D1785-15e1 – Standard Specification for Poly Vinyl Chloride (PVC)
Plastic Pipe, Schedules 40,80, and 120.
I. ASTM D2464-15 – Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
J. ASTM D2467-20 – Standard Specification for Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings Schedule 80.
K. ASTM D2564-20- Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
L. ASTM D2855-20 Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC)Pipe and Piping Components with tapered Sockets
M. ASTM F441/F441M-20 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data: Include data on valves, pipe and pipe fittings. Provide manufacturers catalogue information. Indicate valve data and ratings.

C. Submit separate line item prices for heating water piping and valve work and PGS and PGR piping and valve work on Schedule of Values.

1.06 PROJECT RECORD DOCUMENTS

A. Record actual locations of shutoff valves and balance valves.

B. Show re-route of piping concealed above ceiling in detail.

C. Show general re-route of exposed piping.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017823.

B. Maintenance Data: Include installation instructions, space parts lists, exploded assembly views.

1.08 QUALIFICATIONS

A. Certify welders in accordance with American Welding Society or local union requirements.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

D. Protect PVC piping from sunlight.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 HEATING WATER PIPING, ABOVE GROUND

A. Steel Pipe (for sizes 2.5” and larger): ASTM A53 Schedule 40, black.
   1. Fittings: Shall be Class 150 malleable iron fittings meeting ANSI/ASTM A197 and ANSI ASME B16.3, B16.4, B16.39 standards. fittings.
   2. Joints: Threaded or Mechanical grooved coupling.
   3. Mechanical Grooved Couplings: Shall have malleable iron housing clamps to engage and lock. Elastomeric EPDM sealing gasket, steel bolts, nuts, and washers. At contractor’s option fittings shall be ductile iron conforming to ASTM A536 with elastomeric EPDM "o-ring".
   4. Acceptable Products - grooved fittings.
      a. Victaulic HVAC Products
      b. Grinnell Gruvlok

B. Copper Tubing (for sizes 2” and smaller): ASTM B88, Type L, hard drawn.
   1. Fittings: ASME B16.18, cast bronze, or ASME B16.22, wrought copper and bronze.
   2. Joints: ASTM B32-92, solder, lead-free and antimony-free.
   3. Acceptable Products: Solder
      a. Taracorp Tarament Sterling.
      b. Oatey Silver.
   4. At Contractor's option fittings shall be wrought copper press connected type with EPDM "O"-Ring type gaskets. Fittings shall have indicators that verify connections have been made. Fittings shall be rated for operating pressures of 200 psi and temperature ranges of -20 degrees F to 250 degrees F. Fittings shall comply with ASME B16-51.
   5. Acceptable Products:

		Press Fittings	Solder Fittings
a.	Viega	ProPress	--
b.	Mueller	StreamlinePRS	Streamline
c.	Apollo	X Press	--
d.	Nibco	--	WROT/Cast 0198

2.03 CONDENSATE DRAIN PIPE

A. Copper Tubing: ASTM B88, Type L, hard drawn.
   1. Fittings: ASME B16.18, cast brass, or ASME B16.22, solder wrought copper.
   2. Joints: Solder, lead free, ASTM B32, or tin and silver, with melting range 430 to 535 degrees F.

B. Non Pressure PVC Pipe: Solid; not Foam Core, Schedule 40 DWV ASTM D 1785.
   1. Fittings PVC ASTM D 2665
   2. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent supply.

2.04 PGS & PGR PIPE

A. PVC Pipe:
   1. Pipe shall be schedule 80 and meet ASTM Standards D1784 and D1785.
   2. Fittings shall meet ASTM Standards D2464 and D2467.
   3. Adaptors shall be threaded male type.
   4. Joints shall be solvent cement complying with ASTM D2564 and ASTM 2855 for runs over 12" long and threaded where close coupling is required, or valves are installed.

A. Pipe Size 2″ and Under:
   1. Ferrous pipe: 150 psig malleable iron threaded unions.
   2. Copper tube and pipe: Pipe 1-1/4" and smaller shall utilize CPVC solvent welded or threaded standard unions with free-spinning union nuts.

B. Pipe 1-1/2" to 2" shall utilize PVC solvent weld or unions.

C. Dielectric Connections: Brass flange with copper solder end, gaskets, dielectric flange bolt inserts, washers and stainless steel bolts.

A.

2.05 PIPE HANGERS AND SUPPORTS. SEE SECTION 230529.

2.06 UNIONS, FLANGES, AND COUPLINGS

A. Unions for Pipe 2″ and Under:
   1. Ferrous Piping: 150 psig malleable iron, threaded.
   2. Copper Pipe: 150 psig bronze unions with soldered joints and ground connection.

B. Flanges
   1. PVC Pressure Pipe: Pipe 2-1/2" and larger shall utilize PVC "Van-Stone" flanges with solvent weld connections.

2.07 SHUT-OFF VALVES

A. For pipe up to and including 2″:
   1. Ball configuration with bronze two piece body, chrome plated brass full port ball, teflon seats and stuffing box ring, lever handle solder or threaded ends. Provide stem extension for insulated piping.
   2. Valve shall be rated for 600 lb. W.O.G.

B. For pipe 2-1/2" and larger.
   1. Butterfly configuration with cast iron or ductile iron epoxy coated body and full lug connections.
   2. Seat shall be resilient EPDM positioned to secure between body and mating flange.

3. Shaft shall be 416 stainless steel; disc shall be 316 stainless steel.
4. Operator shall be ten position lever type.
5. Valve shall be rated to shut-off bubble tight for end of line “dead end” service against 150 psig without need for downstream flange.

C. Acceptable Products:

	Ball Valves	Butterfly Valves
1. Apollo	Model 77 Series	LD145
2. Milwaukee	Model BA 150/150S	M series
3. Watts	ES-LFB6080 Series	DBF-03

2.08 BALANCE VALVES

A. Calibrated, plug type with precision machined orifice or globe style with parabolic disc, readout valves equipped with integral check valves and gasketed caps, calibrated nameplate and indicating pointer.

B. Acceptable Products: Balance Valve
1. Bell & Gossett Circuit Setter.
2. Taco Circuit Setter.

2.09 CHECK VALVES

A. Swing check valves up to and including 2":
1. Bronze body, bronze trim, bronze rotating swing disc, with TFE disc, solder or threaded ends.
2. Valve rating shall be minimum of 200 lb WOG.

B. Acceptable Products:

	2" and under
1. Apollo	161S/161T
2. Milwaukee	509T/1509T
3. Watts	LFWC Series

PART 3 - EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions except equipment connected with copper pipe shall not utilize unions. Pipe with room left for future use of tubing cutter, torch and slip coupling.

D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

3.02 APPLICATION

A. Heating water pipe shall be copper, or steel as specified to match existing sizes now installed.
B. PGS and PGR pipe and make up pipe from fill pump shall be schedule 80 PVC.
C. Condensate drain pipe outside the building shall be copper so the heat tracing can keep the water inside from freezing. Condensate drain pipe inside the building shall be PVC because there can be a chlorine heavy atmosphere that could corrode copper pipe.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Route piping in orderly manner, parallel to building structure, and maintain gradient. Provide air vents at all relative high points in pipe systems.

C. Install piping to conserve building space, and not interfere with use of space.

D. Group piping whenever practical at common elevations, except where otherwise indicated to simplify air venting and drainage.

E. Sleeve pipe passing through partitions, and walls.

F. Slope piping and arrange to drain at low points, and air venting at high points.

G. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Make runout connections with offsets and swing connections. Avoid anchoring small pipe to large pipe with straight tee connections.

H. Do not utilize "bull headed" tees, "street" fittings or bushings.

I. Reduce horizontal piping sized with reducing tees or eccentric reducer fittings. Eccentric fittings shall be level on top.

J. Pipe reductions in vertical pipe shall be with concentric reducers or reducing tees.

K. Provide air vents at all high points and drops in direction of flow. Vents and valves shall be secured to adjoining pipe or structure. Vents shall terminate so to allow a quart size container beneath them. Use most direct route unless otherwise shown on drawings.

L. Automatic air vents are not specified for this work. No automatic air vents shall be installed in this work without a manual stop valve between them and the system.

M. Ball valves or 1/4 turn gauge cocks shall be utilized for manual air vents.

N. Provide access where valves and fittings are not exposed.

O. Install valves with stems upright or horizontal, not inverted. Butterfly valves shall be installed with stems horizontal, or at 45 degrees to vertical.

P. Install balance valves on the return sides of each coil. Provide a shut off valve upstream of coil array supply and downstream of coil array return.

Q. Copper Pipe:
1. Sweat Solder Joints:

a. Solder shall fully fill annular area between the fitting socket and the pipe. Pipe shall extend fully into the fitting. Fillets shall be wiped smooth.

2. Press fittings shall be made in accord with fitting manufacturer's instruction using tools recommended by the manufacturer. Use press fittings where connections are made to existing systems.

3. Connect steel pipe to copper pipe through a bronze valve for pipe sizes 2″ and under.

R. PVC PIPE

1. Use PVC pipe manufacturer’s recommended primer and solvent weld cement. Follow manufacturer’s instruction implicitly.
2. Use changes in pipe direction and expansion loops as required to accommodate linear expansion of the pipe.
3. Use reducer couplings or a series of bushings to change pipe sizes. Do not use a single bushing to adapt over more than 1 pipe size. (IE adapt from 4″ to 2 inch by passing through 2 inch to 3 inch bushings and 3″ to 4 inch bushings.
4. Do not pressure test PVC pipe with compressed air.

S. CONDENSATE DRAIN PIPE

1. Route from drain pan down through a “P-Trap” below the level of the drain pan. Provide a threaded clean-out port and plug above the “P-trap”. “P-trap” shall be constructed of “long sweep” fittings or with double 45 degree elbows on the inlet side. “P-trap” outlet shall be constructed of either 45 degree or 90 degree fittings. Trap height shall be a minimum of 2.5″ or as noted on the drawings.

3.03 SYSTEM START UP

A. Flushing and Cleaning:

1. Before making final connections to existing pipe flush new pipe.
2. Bypass new connection points at equipment and existing mains fill branch pipe with mixture of water and trisodium phosphate at a ratio of 1 pound per 50 gallons of water. Circulate the mixture so that water volume exchanges places within the pipe at least ten times. I.E., a 4″ pipe 760 feet long contains about 500 gallons of water. A 10 gpm pump will exchange water one full time in 50 minutes so 8:33 hours of time would be required. Drain wash water from pipe and flush with clear potable water until flow runs clean.

B. Filling:

1. Fill system through system manually vent air from high points. Vent air from high points until it is gone.

END OF SECTION 232113

SECTION 232114 - HYDRONIC SPECIALTIES

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Propylene-glycol mix and make-up equipment for AHU’s condenser fluid cooler system.
      b. Pressure gauges for the Propylene-glycol and heating water piping.
      c. Thermal well (Pete’s plug) connectors for the Propylene-glycol and heating water piping.
      d. Air eliminator in the Propylene Glycol piping.
      e. Flexible connections for connection to the AHU and the Fluid Cooler.
      f. Expansion tank for the Propylene glycol system
      g. Start up of new systems including purging of all air.
      h. Balance and relief valves for the propylene Glycol system

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230900 – Temperature Controls
   2. 232113 - Hydronic Piping.
   3. 232123 - HVAC Pumps.
   4. 237490 – Packaged Dehumidifier/AC Unit
   5. 238216 – Air Coils

1.03 REFERENCES

A. ASME - Boilers and Pressure Vessel Codes, SEC 8-D-Rules for Construction of Pressure Vessels.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300

B. Product Data: Provide product data for manufactured products and assemblies required for this project. Include component sizes, rough-in requirements, service sizes, and finishes. Include product description, model and dimensions.

C. Submit a separate line item price for the glycol mix, the glycol mix make up / charging system, the glycol mix expansion tank, and the assorted accessories if they are not supplied by the same entity. The Entity on the submittal shall match the entity on the Schedule of values.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016000.

B. Accept devices on site in shipping containers with labeling in place. Inspect for damage.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 EXPANSION TANKS

A. Manufacturers: See schedule on drawings.

B. Construction: Welded steel, tested and stamped in accordance with ASME SEC 8-D; supplied with National Board Form U-1, rated for working pressure of 125 psig with flexible butyl diaphragm sealed into tank. Provide in a vertical configuration with a ring support for a floor mount.

C. Accessories: Air-charging fitting, tank drain; pre-charge to 5 psig.

2.03 AIR VENTS: See Section 232113.

2.04 AIR SEPARATION:

A. Air Scoop shall:
1. Be of cast iron construction with female MPT tapping for expansion tank connection and 125 lb flanged connections for main fluid flow.
2. Be inline configuration for horizontal mount.
3. Have flow direction and air chamber.
4. Have tapping for air vent and drain.

B. Acceptable Products:

1.	TACO	Air Scoop
2.	Wessels	AP Series

2.05 STRAINERS

A. Size 1/2″ to 2″:
1. Shall be cast brass or bronze construction rated for 200 psig at 150 degrees F. Configuration shall be "wye" type. Strainer shall be 20 mesh stainless steel, and shall be self-cleaning and completely removable. Connections shall be threaded or sweat solder.

B. Size 3″ to 4″:
1. Flanged CPVC body rated for 90 psig working pressure, Y pattern with 8 mesh stainless steel screen.

C. Acceptable Products:

		2″ & Smaller Bronze	2-1/2″ to 4″
1.	Conbraco	59	---
2.	Hoffman	420	----
3.	Stayflow	---	YHF
4.	Metraflex	BSMM	---
5.	Watts	77M1	---

2.06 SPECIALIZED VALVES

A. Balance Valve: Calibrated, plug type with precision machined orifice, readout valves equipped with integral check valves and gasketed caps,

calibrated nameplate and indicating pointer. Provide with drain kit. Provide with solder, NPT or flanged connections as required to mate pipe.

B. Relief Valve: Shall have bronze body with poppet style adjustable relief mechanism. Connections shall be 3/4" NPT. Unit shall have ASME rating.

C. Acceptable Products:

		Balance Valve	Relief Valve
1.	Bell & Gossett	Circuit Setter	790
2.	Taco	ACCU-Flow	333
3.	Wilkens	---	P174A
5.	Watts	CSM-61	174A
7.	Conbraco	---	106 OD Series

2.07 INSTRUMENTATION

A. Pressure gauges shall:
1. Be Bourdon tube liquid filled type accurate within two percent of range.
2. Be constructed with non-ferrous case and bronze and stainless steel movement.
3. Be 9.0 centimeters (3-1/2″) in diameter.
4. Be provided with snubber and shut-off valve.
5. Have 0 to 100 psig range.

B. Test Plugs:
1. Shall be brass or stainless steel construction.
2. Shall have thumb operated shut-off valve.
3. Shall have 1.8″ or 1/4″ male pipe thread.
4. Shall have heat resistant insert gasket sized for allowance of pocket thermometer.
5. Shall have removable gasketed cap.

C. Acceptable Manufacturer’s:

		Pressure Gauges	Test Plug
1.	Weiss	TL	---
2.	Trerice	600C	---
3.	Peterson Equip Co.	---	Pete’s Plug

2.08 TREATMENT CHEMICALS/GLYCOL - WATER EQUIPMENT

A. Propylene Glycol shall:
1. Have distinguishing indicator color.
2. Shall have inhibitors formulated to minimize corrosion in brass, copper, solder metals, cast iron and steel.
3. Be recognized by the United States Food and Drug Administration as safe for use as an aqueous heat transfer medium for closed loop systems.
4. Have a density of 8.75 lb/per gallon at 60 degrees F.
5. Have a flash point of 225 degrees F.
6. Have a pH of 9.5 when mixed with water at 33.33 percent by volume.
7. Have a freeze point of 8 degrees F when mixed in a 30 percent aqueous solution.
8. Be mixed with de-ionized or distilled water to a 30 percent solution.

B. Glycol Charging Pump shall
1. Be portable self priming type with 3/4″ NPT inlet and discharge.
2. Be corrosion resistant with a direct drive 120 volt - 1/2 Hp motor. Connection shall be with a 120 V plug and cord set.
3. Be able to move 160 gallons per hour at a 40 psi discharge pressure at a 5′ suction.

C. Containment Rack shall:
1. Be of two 55 gallon drum size with capacity to accommodate one 55 gallon drum failure.
2. Be constructed of polyethylene or fiberglass or polyurethane coated steel.

D. Acceptable Manufacturers:

		Propylene Glycol	Pump	Rack
1.	Dow Chemical	---	---	---
2.	Houghton Chemical	Safe-T-Therm	---	---
3.	Interstate	Intercool NFP	---	---
4.	Liberty	---	See	---
5.	Little Giant	---	Drawing	---
6.	Teel	---	Schedule	---
7.	Eagle	---	---	LK33
8.	US Plastic	---	---	2 Drum
9.	Justrite	---	---	2 Drum

2.09 FLEXIBLE CONNECTORS

A. Heating and Cooling Water Systems:
1. Configuration flexible corrugated stainless steel hose within a braided stainless steel jacket. Ends shall be steel of either male NPT or flanged as required.
2. Unit shall be rated for 200 psi and 400 degrees F.
3. Lengths shall be minimum of four time the diameter.

B. Acceptable Products:

1.	Metraflex	ML
2.	MFC	Equal
3.	Hyspan	4500 Series
4.	Twin City	TCHS

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install specialties in accordance with manufacturer's instructions.
B. Provide 4" nipples and couplings at highest points in system.
C. Provide manual air vents at system high points and as indicated.
D. Provide strainer upstream of in-line pumps.
E. Install propylene/glycol water mix through a meter. Obtain exact volume of system.
F. Provide flexible connections on base pump inlet and outlets. Connections shall be full size of pump discharge and suction fitting inlet.
G. Provide pressure gauges in accord to the Drawings. Provide ½" pipe, valves and fittings as required to use a single gauge to measure pressure at multiple locations
H. Provide Test Plugs at locations shown on drawings
I.

3.02 CLEANING

A. See Section 232113.

B. Clean and reinstall all strainer screens.

C. Remove any start-up strainers after flushing is complete and before balancing. Blow wash and test water from system with compressed air or nitrogen. Fill with propylene/glycol water mix immediately.

3.07 COMMISSIONING

A. Fill heating water systems with Owner's make-up water and perform chemical water treatment start-up. Purge air from system. At contractor's option automatic air vents shall be installed at key locations in the systems. These shall be valved off after air is purged and system is in operation.

B. Fill propylene -glycol systems with specified mixture of water and propylene glycol. Do this slowly from the bottom of the system. Fill both supply and return pipe simultaneously. Vent air from high points. Do not operate system pump until air is initially vented from the system. Allow system to sit for 4 hours and then operate fill pump and vent again. Shut off fill pump when main system pump is operating. The make-up system is not intended to operate automatically. Vent air from air scoop after several hours of main pump operation

C. Confirm propylene glycol/water mix density. Adjust as required to meet specification.

D. Operate all manual and automatic valves through open-close cycle.

E. Check each pump to ensure proper rotation.
   1. Very each pump motor's overload heater ratings. This includes the pump supplied with the air handling unit.

F. Lubricate all pump motors and bearings.

G. Verify that equipment labels and pipe marker labels are installed.

H. Operate system for testing and balancing.

3.08 O & M

A. Glycol Fluid Analysis Service:
   1. Provide analysis of glycol fluid mixture every six months until warranty period has expired. Provide inhibitions as required.

END OF SECTION 232114

SECTION 232123 - HVAC PUMPS

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. New in-line pumps to circulate heating water at coils.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230710 – HVAC Pipe and Equipment Insulation.
   2. 232113 - Hydronic Piping.
   3. 232114 - Hydronic Specialties.

1.03 REFERENCES

A. UL 778 - Motor Operated Water Pumps.

B. NFPA 70 - National Electrical Code.

1.04 SUBMITTALS

A. Provide submittals in accord to Section 013300

B. Product Data: Provide pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Show horsepower, pressure drop and flow relationship. Show motor efficiency on base mounted pumps. Include electrical characteristics and connection requirements.

C. Manufacturer's Installation Instructions: Indicate hanging and support requirements and recommendations.

D. Submit line item price for pumps on Schedule of Values. Identify supplier vendor.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017823 the General Conditions.

B. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

1.06 REGULATORY REQUIREMENTS

A. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most

cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements. Where “Equal” is listed as the model number the pump shall most closely comply with the physical parameters.

2.02 MANUFACTURERS (SEE DRAWING SCHEDULEs. SCHEDULED PUMPS SHALL COMPLY WITH EITHER OF THE DESCRIPTIONS NOTED BELOW)

2.03 IN-LINE PUMPS

A. Type: Horizontal shaft, single stage, direct connected, with resiliently mounted motor for in-line mounting, oil lubricated, for 175 psig maximum working pressure.

B. Casing: Cast iron, with flanged pump connections. Shall be adjustable for mounting with pump flow in horizontal or vertical position.

C. Impeller: Stamped brass or cast bronze, keyed to shaft.

D. Bearings: Two, oil, grease or permanently lubricated bronze sleeve or ball bearings. Oil bearings shall have extended lubrication tubing.

E. Shaft: Alloy or stainless steel with copper or bronze sleeve, integral thrust collar.

F. Seal: Carbon rotating against a stationary ceramic seat, 225 degrees F maximum continuous operating temperature.

G. Drive: Flexible coupling. Direct keyed for high capacity.

H. Motor - Open drip proof: Voltage and phase as scheduled. Enclose terminal lugs in terminal box sized to NFPA 70. Motor for high capacity pump shall have grease lubricated ball bearings.

2.04 CARTRIDGE CIRCULATOR

A. Type: Cartridge, single stage, direct connected, with cartridge mounted motor for in-line mounting, system lubricated, for 125 psig maximum working pressure and 225 degrees F maximum working temperature.

B. Casing: Cast iron, with flanged pump connections. Shall be adjustable for mounting with pump flow in horizontal or vertical position.

C. Impeller: High strength non-metallic.

D. Shaft: Ceramic with carbon bearings bronze sleeve, integral thrust collar.

E. Seal: Motor shall be completely contained within a sealed canister.

F. Drive: Direct. Maximum 1750 RPM

G. Motor – Permanent Split Capacitor maximum 4600 RPM: Voltage and phase as scheduled. Enclose connections in sized to NFPA 70. NEMA 1 enclosure.

2.05 GLYCOL FILL PUMP- Shall be as specified in 232114.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify that electric power is available and of the correct characteristics.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide access space around pumps for service. Provide no less than minimum as recommended by manufacturer.

C. Decrease from line size with reducers. Support piping adjacent to pump such that no weight is carried on pump casings. Provide shut-off valves full size of pipe.

D. Lubricate pumps before start-up.

END OF SECTION 232123

SECTION 233100 - DUCTWORK

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
1. Contractor Provide:
a. Demolition of designated existing duct.
b. Provision of new supply, return, and exhaust duct.
c. Provide inspections, pressure tests and remedial work specified.
d. Modifications to existing duct as noted.
e. Removal and replacement of existing lay-in ceilings as required to access existing duct.
f. Close wall openings left where duct is removed.
g. Removal of existing air supply unit, fans, and other ducted equipment as noted.
h. Removal of existing fabric duct from the site.
i. Removal of louvers as noted.
j. Provision of “Blank Offs” where shown

1.02 RELATED WORK

A. Specified Elsewhere:
1. 230529 - Supports and Anchors for HVAC.
2. 230593 - Testing, Adjusting and Balancing for HVAC.
3. 230720 - Ductwork Insulation.
4. 233000 – Air Duct Accessories.
5. 233713 – Diffusers, Registers and Grilles.

1.03 SYSTEM DESCRIPTION

A. Definitions:
1. Ventilating Contractor = Ventilating Subcontactor.
2. Supply Ductwork - That duct downstream of coils, heaters and similar air conditioning equipment and which discharges to a space.
3. Exhaust Ductwork – That duct downstream of exhaust registers and grilles which discharges to the out-of-doors.
4. Return Ductwork - That duct upstream of coils or heaters or similar air conditioning equipment and which is downstream of room air intakes.
5. Outside Air Ductwork - That duct between outside air intakes and conditioning equipment.
6. Relief Air Duct - That duct between the out-of-doors and return air fans.
7. Energy recovery duct is that duct between energy recovery devices and intakes upstream of heating and/or cooling coils.
8. Exposed duct is that which can be seen from the floor of public and employee spaces. It does not include equipment rooms, garages, storage rooms or utility spaces.
9. Concealed duct is that above ceilings or within walls.
10. Exterior duct is that duct exposed to ambient “out of doors” conditions.
11. Thermal short circuits

B. Description:
1. Existing Natatorium – Duct shall be modified to operate with a new package air handling unit. Existing hard supply duct shall remain; but the fabric duct shall be replaced with new phenolic insulation duct. Exterior supply and return duct shall be phenolic insulation added to connect the new AHU to the building interior. New duct in the Mechanical room shall be fabricated aluminum with insulation covering specified.
2. New Exhaust duct shall be fabricated aluminum.

1.04 QUALITY ASSURANCE

A. Installers and Fabricators shall be fully familiar with S.M.A.C.N.A Construction Standards and the manufacturer’s requirements for the phenolic insulation.

1.05 REGULATORY REQUIREMENTS AND STANDARDS

A. NFPA - National Fire Protection Association
1. 90A – Installation of Air Conditioning and Ventilating Systems.

B. SMACNA – Sheet Metal and Air Conditioning Contractors National Association
1. HVAC Air Duct Leakage Test Manual
2. Phenolic Duct Construction Standards
3. HVAC Systems Design Manual

C. ASTM –
1. B 209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
2. B221-14 Standard specification for Aluminum and Aluminum- Alloy Extruded Bars, Rods, Wire, Profiles and Tubes
3. C518- Standard Test Method for Steady State Thermal Transmission Properties by Means of the heat Flow Meter Apparatus.
4. E84- Standard test Method for Surface Burning Characteristics of Building materials.

D. Underwriters Laboratories
1. UL 181 - Factory-Made Air Ducts and Connectors.
2. UL 723- standard Test Method for Surface Burning Characteristics of Building Materials

E. International Mechanical Code 2012.

F. International Energy Conservation Code 2018.

1.06 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Product Data:
1. Provide product data for Phenolic Insulation manufactured duct and fittings.
2. Provide material safety data sheets for sealants.

C. Shop Drawings:
1. Provide fabrication and assembly drawings for phenolic insulation duct. Both interior and exterior.

D. Installation Instruction- Provide for Phenolic Insulation Duct

E. For the Schedule of Values, submit line item prices for duct materials and installation. Submit a separate price for fabricated phenolic insulation duct. Price shall agree with the lien waivers supplied at the end of the project. Identify supplier vendor and sub-contractor.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017839.

B. Record actual locations of ducts and changes in duct size.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 MATERIALS

A. Aluminum Ducts: ASTM B209 and B221-14 lock-forming quality having natural finish.

B. Flexible Ducts:
1. Construction:
a. Liner shall be lock formed aluminum or Polymer film over a polymer wire helix.
b. Insulation shall be 2.5 inch, R 8.0 fiberglass blanket with a scrim re-enforced polyester film vapor barrier.
2. Minimum Maximum Velocity rating: 5000 fpm.
3. Temperature Range: - 20 degrees F to 175 degrees F.
3. Manufacturers:

		6” Pressure
a.	Flexmaster	Type TLB
b.	Thermaflex	PHD

D. Fasteners: Rivets, bolts, or sheet metal screws. Match material type of metal.

F. Sealants - shall be flexible setting water based, water resistant type compatible with ducts sealed. Shall have flame spread no more than 5.0 when .020" thick. Shall have anti-microbial agents. Material shall be listed and labeled in accordance to UL 181 A, B or C as applicable.

2.03 ALUMINUM DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated. Duct shall be able to accommodate pressures of plus/minus 2” of water gauge without collapse or leaks. Minimum gauges shall be in accord to SMACNA and ASHRAE standard except as noted on Drawings.

B. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Provide these whether or not they are shown on the drawings.

C. Increase duct sizes gradually, not exceeding 30 degrees divergence.

D. Duct shall be made with a minimum of joints and seams. Joint clip ends shall be removed where they overlap the width and/or height of the duct. Longitudinal seams shall be sealed and hammered tight per installation paragraph below.

2.05 PHENOLIC INSULATION DUCT

A. Material Requirements
1. Shall apply to all rectangular duct and fittings designated for exterior out-door use and for use in the Natatorium and the ceiling above the natatorium.
2. Material shall e CFC/HCFC free closed cell phenolic foam faced on both sides with 1 mil aluminum foil, reinforced with glass scrim or solid aluminum with no perforations. An additional 1000 micron high impact resistant, ultraviolet stable an infrared reflective titanium infused vinyl shall be fully laminated to both sides of the insulation board.
3. Insulation panels shall have an aged R-value of no less than 6.0 and thickness shall be no less than 7/8″ thick for Natatorium use. The aged R- value for Exterior Duct shall be no less than 12.0; thickness shall be no less than 1-25/32 inches. Conductivity shall be no less than .146 Btu x in/hr x sq. ft. x degrees F @ 50 degrees F.
4. Permeability shall be no more than 0.00 perms when tested to ASTM E96/E96M, Procedure A.
5. All new materials shall pass U.L. test for bacteria growth.
6. Noise reduction coefficient shall be a minimum of 0.05 per ASTM C423.
7. All interior liner shall bear markings required by UL181.
8. Minimum compressive strength shall be no less than 28 psi at 10 percent compression.
9. Density shall be between 3.43 and 3.75 pounds per cubic foot.
10. Manufactured insulated panel with glass scrim, foil and foam shall pass U.L. Burning Test 181 with flame spread index of no more than 25 and a smoke developed index of no more than 50. End connections shall be aluminum type flanges.
11. Assembly shall be rated for continuous temperatures of 185 degrees F. It shall be rated for a 4″ maximum positive pressure and a 3″ negative pressure

B. Closure Materials
1. V-grove adhesive silicone.
2. 1000 micron high impact titanium infused vinyl preformed factory made seamless corners. Overlap corner seams and welded titanium infused vinyl seams.

C. Fabrication Sealing System
1. Aluminum scrim with woven glass fiber with U.V. stable vinyl cladding.
2. Seam covers shall be a minimum of 2-7/8″.
3. Sealants shall be low VOC.
4. Color shall be paintable white in the inside and shall be one of at least 3 manufactured colors for exterior duct. Color to be selected by the owner.

5. Shall be water, mold, and mildew resistant.

D. Duct Connectors:
1. Shall be aluminum type of as required by the manufacturer for the service shown. These can be flanged with claw or tooth configurations or interlocking type. Connections shall be sealed air tight and covered to prevent thermal short circuits. Thermal short circuits shall not exist on the completed work.
2. Connections shall be designed to maintain the air-tight assembly of the duct structure for the hanger arrangement required by the manufacturer and this specification.

E. Fabrication
1. Shall be done by trained and locally licensed firms in strict compliance with manufacturers requirements.
2. Firms shall be able to show proof of licensure and training for individuals actually doing work.
3. Fabricate duct to accommodate pressure of 4″ positive pressure and 3″ negative pressure; velocities of up to 4000 feet per minute and temperatures up to 176 degrees F.
4. Use flanges for field connections.
5. Seal all cuts into foam.
6. Cover all flanges.
7. Elbows and transitions shall be made with turning vanes in a manner equivalent to that noted for fabricated sheet metal.
8. All fabrication work shall be in accord to the manufacturer’s standards.

F. Manufacturer:
1. Kingspan Insulation of Atlanta Georgia.

2.06 DUCT SUPPORTS

A. Wire rope supports shall be made with 316 stainless steel.
1. Wire rope shall have a 7 x 7 core and shall have a rated load of 250 pounds for a non-lifting application.
2. Wye connectors shall be pear shaped with threaded coupling connector.
3. Rope clamps shall be capable of keeping 85% of the wire rope strength, given 2 connectors

B. Strut supports
1. Within the Natatorium or Ceiling space above the natatorium shall be aluminum. Strut hardware shall be aluminum.
2. Within the Mechanical room and out-of-doors strut supports shall be galvanized steel.
3. Hanger rods shall be machined fiberglass or 316 stainless steel with tensile rating of 200 pounds when used with double type 316 stainless steel nuts.
4. Upper attachments shall be stainless steel beam clamps or shall be auxiliary struts secured to the tops of the existing structure.

C. Aluminum straps and angles.
1. Shall be used within the natatorium or the ceiling space above the natatorium.
2. Shall be of sufficient width and thickness to carry a minimum of 200 pounds with each vertical member. Shall be assembled into “Trapeze” configurations
3. Upper attachments shall be loops of strap around existing structural elements or around auxiliary struts which bear on existing structure. Auxiliary struts shall be secured to the existing structure.

PART 3 - EXECUTION

3.01 REMOVAL OF EXISTING CONSTRUCTION

A. Ductwork designated for removal shall:
1. Be removed such that duct and equipment to remain is not damaged.
2. Be removed from the site.
3. Fabric duct shall be removed from the site.

B. Removals for ductwork shall include all hangers and supports. Where branch ducts are removed from mains which remain provide a patch of the same material as the existing duct.

C. Where duct removal leaves openings.
1. Patch opening on both sides of wall with drywall or aluminum sheet. Pack void with fiberglass batt insulation.

3.02 APPLICATION (See notes above.)

A. Use flexible duct between diffusers and hard duct. Limit to a maximum of 5’-0” long except where shown otherwise.

3.03 INSTALLATION

A. Aluminum Duct seams and joints shall be hammered, rolled or sealed airtight. All transverse and longitudinal joints in supply, return and exhaust ducts shall be sealed with sealant specified. Corners on fittings and connections to equipment shall be sealed tight.

C. Apply duct sealant according to manufacturer's instruction. Allow sealant material to acclimate before application. Do not install when space temperature is less than 40 degrees F. Remove excess material on exposed duct.

D. Provide openings in ductwork where required to accommodate thermometers and controllers.

E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

F. Use double nuts and lock washers on threaded rod supports.

H. Connect flexible ducts to metal ducts with adhesive plus sheet metal screws or draw bands. Bends of over 45 degrees in flexible duct are not permitted.

I. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

J. Flanged connections shall have reinforced bolted corners. Flanges shall be sealed with field applied closures.

K. Sharp corners on standing seams and supports shall be bent over and ground smooth.

L. Installation of exterior duct shall be done in accord to manufacturer’s Standards except as noted here-in or detailed on the drawings.

M. Hangers and supports shall maintain the duct in the position shown. Use floor supports where indicated and where floors are convenient for use. Use cable supports and hanger rod supports where support is from ceiling Structures. Provide sufficient support to prevent duct twisting.

3.04 FIELD QUALITY CONTROL

A. Visual Inspection - Contractor shall provide visual inspection of work as it progresses to insure supports, sizes, configuration and tightness specified is maintained. A/E will occasionally inspect for same qualities.

B. If Testing and Balancing performed in Section 230593 shows fan horsepower and pressure curves do not match the volumetric readings obtained at the inlets and outlets the ducts, the ducts shall be re-inspected visually.

C. Whenever Testing and Balancing or Owner inspections determine there may be leaks in the duct system, seal openings found. Redoing Test and Balance work is an acceptable method of proving duct is airtight.

3.05 INSTALLER QUALIFICATIONS

A. General Requirements
1. Shall be experienced as to the techniques and requirements necessary for the installation of ductwork specified.
2. Shall adhere to the requirements specified here-in for the products.
3. Lead installers shall remain onsite through-out installation of duct type being installed.

B. For Phenolic Insulation Duct.
1. Lead Installers shall have training by a factory technician on site for a minimum of 8 hours. Documentation of similar training for the lead installer received during prior projects is acceptable. Documentation of factory trained techniques for the lead installed, received at the manufacturer’s factory or certified fabrication shop is also acceptable.
2. Shall have written set of the manufacturer’s instructions on site during the assembly of all duct.

3.07 ACCESS TO EXISTING DUCT

A. Lay-in Ceilings:
1. Remove ceiling panels and cross tees as required to access work.
2. Store removed materials on-site. Protect from damage.
3. Determine existing damage before work commences. Document degree with Owner and A/E.
4. Replace ceiling material broken during access, demolition, or installation operations.
5. Replace ceiling components to original condition when complete.
6. Temporarily secure items as lighting, speakers, diffusers, etc. where cross tees are removed.

END OF SECTION 233100

SECTION 233300 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Turning vanes.
      b. Duct access doors.
      c. New Insulated Automatic damper On Existing Exhaust Fan
      d. Volume controls and air scoops with manual operators.
      e. Flexible connections.
      f. Screens.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 233100 - Ductwork.

1.03 REGULATORY REQUIREMENTS AND STANDARDS

A. International Mechanical Code 2012.

B. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

C. NFPA 70 - National Electrical Code.

D. SMACNA - HVAC Duct Construction Standards - Metal and Flexible.

1.04 SUBMITTALS

A. Submit under provisions of Section 013300

B. Product Data: Provide for dampers, access doors, turning vanes and hardware used.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 017839

B. Record actual locations of access doors.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016000
B. Protect dampers from damage to operating linkages and blades.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single

manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 TURNING VANES

A. Shall be used only where long radius elbow will not fit.

B. Construct of aluminum in a double wall air foil configuration.

C. Blade runners shall mount on top and bottom of turn. Blades shall snap into runner on a 1-1/2″ nominal spacing.

D. Turning vanes for phenolic duct shall use materials matching the duct or shall use the aluminum specified above.

2.03 BACKDRAFT DAMPERS

A. Gravity Backdraft Dampers furnished with Air Moving Equipment and fans: Air moving equipment manufacturers standard construction.

2.04 CONTROL DAMPERS

A. Insulated Control Dampers Shall:
1. Be (blades and frame) entirely constructed of 6063T5 extruded aluminum with mill finish.
2. Have airfoil shaped blades.
3. Be of parallel blade double damper (in series) configuration. Blades shall trap a maximum of 4 inches of dead air space between them when closed.
4. Have thermal break between double blade assembly.
5. Have field replaceable edge blade seals with inflatable pockets mechanically locked into extruded blade slots.
6. Have hexagonal or square axle shafts with molded synthetic bearings. Provide linkage outside of the air stream
7. Pressure drop shall not exceed .12 inches of water at a 2000 foot per minute velocity. The leakage rate shall not exceed 6 cfm per square foot at a pressure differential of 4 inches of water gauge.

B. Actuators shall:
1. Be 120 volt, 2 position , spring loaded type that will close upon loss of electric power.
2. Have end switches to prove open and closed damper positions.
3. Direct couple to the damper shaft and mount to the damper frame.
4. Have capacity to tightly close a doubled 24″ x 24″ damper.
5. Have sealed cord connection with a minimum of 6 feet of grounded SO cord.

C. Acceptable Products
1. Damper Ruskin CD 40X2
2. Operator Belimo ZG-JSLA+LF120 series

2.04 DUCT ACCESS DOORS

A. Access doors shall be of fabricated aluminum construction. Provide with full length aluminum piano hinges on one side and aluminum slide bolt locks on the other side. Provide one cam lock for doors less than 12″ wide and on a maximum of 12″ centers. Provide two mating aluminum angle or hemmed frames around the entire door perimeters. Provide with foam gaskets.

B. Acceptable Manufactured Products:

1. Duro Dyne Y DAD

2.05 FLEXIBLE DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

B. Connector: Fabric crimped into metal edging strip.
1. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq. yd.
2. Net Fabric Width: Approximately 3″ wide.
3. Metal: 1" wide, 22 gage aluminum
4. Fabric for connections exposed to weather shall be resistant to ultra violet light.

2.06 VOLUME CONTROL DEVICES

A. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.

B. High efficiency take off shall:
1. Include a round butterfly damper.
2. Have an inlet at least 25% larger than the outlet.
3. Have a round or rectangular inlet with tab connections and a backing angle.

B. Splitter Dampers:
1. Material: Same gage as duct to 24″ size in either direction, and two gages heavier for sizes over 24″.
2. Blade: Fabricate of double thickness sheet metal to streamline shape, secured with continuous hinge or rod.
3. Operator: Quadrant type.

C. Single Blade Dampers: Fabricate for duct sizes up to 12" x 20". Provide end bearings in all sizes except those 10″ and smaller.

D. Air Scoops:
1. Shall be fabricated of re-enforced aluminum sheet with aluminum hinges and adjustable position operator.
2. Units shall be constructed with corrosion resistant fasteners.
3. Configuration shall use supporting end mounting bracket, hinged panel with lateral supports and rod type operators which will extend out through the duct wall and which can be locked into position.
4. Diffuser accessories which meet the requirements of the paragraphs above are acceptable.

E. Manual Damper Operators:
1. Shall be lockable quadrant type for use in accessible ductwork. Quadrant shall have graduations, and set screw let lever handle. Rods shall be 3/8″ square key stock.

2.07 SCREENS

A. Shall have 1-7/8″ wide 18 gauge double hemmed aluminum frame around full perimeter. Frames shall match size of duct drops. Holes shall be a maximum of 18″ on center around the perimeter with no more than 3″ from corner edges. Press fabric into frames.

B. Screen material shall be either woven wire cloth or flattened expanded metal.
   1. Expanded metal shall be 0.08″ thick flattened aluminum sheet with 3/″ openings with 74 percent open area.
   2. Wire cloth shall be woven aluminum wire. Wire shall be .063″ diameter wire woven in a two mesh pattern with 76.4 percent open area.

C. Available Products:
   1. Expanded Metal 4′ x 8′ sheet McNichols Co.
   2. Wire Cloth 48″ wide roll McNichols Co. 380-263-4810
   3. McNichols Co. telephone 800/237-3820.

PART 3 - EXECUTION

3.01 PREPARATION

A. At existing low level intakes that will be served by the new roof exhaust fan:
   1. Field measure existing duct to verify size of screens.

3.02 DEMOLITION

A. Careful Removal:
   1. Remove existing screens without damaging the duct to which the screens are attached.
   2. Dampers and bird screens can be cut up as required to remove.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions and SMACNA HVAC Duct Construction Standards - Metal and Flexible. Refer to Section 233100 for duct construction.

B. Provide duct access doors for inspection and cleaning where indicated.

C. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

D. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly See Section 233713. Install minimum two duct widths from duct take-off. Balance dampers are not required where air scoops are shown.

E. Use splitter dampers on nested fittings.

END OF SECTION 233300

SECTION 233423 - FANS

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. New roof mounted exhaust fans for Therapy, Lap Pool and Whirlpool areas and Leisure Pool Area.
      b. Curbs and installation in the roof
      c. Additional framing support.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230900 – Temperature Controls
   1. 233100 - Ductwork.
   2. 233300 - Air Duct Accessories.
   3. 230593 - Testing, Adjusting and Balancing for HVAC.

1.03 REFERENCES

A. AMCA 99 - Standards Handbook.

B. AMCA 211 - Laboratory Methods of Testing Fans for Rating Purposes.

C. AMCA 261 - Directory of Products Licensed to bear the AMCA Certified Ratings Seal.

D. AMCA 300 - Test Code for Sound Rating Air Moving Devices.

E. AMCA 311 - Method of Publishing Sound Ratings for Air Moving Devices.

F. NEMA MG1 - Motors and Generators.

G. NFPA 70 - National Electrical Code.

H. UL 705 - Power Ventilators.

1.04 DESCRIPTION

A. Definition:
   1. Ventilating Contractor = Ventilating Subcontractor for this work.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300

B. Product Data: Provide data on fans and accessories including fan curves with specified operation point clearly plotted, sound power levels at rated capacity, and electrical characteristics and connection requirements. Fan curves are required. Single points will not be acceptable.

C. Manufacturer’s Installation Instructions.

D. Submit line item prices for separate equipment costs of fans and curbs and for the installation of the curbs in the roof on the Schedule of Values. Identify supplier vendor and roof subcontractor as applicable.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 017823

B. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.07 COORDINATION

A. With Electrical Trades:
1. Deliver switches, thermostats, speed controls, damper operators for installation.
2. Confirm rough-in location of devices.

1.08 RECORD DRAWINGS -

A. Locate actual location of fan on roof plan if it has been moved more than 3 feet in any one direction.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item, which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 PRODUCT REQUIREMENTS

A. Performance Ratings: Conform to AMCA 211 and bear the AMCA Certified Rating Seal.

B. Sound Ratings: AMCA 311, tested to AMCA 300, and bear the AMCA Certified Sound Rating Seal.

C. Fabrication: Conform to AMCA 99.

D. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.

2.03 ROOF FANS

A. Upblast Centrifugal Fans:
1. Shall have spun aluminum and band, venturi and hood and a fabricated base. Interior surfaces of the air way shall be coated an epoxy phenolic coating.
2. Drive shall be “V”-belt or direct as scheduled. Drive shall be rated for 150 percent of motor horsepower; bearings for 1/2 horsepower and less shall be sealed type rated for 200,000 hours. Bearings for 3/4 horsepower and above shall have grease fittings extended for access. Sheaves and pulleys shall be cast iron or steel.

3. Wheel shall be backward inclined centrifugal, non-sparking with a cast hub. Vanes shall be riveted or welded. Assembly shall be statically and dynamically balanced.
4. Motor shall be high efficiency drip proof type. Motors 1/2 horsepower and less shall have permanently lubricated bearings. Larger motors shall have ball bearings with extended grease fittings for field lubrication.
5. Electrical Components:
   a. Provide electrical wireway from under curb cap to motor compartment.
   b. Provide motor speed control to match motor (Per Drawing Schedule). Speed control shall be solid state type for use with 120 volts with motors up to 1/3 horsepower.

   c. Provide NEMA disconnect under hood.

2.04 ROOF CURBS

A. For Standing Seam Metal Roof
1. Be of straight sided welded galvalume construction.
2. Have 1-1/2″ fiberglass insulation.
3. Have 2″ x 2″ treated wood nailer.
4. Be matched to the pitch of the roof steel so sides are plumb.
5. Be matched to the profile of the Existing roof material.
6. It is acceptable to the existing Roof Manufacturer as a match to the roof. (That is Peterson Aluminum Corporation Tite-Loc steel roof panel.

C. Acceptable Products:

	Upblast
1. Greenheck	CUE/CUBE
2. Loren Cook	ACRU

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer’s instructions.

B. Roof Fans:
1. Secure with stainless steel lag screws to roof curb. Adapt existing curbs with pressure treated wood and aluminum flashing.
2. Extend ducts into roof curb.
3. Install resilient isolators in continuous strips under full perimeter of curb.
4. Install backdraft dampers on inlet to roof fans.
5. Assemble damper motors.

C. Wall Fans:
1. Secure per details.
2. Install screens over moving equipment. Be sure dampers and fans operate freely.

D. In-line Fans:
1. Support from structure above. Use equipment supports specified in 220529. Support independently from ceiling and ductwork.
2. Provide flexible connections on fans rated at 1/4 horsepower and above.

3. Enclosures of fans with grilles shall be installed flush with ceilings. Grilles shall squarely overlap ceiling and shall be square with lines of room.

E. Ceiling Fans:
1. Support in accord to manufacturer’s direction.

F. Circulation Fans:
1. Support in accord to detail on the Drawings.

G. Do not operate fans for any purpose until duct work is clean, filters in place, bearings lubricated, and fan has been test run under observation.

END OF SECTION 233423

SECTION 233600 – AIR TERMINAL UNITS

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide: Variable air volume box and controls for automation of Mechanical Room Auxiliary Control. (See schedule on Drawings)

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230593 - Testing, Adjusting and Balancing for HVAC.
   2. 230130 – Ductwork.
   3. 233000 – Air Duct Accessories.

1.03 REFERENCES

A. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

B. NFPA 70 - National Electrical Code.

C. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.04 DESCRIPTION

A. Definitions:
   1. Ventilating Contractor = Ventilating Subcontractor.

B. Layout Parameter:
   1. Variable air volume box is being used to automate the function of sharing some air from existing ASU4 to be used to counteract heat gains in the mechanical room which are impeding the cooling of other building spaces.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300. Contractor’s shall examine submittals furnished by suppliers and determine if submittals are complete an accurate before forwarding them to the A/E. Submittals for this section shall include:
   1. A listing of the operating parameters including air flow(cfm), pressure drop, and noise coefficients.
   2. Dimensional data of boxes and accessories.
   3. Temperature control diagrams and product data for controls

B. Submit line item price for VAV on Schedule of Values. Identify supplier vendor.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description

to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 AIR TERMINALS (High Pressure Type)

A. Shall be pressure independent, 100 percent shut-off low leakage type rated for operational pressures of 2″ to 4″ of water gauge with excursion pressures of 5″ of water.

B. Construction shall be of 22 gauge galvanized steel. Lining shall be matte faced 1″ fiberglass liner (closed cell foam) meeting NFPA-90A and UL 181 requirements or liner shall have integral edge coating shall be fabric faced natural fiber meeting NFPA 90 for fire resistance and ASTM G21 and G22 for microbial inhibitor.

C. Controls shall include enclosure with removable door, electric barrier strips, static and flow probes. Assembly shall be able to accept the installation of a shaft mounted controller as noted in 230900 which will use the factory furnished airflow and static signals.

D. Configuration shall include round collar inlet with butterfly damper and rectangular drive clip outlet connections.

E. Function shall be cooling only.

F. Acceptable Products:
1. Krueger LMH Series.
2. Titus ESV Series.
3. Price SXV Series.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions. Adjust position as required to accommodate the installation of the temperature controller. Installing the box up-side-down is acceptable.

B. Install new VAV boxes in locations shown on drawings. Install where operator is accessible. Assemble or reassemble factory and/or Owner supplied parts as required to make VAV box fully operational.

END OF SECTION 233600

SECTION 233713 – DIFFUSERS, REGISTERS AND GRILLES

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Ventilating Contractor Provide:
      a. Drum Louvers
      b. Diffusers and registers.
      c. Exhaust grilles.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230593 – Testing Adjusting and Balancing for HVAC.
   2. 233100 – Ductwork.
   3. 233000 – Air Duct Accessories.

1.03 REFERENCES

A. ADC 1062 - Certification, Rating and Test Manual.

B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.

C. ARI 650 - Air Outlets and Inlets.

D. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.

E. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

F. ASTM D3363-92A – Standard Test Method for Film Hardness by Pencil Test

G. ASTM D2794-93(2019) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)

H. ASTM D2247-15(2020) – Standard Practice for testing water resistance of coatings in 100% Relative Humidity

I. ASTM D870- 15(2020) – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion

J. ASTM B117-19 Standard Practice for Operating Salt Spray (Fog) Apparatus

K. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.04 DESCRIPTION

A. Definition:
   1. Ventilating Contractor = Ventilating Subcontractor.
   2. Register – Is a grille with an attached damper.
   3. Register, Grille and Diffuser Dimensions Size = A x B where A = Width and B = Height.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300 Contractor’s shall examine submittals furnished by suppliers and determine if submittals are complete an accurate before forwarding them to the A/E. Submittals for this section shall include:
   1. A schedule showing each device, its model, its neck size, the outside dimensions of the airway, number and direction of throw and mounting type.

2. Height and width dimensions of louvers and verification that subcontractors and general contractors have verified these items.

B. Submittals without evidence of contractor verification or without schedules will be returned to contractors before A/E reviews them further.

C. Submit line item price for grilles on Schedule of Values. Identify supplier vendor.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not include the items include in the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 REGISTERS, GRILLES AND DIFFUSERS

A. All units:
1. Shall have a minimum over lap margin of 1".
2. Shall have off-white baked enamel finish. Finish shall be anodic Baked on acrylic paint with a pencil hardness of HB to H and Which passed a 100 hour ASTM B117 corrosive Environments Salt Spray Test without any failure. The paint shall also pass the ASTM D2794 Reverse Impact Cracking test with a 50 in-pound force applied.
3. Shall have accessory mounts to match ceiling or wall finish type shown on Architectural Drawings.

B. Directional (louvered) diffusers shall:
1. Be "snap-in" louvered core type with 1, 2, 3 or 4 way discharge pattern.
2. Be of aluminum construction with hair line joints.
3. Have 23-3/4 x 23-3/4 white pans for lay-in ceilings.
4. Have square to round adaptors where used with round duct.

C. Double deflection registers shall have individually adjustable vertical front bars on 3/4" centers and horizontal rear bars set on 3/4" centers. Front and rear bars shall be airfoil shaped extruded aluminum. Construct frame of heavy extruded aluminum with gusseted joints.

D. Drum louvers shall be constructed of aluminum with adjustable cylindrical drums which can pivot a minimum 60 degrees. Provide individual vanes within the rotatable drums which are individually adjustable. Frame shall be extruded aluminum. It is acceptable to provide aluminum air scoops or diversion dampers which comply with 233300 as part of the unit.

E. Exhaust grilles shall have straight extruded aluminum face bars set at 0 degrees on 0.5" centers. Bars shall be parallel to the short dimension. Frame shall be Extruded aluminum with welded and gusseted construction.

T. Acceptable Products:

Manufacturers Type	Krueger	Price	Titus
1. Directional Diffusers	5SHPC	AMDE	TDC-AA

2. Exhaust Grilles	S585	610Z Series	55FS Series
3. Double Deflection Registers	5800 Series	620 Series	272 Series
4. Drum Louvers	DPL Series	AHCD Series	DL-SV Series

PART 3 - EXECUTION

3.01 PREPARATION

A. Determine position of diffusers and grilles.

B. Check if discharge pattern covers room space.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

E. Adjust vanes, drums and face bars to sweep spaces within the room.

END OF SECTION 233713

SECTION 237490 - PACKAGED DEHUMIDIFICATION/ AC UNIT

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
1. Contractor Provide:
a. Packaged Dehumidification/ AC Unit with remote Fluid Cooler
b. Startup of units by manufacturer.
c. Coordination with Temperature Controls Contractor.
d. Coordination with trades building support structures.
e. Coordination with trades providing electric power.
f. Coordination with trades providing piping connections.
g. Coordination with trades providing ducted connections.
h. Two years of Manufacturer’s direct observation of the operating parameters of the Dehumidifier/ Air Conditioner operation.
i. Registration of equipment for warranty purposes.

1.02 RELATED WORK

A. Specified Elsewhere:
1. 230529 – Supports and Anchors for HVAC.
2. 230553 - Identification for HVAC Pipe and Equipment.
3. 230593 - Testing, Adjusting and Balancing for HVAC.
4. 230710 - HVAC Pipe and Equipment Insulation.
5. 230800 – Commissioning of HVAC
6. 230900 – Temperature Controls
7. 232114 – Hydronic Specialties
8. 232123 – Pumps
9. 233100 - Ductwork.

1.03 REFERENCES

A. AHRI 340/360 – Unitary Large Equipment.
B. AHRI 410 – Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program
C. ASHRAE 90.1 - 2013 - Energy Efficient Design of New Buildings except Low Rise Residential Buildings
D. ASTM D3363-92A – Standard Test Method for Film Hardness by Pencil Test
E. ASTM B3359-17 – Standard Test Methods for Rating Adhesion by Tape Test
F. ASTM D2794-93(2019) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
G. ASTM D2247-15(2020) – Standard Practice for testing water resistance of coatings in 100% Relative Humidity
H. ASTM D870- 15(2020) – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion
I. ASTM B117-19 Standard Practice for Operating Salt Spray (Fog) Apparatus
J. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.04 DESCRIPTION

A. Definition:
1. Packaged Dehumidification/AC Unit equal AHU
B. System and Equipment Description

2. Equipment Purpose is to condition the Natatorium air. A schematic of the system is shown on sheet on H204 of the drawings.

2. The Operational Concept of the equipment is to minimize the amount of outside air used to carry away humidity and contaminants from the air and to instead use refrigeration to cool the air and remove water vapor. The resultant water saturated cool air to be reheated with energy recovered from the vapor compression of the refrigerant cycle.
3. The system is not designed to use recovered heat to heat the swimming pool water.
4. The system is designed to remove the air most likely to be contaminated (that air from deck level) from the building before it can mix with less contaminated air (that air from the mid- height returns). The system uses separate exhaust fans for both Minimum outside air and “purge” operations. Purging is not to use 100 percent outside air. It is intended to be used when a trained operator is watching the system and operating controls manually.
5. This system concept was chosen as it fit within the physical space available and could utilize the available electric power and heating water system.
6. The equipment is sized to match the current space size and use. There is the future possibility the natatorium size and use may be reduced to about ½ of the present need. The new equipment shall be capable of operating at ½ capacity with minor modifications as described here-in.

1.05 SUBMITTALS FOR REVIEW

A. Submit in accord to Section 0133000. Clearly show which equipment applies to this work.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements. Show pipe and duct connections. Provide complete power and control wiring diagrams. Show field and factory wiring. Provide pump curves and fan curves. Provide dimensional drawings that show required support points.

C. Submit manufacturer's installation instructions. Indicate assembly, support details, connection requirements, and include start-up instructions. Submit equipment “start-up” checklist with initial submittal.

D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing and list and telephone numbers of service personnel. Data shall be made specific to the equipment supplied with this project. Information pertinent to supplied equipment shall be high lighted with yellow markers or non-pertinent information shall be struck out.

E. Submit line item price for Dehumidifier/AC unit on Schedule of Values. Identify supplier vendor.

1.06 REGULATORY REQUIREMENTS

A. Underwriter’s Laboratory (U.L.)
B. Canadian Standards Association (CSA)
C. NFPA 70 National Electric Code

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Protect units from physical damage until roof mounting curbs are in place.

1.08 QUALITY CONTROL

A. Equipment startup: (See 230800)
   1. Shall be performed by factory trained and certified technicians.
   2. Shall work through manufacturer’s check list before machines are started.
   3. Equipment startup and training shall be listed as a separate line item on the Contractor’s Schedule of Values and Pay Request.

1.09 WARRANTY

A. Provide two year parts and 1 year labor warranty from date of Substantial Completion. Parts replaced under the original warranties shall be warranted for a minimum of 1 year from the date of shipment. Provide connection between manufacturer and Owner

B. Provide five year parts only warranty on compressors starting with date of shipment.

1.10 EXTRA MATERIALS

A. Provide three sets of filters to be used at start-up and air balance. Obtain a receipt from the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer’s number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define a single manufactured item which does not match the written description, the model number shall be modified as required to most closely meet the described requirements.

2.02 BASIS OF DESIGN

A. Is as noted on drawing schedule, Units of other manufacture shall be capable of meeting performance requirements scheduled with electrical connections shown and shall also fit the allocated space. Added costs required for using other units shall be included by the bidder. Contractor in submitting bid, agrees no additions will be required for different equipment.

2.03 PACKAGED DEHUMIDIFICATION / AC Units

A. General: Package units having electric refrigeration (including compressors, evaporator coils, fluid cooled condensers, heat recovery coil, supply fans, filters, and air routing sections. Units shall be factory assembled in a maximum of one section. Completed unit shall undergo a factory run test prior to shipment. It shall be shipped with full charge of refrigerant.

B. Description: Self-contained, packaged, factory assembled, pre-piped, and prewired, consisting of cabinet and frame, 2 supply fans, 2 refrigerant evaporator coils, 2- 2 speed refrigerant compressors, 2 liquid cooled refrigerant condensers, heat recovery coils, fluid cooler pump, with controls, air filters and appurtenances. Coils, filters, and duct inlets and outlets shall be arrayed in a stacked configuration; with 50% of airflow and capacity accommodated by each layer of the stack. Evaporator coils shall be piped in separate refrigerant circuits. Compressors,

condensers, the pump, and their accessories shall be located outside of the airstream in their own section of the cabinet. Electrical and control components shall be in another separate compartment. A separate package unit shall include coils, fans, electrical power and control components and framework pre-piped and pre-wired to cool the refrigerant condensers furnished in the package unit noted above.

C. General Construction:

1. Cabinet shall be constructed of G90 galvanized steel sheet for Galvalume alloy sheet with mill-applied zinc phosphate primer with an exterior grade silicone modified polyester top coat. The outer walls and roof shall be constructed of a minimum of 20 gauge; liner shall be a minimum of 24 gauge. The floor shall be a minimum of 16 gauge with a 20 gauge liner. Panels shall be broken and formed to provide a rigid structure. Mechanically fasten panels to base frame and each other to provide a water and air tight assembly. Caulk all seams with silicone.
2. Cabinet base rails shall be no less than 2 layers of 10 gauge mill galvanized G90 steel sheet formed to support the entire assembly. Provide with fork lift and crane lifting provisions.
3. Provide multiply hinged access doors at filters, fans, compressors, other equipment, electric power connection and system controls. Latches shall be key lockable. Doors shall be double wall.
4. Insulation shall be installed between the outer and inner panels of the walls, ceiling, floor and doors. It shall have thermal properties equal equal to 2″ of fiberglass with a thermal conductivity of 0.26 Btu/hr-sq. ft.-in.-Deg F.
5. Exterior finish shall include a base primer with a high quality polyester resin top coat in an off white, light grey, or beige color. Outer surface shall be able to withstand a 750 hour salt spray test made in accord to ASTM B117. Provide labels which identify lift points and caution and service areas. All component spaces shall be labeled.

D. Blowers

1. Access to blowers shall be through access doors.
2. Blowers shall be of equal size, capacity, and arrangement. These shall be mounted in a parallel array. Blowers shall be single width, single inlet airfoil plenum type, with direct drive. Fan wheels shall be G90 galvanized steel with baked power paint coating. Shaft shall be polished steel coated with corrosion inhibitor. The complete assembly shall be statically and dynamically balanced.
3. Each motors shall be premium efficiency, TEFC, NEMA MG1-PART 31 Inverter duty 15:1 constant torque for severe duty with a minimum 1.25 service factor. Frame construction shall be painted cast iron. Motors shall have 6 poles and operate nominally at 1200 RPM synchronous speed. Provide with hand off auto switch with safeties against over loading at 60 hertz operation directly on mains. Motors shall have double lip seals with re-greaseable bearings. Greasing locations shall be at accessible locations within the unit.

4. Blower assembly shall be mounted on spring loaded isolators with 1 inch of deflection. Fan inlets shall be screened against accidental contact.
5. Blower motors shall each be factory wired with VFD drives. Drives shall be low motor noise high starting torque type and shall be usable for air balancing purposes. The VFD shall have a minimum drive efficiency of 96 5 with a displacement power factor of 0.98, output maximum frequency of 400 hertz with torque boost. Provide VFD with these protective features: Torque limit; heat sink over temperature; current limiting direct current fuse; electronic motor overload with

phase to phase and ground fault short circuit protection; current limit; over-under torque and voltage protection; short circuit current rating of 30kA rms symmetrical and 100kA rms symmetrical.

E. All coil assemblies shall include:
1. Copper tubes mechanically bonded to aluminum fins for maximize heat transfer.
2. Galvanized steel casing and end plates.
3. All drain pan, fin, casing and tube surfaces coated with a polyester enamel coating complying with ASTM B117/D1654 and ASTM D2126.

F. Evaporator/ de-humidifier coil assemblies shall include:
1. Fully welded positive draining drain pan with female NPT connection complying with ASHRAE 62.
2. Thermostatic expansion valves and solenoid valves. Expansion valves shall have an externally balanced port configuration. Valve shall have removable power head.
3. Design and configuration that maximizes moisture removal.
4. Be configured and tested for use with refrigerant R410A.

G. Integral re-heat coils shall:
1. Be configured to operate with a mixture of 30 percent propylene glycol and water. Coils shall be manifolded together. Manifold connections shall be capable of separating the function of the re-heat coils in the future.
2. Be able to transfer up to 100 % of the heat of rejection from both compressors heat of rejection.

H. Air Filters shall be located down stream of both the outdoor air intake and the return air connection. Provide with racks that are capable of accommodating 2 inch thick Merv 8 pleated filters of standard sizes manufactured for use in the USA. Filter racks shall be configured for “face” or “edge” “slide-in” replacement. Filter racks shall be constructed of non-metallic elements. Future isolation of fan operation shall utilize solid elements in filter space to block flow.

I. Dampers for outside air shall be made with insulated double-wall. Blades off extruded anodized aluminum in an opposed blade configuration. Damper blades shall rotate on nylon bushings. Steel shafts and linkage shall be coated in same manner as coils. Provide spring return modulating damper motors. Dampers used for bypass-operation shall have parallel blade configuration.

J. Compressors and Refrigerant systems
1. Provide two (2) separate refrigerant circuits which each include a specified evaporator coil, a compressor, receiver. a liquid cooled condenser, check valve, service valves, liquid line filter drier, pump down solenoid valve, and devices noted in coil paragraph. Provide circuit with pressure transducers and tamper proof non-adjustable pressure switches at compressor suction and discharge. Provide read out points for transducers. Refrigerant systems shall be completely factory installed. No field refrigerant work shall be required.
2. Provide hermetic scroll compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, motor overload protection, suction and discharge service valves refrigerant site glasses and gage ports.

3. Compressors shall be 2 speed. For each compressor, Capacity range shall be 40 to 60 percent at stage 1 and 100 percent at stage 2.
4. Compressors shall be located in their own compartment and be independently serviceable.
5. Provide five minute timed off circuit to delay compressor start. (Anti recycle timer).
6. System shall be charged with R-410A and compatible oil.
7. Suction piping shall be covered with 0.5 inch thick closed cell foam insulation.
8. Receivers shall have indicating sight glasses for both maximum and minimum refrigerant levels.

K. Liquid Cooled Condenser and Pump System
1. Condenser shall be plate and frame type heat exchanger sized for the Full heat of rejection of the compressor and evaporator operating at full scheduled capacity with a 30 % solution of propylene glycol and water cooled by the fluid cooler operating with inlet air of 95 degrees Fahrenheit.
2. Exchanger pressure drop shall allow for scheduled fluid flow of Exchanger given the pump scheduled with the package.
3. Exchanger shall be capable of with-standing 650 psi maximum refrigerant operating pressures.
4. Pump shall be cast iron inline type with horizontal motor sized to deliver the scheduled fluid flow at the external static pressure scheduled. External static shall not include pressure drops of any items contained in the system package.
5. Pump and fluid cooled condensers shall be factory piped and wired on both the refrigerant, water glycol sides. Flanged terminations shall be included for connection of field installed piping. Provide a low point drain/fill connection on the package. Provide control valves for directing glycol water to either the heat recovery coils or the fluid cooler.

L. Fluid Cooler:
1. Coils shall be copper tubes mechanically bonded to aluminum fins in a counter flow vertical configuration. Frame shall be galvanized steel. Provide factory piped copper manifold piping with flanged connections for system connection.
2. Provide direct drive vertical discharge aluminum axial fans, resiliently mounted with fan guard, motor overload protection, wired to operate with 24 volt signal from package unit components specified above. Fans shall have aerodynamically optimized sickle blade profile with serrated trailing edge and winglets on the blade outer edge.
3. Motors shall be EC Commutated direct current external rotor type. It shall have a rotor with permanent magnets and an integral controller to provide the windings with electrical current to cause motor rotation. Drive motor shall be sealed per protection class IP54 with moisture protection impregnation of the windings. Fan /motor assembly shall be balanced in Class G 6.3 acc DIN ISO 1940, dynamic on two levels and shall be suitable for operation between -40 degrees F and 158 degrees F. Thermal contacts installed in the windings shall be compliant with THCL 155.
4. Provide coil guards.

M. Operating and Monitoring Controls: (See Points list in 230900)
1. Shall be able to accept output from DDC control systems specified in Section 230900.
2. Shall operate both supply blowers with separate VFD drives. Provide refrigerant, solenoid valves, motorized control valves, motorized dampers, glycol water pump, compressors with inverter control, fluid cooler fan controls in accord with the package system requirements. These shall include mechanical process de-humidification, space cooling, operation of supply fans, operation of outdoor air damper,

operation of unit mounted re-heat coil with associated control valve and pump, operation of heat rejection fluid cooler with associated control valves and fan controls.

3. Shall have barrier strip for connections to temperature control systems and safety interlocks.
4. Shall have connections for smoke detector shut downs provided by others to de-energize supply fans.
5. Shall have dry contacts for alarm, blower interlocks, outdoor air damper control, fluid cooler, and a “system On” indicator.
6. Shall have monitor/control interface enabling manufacturer to remotely communicate with the system control and access operation of equipment.

N. Control Sequence of Operation

1. When the system is energized electrically there shall be an initial delay period for sensors to stabilize; supply blowers shall energize. Operation shall continue as noted below.
2. Supply fans shall operate at balanced set points. Duplex supply fans shall operate as one unit with their individual controls. Supply fans speed shall increase to maintain system external static pressure, as system filters load with dirt. Outdoor air damper shall open when system is energized. Outdoor air damper shall close if supply air temperature falls below 32 degrees Fahrenheit. “Re-set” of damper position shall be manual.
3. The unit shall operate in its de-humidification mode if space relative humidity or return air dewpoint setpoints are exceeded. Compressors shall stage on and modulate as required to match the load. Glycol-water pump shall energize. Heat rejected through condenser shall be modulated to the reheat coil as required to meet setpoints noted above and space temperature setpoint. Remaining heat shall be rejected through fluid cooler.
4. The unit shall operate in its cooling mode when return air temperature is above the setpoint. Compressors shall be staged and modulated as required to maintain setpoint. Glycol pump shall energize. Heat shall be rejected through condenser and fluid cooler.

N. Electrical Connections:

1. Provide contactors, disconnect, and over current protection for each individual motor. All shall be factory wired to a single point power connection with disconnect means for the entire main unit. Provide an unfused disconnect to serve the motors in the fluid cooler.
2. Provide 24 volt control transformer as required to operate devices specified in the main unit and the remote fluid cooler.
3. Provide a fused disconnect or breaker sized for the entire unit.
4. Provide “single phase” or “brown-out” protection for each compressor. Provide over all overall voltage monitor and single phase protection.
5. All wiring shall be factory installed in accord to NEMA Requirements and U.L. Standards.

O. Acceptable Products: See Drawing Schedule

PART 3 - EXECUTION

3.01 EXAMINATION

A. Coordination

1. Work with support subcontractor to determine exact dimensions, required for structural support.

2. Work with temperature controls trade to make connections.
3. Work with electric trade to coordinate fuse sizes required. Verify that proper power supply is available.
4. Work with Owner to determine setpoint requirements, monitoring, Contacts and training schedules. Turn door keys over to the owner.
6. Work with piping contractor to determine connection points of the fluid cooler and the assembled package unit. Provide with exact fluid volume. Note separate expansion tank is specified for the system.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with International Mechanical Code 96.

3.03 STARTUP

A. Owner Training: Certified manufacturer’s representative shall meet with Owner’s representative two separate time to explain system operation and controls of specific units supplied for this project. Second session shall be just before final payment is made to contractor. Session shall utilize operation manuals.

B. Provide a sign-up sheet for training sessions. Obtain signature of all those trained. Coordinate date and time of training session with Owner’s representative. Ad hoc sessions with whomever maybe available at an uncoordinated session are not acceptable.

C. Start-up shall be performed according to manufacturer’s instruction modified as required by circumstances of installation. Deliver manufacturer’s executed start-up list to the Owner.

END SECTION 237490

SECTION 238216 AIR COILS

PART 1 - GENERAL

1.01 WORK INCLUDES

A. Base Bid:
   1. Contractor Provide:
      a. Heating Coils as scheduled.

1.02 RELATED WORK

A. Specified Elsewhere:
   1. 230529 – Supports and Anchors for HVAC.
   2. 230593 Testing , Adjusting and Balancing for HVAC
   3. 230710 – HVAC Pipe and Equipment Insulation
   4. 232113 – Hydronic Piping
   5. 232114 – Hydronic Specialties
   6. 232123 - HVAC Pumps
   7. 238400 – Package De-Humidifier/AC.

1.03 DESCRIPTION

A. Layout Parameter:
   Coils shall be inside of building mounted in ductwork downstream of the Package Dehumidifier/AC Unit.

1.04 REFERENCES

A. AHRI 410 – Forced-Circulation Air-Cooling and Air-Heating Coils Certification Program
B. ASHRAE 90.1 - 2013 - Energy Efficient Design of New Buildings except Low Rise Residential Buildings
C. ASTM D3363-92A – Standard Test Method for Film Hardness by Pencil Test
D. ASTM B3359-17 – Standard Test Methods for Rating Adhesion by Tape Test
E. ASTM D2794-93(2019) – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
F. ASTM D2247-15(2020) – Standard Practice for testing water resistance of coatings in 100% Relative Humidity
G. ASTM D870- 15(2020) – Standard Practice for Testing Water Resistance of Coatings Using Water Immersion
H. ASTM B117-19 Standard Practice for Operating Salt Spray (Fog) Apparatus
I. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.05 SUBMITTALS

A. Submit under provisions of Section 013300. Contractor shall examine submittals furnished by suppliers and determine if submittals are complete an accurate before forwarding them to the A/E. Submittals for this section shall include:
   1. Dimensions
   2. Configuration
   3. Performance
   4. Selection Data
   5. Installation instructions

PART 2 - PRODUCTS

2.01 MANUFACTURER & PERFORMANCE

A. Unless otherwise specified the manufacturer's number specified or scheduled is listed merely as an aid to prospective bidders. In most cases it is an incomplete number and relies upon the written description to fully define the item. Where model numbers define characteristics not in the written description, the model number shall be modified as required to meet the described requirements.

2.02 HEATING WATER COILS

A. All coil assemblies shall include:
1. Copper tubes mechanically bonded to aluminum fins for maximize heat transfer.
2. Galvanized steel casing and end plates. Air connections shall be flanged. Casing thickness shall be minimum of 16 gauge.

3. All frame, fin, casing and tube surfaces coated with a polyester enamel coating complying with ASTM B117/D1654 and ASTM D2126.

B. Performance shall:
1. Deliver heat output scheduled given the water flow, air flow, water pressure drop, water temperatures and air pressure drop scheduled.
2. Be certified in accord to AHRI Standard 410.

C. Configuration shall match that required by the plan drawing as confirmed by the installing contractor.

D. Fins shall be .0075 inch thick aluminum in a "waffle" configuration with 0.625" center hole and nominal 1.5" x 1.3" individual dimension.

E. Tubes shall be .035 inch thick x .0625inch diameter copper tubing mechanically expanded into the fin material. Tubes shall be braised onto steel headers in a parallel/series configuration.

F. Connections shall be carbon steel with male pipe threads. Furnish with vent connection at high point.

G . Acceptable Products:
1. Coilmaster HWC0 Series

Commented [LC1]:

PART 3 - EXECUTION

3.01 PREPARATION

A. Determine the likely configuration of the piping with the installing contractor.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and IEEE 515.1

B. Install terminations and connections where they are protected from abuse and potential damage.

C. Install with vent at relative high point.

B. Bolt coil to flanged connections. Independently support coil from ductwork. Isolate coil frame from the aluminum duct with neoprene gaskets

C. Work with insulating trade to determine when and how insulation should be installed.

1.03 COMMISSIONING AND TESTING

A. Provide temperature and Pressure drop measurements across coil in accord to 230593. Do for both the airside and the water side.

END OF SECTION 238216

SECTION 260500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 SUMMARY

A. Contractor Provide Base Bid:
1. Labor and materials for complete electrical systems. These materials include, but are not limited to: circuit breakers, devices, boxes, conduit, conductors, connectors, fittings, and anchors, as required and indicated in these specifications and/or shown on the Electrical Drawings.
2. Power connections and control equipment and wiring as required for equipment provided under other sections or by Owner.
3. All minor system components reasonably required for the proper functioning and/or safe operation of the systems and to meet all related codes and ordinances.
4. Required system and component testing as required in these specifications and/or related codes and ordinances.
5. Coordination with other trade contractors.
6. Sleeves for raceways and cables.

1.02 RELATED WORK

A. Specified elsewhere:
1. 260519 – Low-Voltage Electrical Power Conductors and Cables
2. 260523 – Control-Voltage Electrical Cables
3. 260526 – Grounding and Bonding for Electrical Systems
4. 260529 – Hangers and Supports for Electrical Systems
5. 260533 – Raceway and Boxes for Electrical Systems
6. 260544 – Sleeves and Sleeve Seals for Electrical Raceways & Cabling
7. 260553 – Identification for Electrical Systems
8. 262416 - Panelboards
9. 262726 - Wiring Devices

1.03 REFERENCES - LATEST EDITIONS

A. NFPA 70 - National Electrical Code.

B. Americans With Disabilities Act - (ADA).

C. International Building Code (IBC).

D. Illinois Accessibility Code.

E. Illinois Energy Conservation Code (IECC).

F. All other Contract Documents - including Construction Drawings.

1.04 VERIFICATION OF POINTS

A. Before submitting his bid, Contractor shall visit the site to carefully verify all exposed points of existing utilities and new connections. Contractor shall verify concealed or buried points of connection as near

as possible. Verify these points, as to locations, size, type, depth, operating characteristics, and complications; including, but not limited to:

1. Present site conditions.
2. Present electrical utility distribution system and requirements.
3. Work associated with equipment provided under other sections or by Owner.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide all information requested.

B. When two or more items of same material or equipment are required, they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw materials, bulk materials, wire, conduit, fittings, sheet metal, steel bar stock, welding rods, solder, fasteners, motors for dissimilar equipment units, and similar items used in Work, except as otherwise indicated.

C. Provide products compatible within systems, with interconnected systems, and with other connected items.

D. Provide permanent operational data nameplate on each item of power operated equipment, indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and similar essential data. Locate nameplates in an accessible location.

2.02 PRODUCT OPTIONS AND SUBSTITUTIONS

A. Options and Substitutions shall be done per the Division 1 instructions.

B. All product substitutions shall include any incurred costs by the Contractor, any sub-contractor, other trades, Owner, or Owner’s consultants. No increase in cost or contract shall be allowed for modifications or corrections, due to approval of Contractor requested or submitted substitutions.

2.03 ELECTRICAL SUBMITTALS

A. Submit per specification Division 1 requirements.

B. Electrical equipment submittals shall include a clear item description - not just catalog number.

C. Catalog pages must be clearly marked to indicate the exact product being proposed with all necessary accessories and options identified and selected. Pages including multiple products or options, where selections are not indicated may be rejected for re-submittal.

2.04 DELIVERY, STORAGE AND HANDLING

A. Deliver products to project site with proper identification, including; names, model numbers, types, grades, compliance labels, and similar information needed for distinct identifications; adequately packaged and protected to prevent damage during shipment, storage, and handling.

B. Store equipment and materials at the site, unless off-site storage is authorized in writing. Protect stored equipment and materials from damage.

C. Coordinate deliveries of electrical materials and equipment to minimize construction site congestion. Limit each shipment of materials and equipment to the items and quantities needed for the smooth and efficient flow of installations.

PART 3 - EXECUTION

3.01 COORDINATION

A. Coordinate all work per requirements of Division 1.

B. See mechanical and architectural specifications, drawings, and submittals, for work concerning the connection of electrical power and any required controls.

C. Contractor shall verify electrical characteristics and requirements (name plate data) of equipment furnished by others (FBO) for proper coordination and equipment operation. Contractor shall confirm requirements of final equipment furnished by others (FBO) and shall select associated electrical devices accordingly. Before any work is installed, and before any equipment is purchased, The Contractor shall carefully check specifications and plans for every trade and job condition, and any lack of coordination between his work, the plans, specifications, or job conditions shall be immediately reported to the Architect/Engineer in writing.

D. Contractor shall coordinate equipment connection requirements with approved equipment submittals, prior to rough-in.

3.02 ROUGH-IN

A. Verify final locations and electrical characteristics for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications, of other divisions, for rough-in requirements.

C. Coordinate rough-ins for Owner provided equipment.

3.03 ELECTRICAL INSTALLATIONS

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounted items.

C. Coordinate electrical equipment and materials installation with other building components.

D. Right-of-way: Give to piping systems installed at a required slope.

E. Verify all dimensions by field measurements.

F. Arrange for chases, slots, and openings in other building components to allow for electrical installations.

G. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.

H. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work.

I. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.

J. Where mounting heights are not detailed or dimensioned, install electrical services and overhead equipment to provide the maximum headroom possible.

K. Install electrical equipment for compliance with code-required clearances and to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.

L. Provide access panels and doors for electrical items behind finished surfaces or otherwise concealed.

M. Coordinate the installation of electrical materials and equipment above ceilings with suspension system, mechanical equipment, other systems and structural components.

N. Drawings for work under Divisions 260000 are Diagrammatic and are intended to convey scope of work and indicate general arrangement of conduit, boxes, equipment, lighting fixtures, and other work included in the contract.
   1. See details and schedules on drawings and specifications for meanings of abbreviations, additional requirements, and information. Check civil, architectural, structural, mechanical, and other electrical drawings for scale, space limitations, beams, door swings, windows, ductwork, coordination, and additional information, and report any discrepancies or conflicts to Architect/Engineer prior to submitting bid.
   2. The Contractor shall install and completely wire all equipment furnished by others (FBO) in accordance with the Manufacturer's wiring diagrams and as required for a complete operating installation. Contractor shall verify and coordinate electrical characteristics and requirements of (FBO) equipment prior to ordering associated equipment or rough-in of conduit and wiring to avoid conflicts.

3.04 RECORD DOCUMENTS

A. Provide record documents as required by this Article and Division 1 specifications.

B. Mark Drawings to indicate revisions to conduit size and location both exterior and interior, actual equipment locations, dimensioned to column lines, concealed equipment dimensioned to column lines, distribution and branch electrical circuitry, fuse and circuit breaker size and arrangements, support and hanger details, Change Orders, and concealed control system devices.

C. Accurately mark locations of underground, or under floor electrical conduits and conductors. Provide dimensions from fixed points of reference.

D. On-site record mark ups shall be monitored for compliance with record keeping requirements.

3.05 OPERATION AND MAINTENANCE DATA

A. Procedures and requirements for preparation and submittal of maintenance manuals shall be done as required by Division 1.

B. In addition to the information required by Division 1 specifications, include the following information when requested:
1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.
2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions.
3. Maintenance procedures for routine preventative maintenance and troubleshooting, disassembly, repair, and reassembly, aligning and adjusting instructions.

3.06 WARRANTIES

A. Procedures and submittal requirements for warranties shall be done, as required by the Division 1 specifications, and as pertains to specific warranties. See individual equipment specifications for warranty requirements.

B. Compile and assemble the warranties specified in Divisions 260000 into a file folder labeled for this project.

C. Provide complete warranty information, for each product or equipment item, to include date of beginning of warranty or bond; duration of warranty or bond; and names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

D. Except as modified in individual specification sections:
1. All materials and workmanship shall be warranted for 1 year.
2. All warranties begin upon official date of substantial completion, allowing Owner’s beneficial use of the work.

3. Warranted materials shall be provided for replacement within 30 days of notice of failure to Contractor (or as specifically allowed by Owner's Representative).
4. The first year of warranted items shall include materials and labor for replacement/repair and shall be responded to, within 10 working days of notice of problem to Contractor.
5. Warranty material replacements shall not diminish Owner's stock of extra items.

3.07 CLEANING

A. General requirements for final cleaning shall be done as required by Division 1.

B. Maintain clean work space with daily cleanup of all occupied areas.

3.08 TESTING

A. Provide testing and documented results as required by each specification section or applicable codes, laws, and ordinances.

B. Provide testing and documented results as required or recommended by manufacturer(s) for certification or warranty.

END OF SECTION 260500

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For testing agency.

C. Field quality-control test reports.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.

4. Senator Wire & Cable Company.
5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Type THHN-THWN.

D. Multiconductor Cable (MC): Not permitted unless specifically noted or approved otherwise.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper. Stranded for all conductors.

B. Branch Circuits: Copper. Stranded for all conductors.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway.

B. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway. Metal-clad multi-conductor cable is not permitted.

F. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

G. Class 1 Control Circuits: Type THHN-THWN, in raceway.

H. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.

1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

C. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 0519

SECTION 260523 - CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Low-voltage control cabling.
2. Control-circuit conductors.
3. Identification products.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. IDC: Insulation displacement connector.

C. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control and signaling power-limited circuits.

D. Open Cabling: Passing telecommunications cabling through open space (e.g., between the studs of a wall cavity).

1.4 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 50 or less.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.
   1. Test each low voltage cable for open and short circuits.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. Support of Open Cabling: NRTL labeled for support of cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

B. Conduit and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems." Flexible metal conduit shall not be used.

   1. Outlet boxes shall be no smaller than 2 inches wide, 3 inches high, and 2-1/2 inches deep.

2.2 LOW-VOLTAGE CONTROL CABLE

A. Plenum-Rated, Paired Cable: NFPA 70, Type CMP.

   1. Size and configuration as recommended by the manufacturer.
   2. PVC insulation.
   3. PVC jacket.
   4. Flame Resistance: Comply with NFPA 262.
   5. All cabling shall be furnished and installed per equipment manufacturer’s recommendations.

2.3 CONTROL-CIRCUIT CONDUCTORS

A. Class 1 Control Circuits: Stranded copper, Type THHN-THWN, in raceway, complying with UL 83.

B. Class 2 Control Circuits: Stranded copper, Type THHN-THWN, in raceway or power-limited cable, concealed in building finishes, complying with UL 83.

C. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type TW or Type TF, complying with UL 83.

2.4 IDENTIFICATION PRODUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Brady Corporation.
2. HellermannTyton.
3. Kroy LLC.
4. Panduit Corp.

B. Comply with UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 INSTALLATION OF PATHWAYS

A. Install manufactured conduit sweeps and long-radius elbows if possible.

B. Pathway Installation in Equipment Rooms:

1. Secure conduits to backboard if entering room from overhead.
2. Extend conduits 3 inches above finished floor.
3. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.2 INSTALLATION OF CONDUCTORS AND CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

1. Terminate all conductors; no cable shall contain un-terminated elements. Make terminations only at indicated outlets and terminals.
2. Cables may not be spliced. Secure and support cables at intervals not exceeding 60 inches and not more than 6 inches from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
3. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii.
4. Do not install bruised, kinked, scored, deformed, or abraded cable. Remove and discard cable if damaged during installation and replace it with new cable.
5. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. Installation of Control-Circuit Conductors:

1. Install wiring in raceways. Comply with requirements specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

D. Open-Cable Installation:

1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend copper cable not in a wireway or pathway a minimum of 8 inches above ceilings by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

E. Separation from EMI Sources:

1. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches.

2. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches.

3. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:

   a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
   b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches.
   c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches.

4. Separation between Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches.
5. Separation between Cables and Fluorescent Fixtures: A minimum of 5 inches.

3.3 CONTROL-CIRCUIT CONDUCTORS

A. Minimum Conductor Sizes:

1. Class 1 remote-control and signal circuits, No 14 AWG.
2. Class 2 low-energy, remote-control, and signal circuits, No. 16 AWG.
3. Class 3 low-energy, remote-control, alarm, and signal circuits, No 12 AWG.
4. Minimum sizes may be modified if manufacturer’s recommendations are different.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. Visually inspect cable placement, cable termination, grounding and bonding, equipment and labeling of all components.

C. End-to-end cabling will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 26 0523

SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:

a. Plans showing as-built, dimensioned locations of grounding features specified in "Field Quality Control" Article, including the following:
1) Ground rods.
2) Ground rings.
3) Grounding arrangements and connections for separately derived systems.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   1. Stranded Conductors: ASTM B 8.
   2. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
   3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   4. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

D. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

E. Conduit Hubs: Mechanical type, terminal with threaded hub.

F. Ground Rod Clamps: Exothermic or one-shot compression type, copper or copper alloy, terminal with hex head bolt.

G. Straps: Solid copper, copper lugs. Rated for 600 A.

H. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal one two-piece clamp.

I. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

J. Water Pipe Clamps:

   1. Mechanical type, two pieces with zinc-plated bolts.

      a. Material: Tin-plated aluminum.
      b. Listed for direct burial.

   2. U-bolt type with malleable-iron clamp and copper ground connector.

2.5 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 4/0 AWG minimum.

1. Bury at least 24 inches below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.

B. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors.
3. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Handholes: Install a driven ground rod through handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, non-shrink grout.

C. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.3 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
2. Lighting circuits.
3. Receptacle circuits.
4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.

C. Water Heater and Heat-Tracing Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

3.4 FENCE GROUNDING

A. Fence Grounding: Install at maximum intervals of 40 feet except as follows:

1. Gates and Other Fence Openings: Ground fence on each side of opening.

    a. Bond metal gates to gate posts.
    b. Bond across openings, with and without gates, except at openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

B. Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2 unless otherwise indicated.

C. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

D. Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

3.5 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. Use exothermic welds for all below-grade connections.
3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

G. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections with the assistance of a factory-authorized service representative.

C. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method or the attached rod technique according to IEEE 81.

4. Prepare dimensioned Drawings locating each ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

D. Grounding system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

F. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 3 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 3 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.

4. Substations and Pad-Mounted Equipment: 3 ohms.

G. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 26 0529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

1.5 SUBMITTALS

A. Product Data: For the following:

1. Steel slotted support systems.

1.6 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Comply with NFPA 70.

1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Allied Tube & Conduit.
b. Cooper B-Line, Inc.; a division of Cooper Industries.
c. ERICO International Corporation.
d. GS Metals Corp.
e. Thomas & Betts Corporation.
f. Unistrut; Tyco International, Ltd.
g. Wesanco, Inc.

2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
3. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
4. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be

incorporated into the Work include, but are not limited to, the following:

1) Cooper B-Line, Inc.; a division of Cooper Industries.
2) Empire Tool and Manufacturing Co., Inc.
3) Hilti Inc.
4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
5) MKT Fastening, LLC.

2. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
3. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
4. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
5. Toggle Bolts: All-steel springhead type.
6. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps, single-bolt conduit clamps, or single-bolt conduit clamps using spring friction action for retention in support channel.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69, or Spring-tension clamps.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touchup: Comply with requirements in painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529

SECTION 26 0533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. IMC: Intermediate metal conduit.

D. LFMC: Liquidtight flexible metal conduit.

E. RSC/RGC: Rigid steel conduit / Rigid galvanized conduit.

F. PVC/RNC: Polyvinylchloride / Rigid nonmetallic conduit.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Alflex Inc.

3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.
9. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. IMC: ANSI C80.6.

D. EMT: ANSI C80.3.

E. FMC: Zinc-coated steel or aluminum.

F. LFMC: Flexible steel conduit with PVC jacket.

G. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
2. Fittings for EMT: Steel, set-screw or compression type.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. CANTEX Inc.
4. CertainTeed Corp.; Pipe & Plastics Group.
5. Condux International, Inc.
6. Electri-Flex Co.
7. Lamson & Sessions; Carlon Electrical Products.
8. Manhattan/CDT/Cole-Flex.
9. RACO; Hubbell Co.
10. Thomas & Betts Corp.

B. RNC: NEMA TC2, Type EPC-40-PVC, unless otherwise indicated.

C. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

2.3 METAL WIREWAYS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.

C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Screw-cover type unless specifically noted otherwise on the drawings.

E. Finish: Manufacturer's standard enamel finish.

2.4 SURFACE RACEWAYS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Hubbell
2. Panduit
3. Thomas & Betts Corp.
4. Wiremold Company; Legrand.

B. Surface metal raceways: Galvanized steel with snap-on covers. Manufacturer’s standard enamel finish color selected by Owner.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. EGS/Appleton Electric.
3. Erickson Electrical Equipment Company.
4. Hoffman.
5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
6. O-Z/Gedney; a unit of General Signal.
7. RACO; a Hubbell Company.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet Division.
10. Spring City Electrical Manufacturing Company.
11. Thomas & Betts Corporation.
12. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

D. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:

1. Exposed Conduit: Rigid steel or IMC conduit.
2. Concealed Conduit, Aboveground: RNC, Type EPC-40-PVC.
3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Comply with the following indoor applications, unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
5. Damp or Wet Locations: Rigid steel conduit or IMC.
6. Raceways for Communications Cable in Spaces Used for Environmental Air: EMT.
7. Raceways for Concealed General Purpose Distribution of Low-Voltage and Communications Cable: EMT.
8. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, nonmetallic in damp or wet locations.

C. Minimum Raceway Size: 3/4-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

E. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.

F. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

G. Raceway Terminations at locations subject to moisture or vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

H. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

I. Flexible Conduit Connections: Use maximum of 72 inches of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in all damp or wet location applications in this scope of work where the conduit is exposed.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom for pipe less than 6 inches in nominal diameter.
2. Install structural backfill, where not encased in concrete.
3. After installing conduit, backfill and compact. Start at tie-in point and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. Install continuous warning ribbon after 12” of backfill have been placed over the conduit. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with compaction equal to or greater than area being excavated.
4. Install manufactured duct elbows for stub-ups at equipment and at building entrances, unless otherwise indicated. Provide RGS factory elbows or concrete encase PVC elbows for stub-up ducts through the length of the elbow.

B. Concrete-Encased Conduit:

1. Provide conduit supports to allow concrete to flow around conduit without restriction.
2. Concrete around conduits containing medium voltage cables shall be tinted RED.
3. Provide continuous warning ribbon 12" above top of conduit(s). Provide second warning ribbon at 12" below final grade during backfill above concrete.

3.4 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

C. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:

a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.

b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Advance Products & Systems, Inc.
    b. CALPICO, Inc.
    c. Metraflex Company (The).
    d. Pipeline Seal and Insulator, Inc.
    e. Proco Products, Inc.
2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
3. Pressure Plates: Stainless steel.
4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

    a. HOLDRITE.

2.4 GROUT

A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, non-shrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Comply with NECA 1.

B. Comply with NEMA VE 2 for cable tray and cable penetrations.

C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.

D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.

E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.

B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

A. Install sleeve-seal fittings in new walls and slabs as they are constructed.

B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.

C. Secure nailing flanges to concrete forms.

D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Identification for raceway.
2. Identification for conductors and communication and control cable.
3. Equipment identification labels.
4. Miscellaneous identification products.
5. NEC required equipment markings for Arc-Flash Hazard.

1.3 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with 29 CFR 1910.145.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT IDENTIFICATION LABELS

A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

2.2 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.
2. Tensile Strength: 50 lb, minimum.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

C. Arc-Flash Hazard Labels:
1. Comply with NEC Article 110.
2. Install adhesive warning label on each new electrical panel and fused safety disconnect switch.

PART 3 - EXECUTION

3.1 APPLICATION

A. Power-Circuit Conductor Identification: For primary and secondary conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, manholes, and handholes use color-coding conductor tape marker tape. Identify source and circuit number of each set of conductors. For single conductor cables, identify phase in addition to the above.

B. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.

C. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where 2 lines of text are required, use labels 2 inches high.
b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled:

a. Switchboards, Transformers, Panelboards, electrical cabinets, and enclosures.
b. Control devices.
c. Equipment disconnect switches.

3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
1. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
2. Provide red colored conduit for all new fire alarm system cabling.
3. Provide blue colored conduit for all new data system cabling.
4. Provide orange colored conduit for all new fiber optic cabling.
5. Provide white colored conduit for all new control systems cabling.

E. Color-Coding for Phase and Voltage Level Identification, 600 V and Less: Use the colors listed below for ungrounded service, feeder, and branch-circuit conductors.

1. Color shall be factory applied or, for sizes larger than No. 10 AWG if authorities having jurisdiction permit, field applied.

2. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.

c. Phase C: Yellow.

3. Colors for 208/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.

4. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

END OF SECTION 260553

SECTION 262416 – PANELBOARDS

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Base Bid:
   1. General Contractor Shall Provide:
      a. Installation of new Lighting and appliance branch-circuit panelboard.

1.2 RELATED DOCUMENTS

A. Drawings and other specification sections.

1.3 SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For panelboards and related equipment.

   1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
   2. Detail enclosure types and details for types other than NEMA 250, Type 1.
   3. Detail bus configuration, current, and voltage ratings.
   4. Short-circuit current rating of panelboards and overcurrent protective devices.
   5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
   6. Include wiring diagrams for power, signal, and control wiring.

C. Panelboard Circuit Directories: For installation in panelboards. Submit final versions after load balancing.

D. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals.

   1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
   2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA PB 1.

D. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards.

B. Handle and prepare panelboards for installation according to NECA 407 and NEMA PB 1.

1.6 PROJECT CONDITIONS

A. Environmental Limitations:

1. Rate equipment for continuous operation under the following conditions unless otherwise indicated:

a. Ambient Temperature: Not exceeding plus 104 deg F.

B. Service Conditions: NEMA PB 1, usual service conditions, as follows:

1. Ambient temperatures within limits specified.
2. Altitude not exceeding 6600 feet.

C. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect and Owner’s representative no fewer than two weeks in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without the Architect and Owner's written permission.
3. Comply with NFPA 70E.

1.7 COORDINATION

A. Coordinate the demolition, layout, and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARD

A. Enclosure: Surface-mounted cabinet.

1. NEMA 1 enclosure.
2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
3. Directory Card: Inside panelboard door, mounted in transparent card holder.
4. Keys: Two for panelboard cabinet lock.
5. Circuit Breakers: Reference panel schedule for breaker quantities and ratings.

B. Incoming Mains Location: Bottom or top.

C. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

D. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Main and Neutral Lugs: Mechanical type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.

E. Service Equipment Label: NRTL labeled for use as service equipment.

F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

G. Panelboard Short-Circuit Current Rating: 18,000 amperes, symmetrical, verified with utility service rating.

2.2 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARD

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eaton – Culter Hammer; Glendale Heights, IL
2. GE
3. Siemens
4. Square D; Schneider Electric; Palatine, IL.

B. Panelboards: NEMA PB 1:
1. Lighting and appliance branch-circuit type.

C. Mains: 100 amp bus, main lugs.

D. Branch Overcurrent Protective Devices: Plug-on or bolt-down circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock. Constructed for NEMA 1 enclosure rating.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Match to panel board:

B. Molded-Case Circuit Breaker (MCCB): Listed with a NRTL, with interrupting capacity to meet listed fault current. Reference drawings for panel schedule and additional information.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits.
2. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:

a. Standard frame sizes, trip ratings, and number of poles.
b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
c. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
d. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panelboard according to NECA 407 and NEMA PB 1.1.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboard for compliance with installation tolerances and other conditions affecting performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install panelboard and accessories according to NECA 407 and NEMA PB 1.1.

B. Mount top of branch panel trim a maximum of 72 inches above finished floor unless otherwise indicated.

C. Mount panelboard cabinet plumb and rigid without distortion of box.

D. Install overcurrent protective devices and controllers not already factory installed.

E. Install filler plates in unused spaces.

F. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing. The ungrounded and grounded circuit conductors of each multi-wire branch circuit shall be grouped by cable ties or similar means in at least one location within the panelboard or other point of origination.

G. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads after balancing panelboard loads.

1. Incorporate Owner's final room designations. Obtain approval before installing.
2. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
3. Leave locations of spare breakers or panel spaces blank. Indicate spare breaker locations in pencil.
4. For existing panelboards: Revise identification of breakers to indicate modifications to loads and circuit uses, or to correct inaccuracies found.
5. Directory must meet requirements of NEC 408.4. Panel schedules furnished on drawings are generally not intended

to be substitutes for the final panel circuit directories, and shall not be considered sufficient.

C. Spaces in new panelboards shall be identified as follows:

1. Each single pole breaker space shall have a separate identification.
2. Example: The left side of a 42-space panelboard shall use odd numbers 1-41, in ascending order from top to bottom.
3. Multi-pole breakers or spaces shall use numbers from all spaces occupied (i.e. a 2-pole space or breaker shall be identified using both single pole spaces taken up). Multi-pole spaces shall not be identified using a single number. (Exception: Switchboard switch units shall be identified with a single number.)
4. Circuits with emergency loads shall be marked with highlighter type marker.
5. Circuits with fire alarm equipment loads shall have a red handle lock device.

D. Panelboard Nameplates:

1. Label panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
2. Include power source on panelboard nameplate to satisfy requirement of NEC 408.4(B).

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:
1. Test continuity of each circuit.

C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Panelboards will be considered defective if they do not pass tests and inspections.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION 262416

SECTION 262726 – WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Receptacles, receptacles with integral GFCI, and associated device plates.
   2. Special purpose receptacles and outlets.

1.2 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: One for each type of device and wall plate specified, in each color specified, if requested.

C. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

1.5 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
   1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: As indicated on the drawings.

2.2 STRAIGHT BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.

2.3 GFCI RECEPTACLES

A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

2.4 WALL PLATES

A. Single and combination types to match corresponding wiring devices.
   1. Plate-Securing Screws: Metal with head color to match plate finish.
   2. Material for Finished Spaces: Smooth, brushed stainless steel.
   3. Material for Unfinished Spaces: Galvanized steel.
   4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover and listed and labeled for use in "wet locations."

2.5 FINISHES

A. Color: Wiring device catalog numbers in Section text or material schedules do not always designate device color.
   1. Wiring Device colors shall be chosen by architect from manufacturers' standard color selections.
   2. Coordinate selection of wiring device colors.
   3. Brushed stainless steel cover plate selection shall be verified with Architect prior to ordering materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:

1. Take steps to ensure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
   a. Cut back and pigtail or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring clamp terminal with tightening screw. Insert stripped wire end to full depth of clamp socket.

6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.

3.2 IDENTIFICATION

A. Comply with Division 26 Section "Identification for Electrical Systems."
1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with clear background with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

A. Tests for Convenience Receptacles:
1. Ground Impedance: Values of up to 2 ohms are acceptable.
2. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
3. Using the test plug, verify that the device and its outlet box are securely mounted.
4. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION 262726

SECTION 312010 - EARTH MOVING FOR STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. See HVAC Drawings for earth moving requirements for the site (i.e., approximately five feet outside of the building footprint).

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for slabs-on-grade.
2. Excavating and backfilling for buildings and structures.
3. Excavating and backfilling trenches for utilities and pits for buried utility structures within building limits.
4. Testing

B. Related Sections:
1. Section 015000 "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities; also for temporary site fencing if not in another Section.
2. Section 033000 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
3. Divisions 23 and 26Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

D. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

E. Fill: Soil materials used to raise existing grades.

F. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m)for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

I. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 698.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications engaged and paid for by Owner): Qualified according to ASTM E 329 and ASTM D 3740 for testing indicated.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

C. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures, specified in Section 015000 "Temporary Facilities and Controls," and Section 311000 "Site Clearing," are in place.

D. The following practices are prohibited within protection zones (around existing trees and plants):

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

E. Do not direct vehicle or equipment exhaust towards protection zones.

F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of

rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

1. Liquid Limit: 45 or less.
2. Plasticity Index: 25 or less.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within -2 and +3 percentage points of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

G. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

H. Sand: ASTM C 33; fine aggregate.

I. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:

1. Portland Cement: ASTM C 150, Type I.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/4-inch (19-mm) nominal maximum aggregate size.
4. Water: ASTM C 94/C 94M.
5. Air-Entraining Admixture: ASTM C 260.

B. Produce conventional-weight, controlled low-strength material with 140-psi (965-kPa)compressive strength when tested according to ASTM C 495.

2.3 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
1. Provide, pay for, and maintain appropriate pumping equipment as is necessary to keep excavations free of standing water.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches (600 mm) outside of concrete forms other than at footings.
b. 12 inches (300 mm) outside of concrete forms at footings.
c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
f. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:

a. 24 inches (600 mm) outside of concrete forms other than at footings.
b. 12 inches (300 mm) outside of concrete forms at footings.
c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.

d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
f. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches (300 mm) each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 4 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 SUBGRADE INSPECTION

A. Notify Architect and Owner's Representative when excavations have reached required subgrade.

B. If Owner's Representative determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof-roll subgrade below the building slabs with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 25 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction. Limit vehicle speed to 3 mph (5 km/h).
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for, via Change Order, according to Contract provisions for changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.8 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi (17.2 MPa), may be used when approved by Architect.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.9 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 "Cast-in-Place Concrete"

D. Backfill voids with satisfactory soil while removing shoring and bracing.

E. Place and compact initial backfill of satisfactory soil, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit. Coordinate backfilling with utilities testing.

G. Place and compact final backfill of satisfactory soil to final subgrade elevation.

H. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

I. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.12 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under steps and ramps, use engineered fill.
   2. Under building slabs, use engineered fill.
   3. Under footings and foundations, use engineered fill.

C. Under footings and foundations, use select granular fill, see following paragraph “COMPACTION OF SOIL BACKFILLS AND FILLS.”

3.13 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

   1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Beneath footings, if weaker soil deposits are exposed at the design bearing elevation or are within a depth equivalent to the foundation width below the bearing elevation, they are to be removed and replaced with select granular fill.

   1. The width of foundation undercuts should exceed footing dimensions by at least 6 inches along each side for every foot of overdig as measured at the base of the excavation. Replacement material should consist of crushed limestone having a maximum size of 3 inches and a minimum size of 1/4 inch and containing no fines. Illinois Department of Transportation (IDOT) gradation specifications for CA-1, CA-3, CA-5 and CA-7 meet these criteria. The structural fill should be spread in 12 inch layers loose thickness with each layer densified using vibratory compaction equipment. Each lift of should be observed and tested.

D. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:

1. Under structures and building slabs, , scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 97 percent.
2. For utility trenches, compact each layer of initial and final backfill soil material at 97 percent.

3.15 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.16 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage and pay for a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities, in addition to the tests below. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect. Additional tests will be performed at the following locations and frequencies:
1. Isolated Spread Footings: At least one test for every location.
2. Continuous Wall Footings: at least on test for every 20 feet or less of wall length, but no fewer than two tests.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 1000 sq. ft. (186 sq. m) or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 20 feet or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 100 feet (46 m) or less of trench length, but no fewer than two tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

D. Comply with requirements of Storm Water Pollution Prevention Plan (SWPPP).

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312010

ATTACHMENT A.6
INSURANCE REQUIREMENTS
ROUTINE CONSTRUCTION, MAINTENANCE AND REPAIR PROJECTS

Contractor shall obtain insurance of the types and in the amounts listed below.

A. COMMERCIAL GENERAL AND UMBRELLA LIABILITY INSURANCE

Contractor shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella insurance with a limit of not less than $1,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location.

CGL insurance shall be written on Insurance Services Office (ISO) occurrence form CG 00 01 10 93, or a substitute form providing equivalent coverage, and shall cover liability arising from premises, operations, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract (including the tort liability of another assumed in a business contract).

Owner shall be included as an insured under the CGL, using ISO additional insured endorsement CG 20 10 or a substitute providing equivalent coverage, and under the commercial umbrella, if any. This insurance shall apply as primary insurance with respect to any other insurance or self-insurance afforded to Owner.

There shall be no endorsement or modification of the CGL limiting the scope of coverage for liability arising from pollution, explosion, collapse, or underground property damage.

B. CONTINUING COMPLETED OPERATIONS LIABILITY INSURANCE

Contractor shall maintain commercial general liability (CGL) and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each occurrence for at least one (1) year following substantial completion of the work.

Continuing CGL insurance shall be written on ISO occurrence form CG 00 01 10 93, or substitute form providing equivalent coverage, and shall, at minimum, cover liability arising from products-completed operations and liability assumed under an insured contract.

Continuing CGL insurance shall have a products-completed operations aggregate of at least two times its each occurrence limit.

Continuing commercial umbrella coverage, if any, shall include liability coverage for damage to the insured's completed work equivalent to that provided under ISO form CG 00 01.

C. BUSINESS AUTO AND UMBRELLA LIABILITY INSURANCE

Contractor shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each accident. Such insurance shall cover liability arising out of any auto including owned, hired and non-owned autos.

Business auto insurance shall be written on Insurance Services Office (ISO) form CA 00 01, CA 00 05, CA 00 12, CA 00 20, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01.

D. WORKERS COMPENSATION INSURANCE

Contractor shall maintain workers compensation as required by statute and employers liability insurance. The commercial umbrella and/or employers liability limits shall not be less than $1,000,000 each accident for bodily injury by accident or $1,000,000 each employee for bodily injury by disease.

If Owner has not been included as an insured under the CGL using ISO additional insured endorsement CG 20 10 under the Commercial General and Umbrella Liability Insurance required in this Contract, the Contractor waives all rights against Owner and its officers, officials, employees, volunteers and agents for recovery of damages arising out of or incident to the Contractor's work.

E. GENERAL INSURANCE PROVISIONS

1. Evidence of Insurance. Prior to beginning work, Contractor shall furnish Owner with a certificate(s) of insurance and applicable policy endorsement(s), executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements set forth above.

All certificates shall provide for 30 days written notice to Owner prior to the cancellation or material change of any insurance referred to therein. Written notice to Owner shall be by certified mail, return receipt requested.

Failure of Owner to demand such certificate, endorsement or other evidence of full compliance with these insurance requirements or failure of Owner to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

Owner shall have the right, but not the obligation, of prohibiting Contractor or any subcontractor from entering the project site until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by Owner.

Failure to maintain the required insurance may result in termination of this Contract at Owner's option.

With respect to insurance maintained after final payment in compliance with a requirement above, an additional certificate(s) evidencing such coverage shall be promptly provided to Owner whenever requested.

Contractor shall provide certified copies of all insurance policies required above within 10 days of Owner's written request for said copies.

2. Acceptability of Insurers. For insurance companies which obtain a rating from A.M. Best, that rating should be no less than A VII using the most recent edition of the A.M. Best's Key Rating Guide. If the Best's rating is less than A VII or a Best's rating is not obtained, the Owner has the right to reject insurance written by an insurer it deems unacceptable.

3. Cross-Liability Coverage. If Contractor's liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

4. Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to the Owner. At the option of the Owner, the Contractor may be asked to eliminate such deductibles or self insured retentions as respects the Owner, its officers, officials, employees, volunteers and agents or required to procure a bond guaranteeing payment of losses and other related costs including but not limited to investigations, claim administration and defense expenses.

5. Subcontractors. Contractor shall cause each subcontractor employed by Contractor to purchase and maintain insurance of the type specified above. When requested by the Owner, Contractor shall furnish copies of certificates of insurance evidencing coverage for each subcontractor.

F. INDEMNIFICATION

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner and the Architect and their officers, officials, employees, volunteers and agents from and against all claims, damages, losses and expenses including but not limited legal fees (attorney's and paralegal's fees and court costs), arising

out of or resulting from the performance of the Contractor's work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property, other than the work itself, including the loss of use resulting therefrom and (2) is caused in whole or I part by any wrongful or negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except to the extent it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph. Contractor shall similarly protect, indemnify and hold and save harmless the Owner, its officers, officials, employees, volunteers and agents against and from any and all claims, costs, causes, actions and expenses including but not limited to legal fees, incurred by reason of Contractor's breach of any of its obligations under, or Contractor's default of, any provision of the Contract.

SAMPLE LIABILITY INSURANCE ENDORSEMENT

The following spaces preceded by an asterisk (*) need not be completed if this endorsement and policy have the same inception date.

ATTACHED TO AND FORMING PART OF POLICY NUMBER	*EFFECTIVE DATE OF ENDORSEMENT	*ISSUED TO

This endorsement changes the policy. Please read it carefully.

AUTOMATIC ADDITIONAL INSUREDS

The following provision is added to (SECTION II), Who Is An Insured.

5. Any entity you are required in a written contract (hereinafter called Additional Insured) to name as an insured is an insured but only with respect to liability arising out of your premises, "your work" for the Additional Insured, or acts or omissions of the Additional Insured in connection with the general supervision of "your work" to the extent set forth below.

a. The Limits of Insurance provided on behalf of the Additional Insured are not greater than those required by such contract.

b. The coverage provided to the Additional Insured(s) is not greater than that customarily provided by the policy forms specified in and required by the contract.

c. All insuring agreements, exclusions and conditions of this policy apply.

d. In no event shall the coverages or Limits of Insurance in this Coverage Form be increased by such contract.

Except when required otherwise by contract, this insurance does not apply to:

1) "Bodily injury" or "property damage" occurring after

a) All work on the project (other than service, maintenance or repairs) to be performed by or on behalf of the Additional Insured(s) at the site of the covered operations has been completed; or

b) That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

2) "Bodily injury" or "property damage" arising out of any act or omission of the Additional Insured(s) or any of their employees, other than the general supervision of work performed for the Additional Insured(s) by you.

3) "Property damage" to

a) Property owned, used or occupied by or rented to the Additional Insured(s);

b) Property in the care, custody or control of the Additional Insured(s) or over which the Additional Insured(s) is for any purpose exercising physical control; or

c) “Your work” for the Additional Insured(s).

With respect to Additional Insureds who are architects, engineers or surveyors, this insurance does not apply “bodily injury”, “property damage”, “personal injury” or “advertising injury” arising out of the rendering of or the failure to render any professional services by or for you, including:

a) The preparing, approving, or failing to prepare or approve maps, drawings, opinions, reports, surveys, change orders, designs or specifications; and

b) Supervisory, inspection or engineering services.

Any coverages provided hereunder shall be excess over any other valid and collectible insurance available to the Additional Insured(s) whether primary, excess, contingent or on any other basis unless a contract specifically requires that this insurance be primary or you request that it apply on a primary basis.

No person or organization is an Additional Insured with respect to the conduct of any current or past partnership or joint venture that is not shown as a Named Insured in the Declarations.

END OF ATTACHMENT A.6

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER

600 NE WATER ST.
Peoria, IL 61603

DATE: 15 DECEMBER 2020

PROJECT No.: 2015904.19

MECHANICAL ENGINEER

ApaceDesign ARCHITECTS + ENGINEERS
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Peoria, IL 61614
tel 309.685.4722
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markc@apacedesign.com

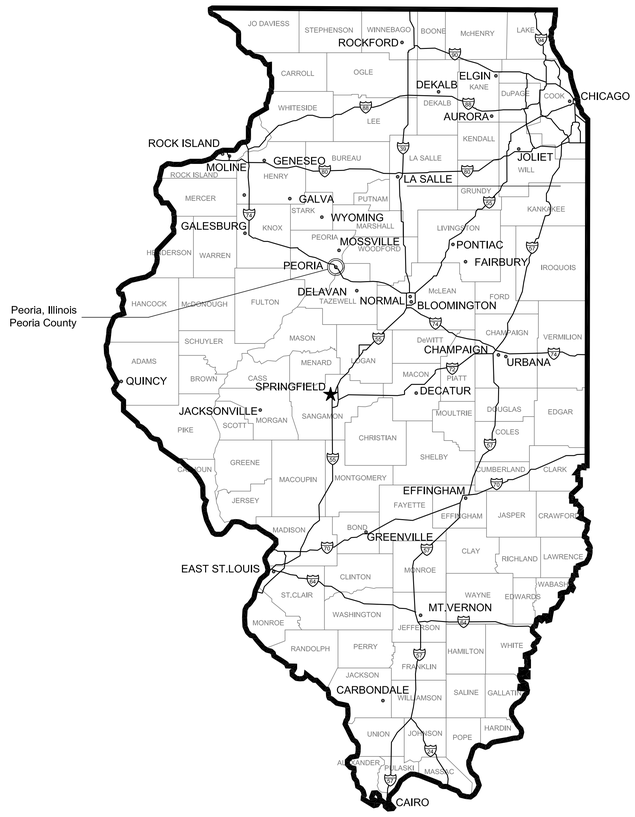
STRUCTURAL ENGINEER

Hanson Professional Services Inc.
7625 N. University St. Suite 200
Peoria, IL 61614

tel 309.691.0902

ELECTRICAL ENGINEER

Keith Engineering Design
207 NE Jefferson Ave.
Peoria, IL 61603
tel 309.938.4005



Location in State
not to scale

ABBREVIATIONS:

A.D.A.	AMERICANS WITH DISABILITIES ACT
A.F.F.	ABOVE FINISHED FLOOR
ALT.	ALTERNATE
APPROX.	APPROXIMATE
BRNG.	BEARING
B.O.	BY OWNER
℄	CENTER LINE
C/C	CENTER-TO-CENTER
CLNG.	CEILING
CLR.	CLEAR (ANCE)
COL(S).	COLUMN (S)
COMP.	COMPRESSED; COMPACTED
CONC.	CONCRETE
CONSTR.	CONSTRUCTION
CONT.	CONTINUE (OUS)
COORD.	COORDINATE
DP.	DEEP
DEMO	DEMOLITION
DET.	DETAIL
DIA.	DIAMETER
DR. (S)	DOOR (S)
D.S.	DOWNSPOUT
DN.	DOWN
EA.	EACH
E.F.	EXHAUST FAN
ELEC.	ELECTRICAL
EL.; ELEV. (S)	ELEVATION (S)
EQ.	EQUAL
EQUIP.	EQUIPMENT
EXIST. (E)	EXISTING
F.D.	FLOOR DRAIN; FILE DRAWER
FDN.	FOUNDATION
F.E.C.	FIRE EXTINGUISHER CABINET
FIN.	FINISHED (ED)
FLR. (NG)	FLOOR (ING)
F.R.P.	FIBERGLASS RE-INFORCED PANEL
FTG.	FOOTING
GA.	GAUGE
GALV.	GALVANIZED
GYP.	GYPSUM
H.	HIGH
HGT.	HEIGHT
HR.	HOUR
HORIZ.	HORIZONTAL
JNT.	JOINT
INSUL.	INSULATION
L.	LENGTH
L.F.	LINEAR FEET
MANUF.	MANUFACTURE (R)
MAS.	MASONRY
MAX.	MAXIMUM
MECH.	MECHANICAL
MIN.	MINIMUM
MISC.	MISCELLANEOUS
MTL.; MET.	METAL
MNTD.	MOUNTED
No.	NUMBER
N.I.C.	NOT IN CONTRACT
O.C.	ON CENTER
OPNG.	OPENING
OPP.	OPPOSITE
O.D.	OUTSIDE DIAMTER
PLUMB.	PLUMBING
PLYWD.	PLYWOOD
PNT.; PT.	PAINT
P.C.	PORTLAND CEMENT
RAD.	RADIUS
REINF.	REINFORCE (D); (ING)
REQ'D.	REQUIRED
REF.	REFERENCE
RM.	ROOM
SCHED.	SCHEDULE (D)
SLNT.	SEALANT
S.F.	SQUARE FEET
SHT.	SHEET
SIM.	SIMILAR
SPEC.	SPECIFICATION (S)
SQ.	SQUARE
S.STL.	STAINLESS-STEEL
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURAL
SUSP.	SUSPENDED
T.	TALL
T+G	TONGUE-AND-GROOVE
T.B.	TACK BOARD
T.B.R.	TO BE REMOVED
THK.	THICK (NESS)
T.O.	TOP OF
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
VERT.	VERTICAL
VEST.	VESTIBULE
W.W.F.	WELDED WIRE FABRIC
W.	WIDTH
W/	WITH
WIN. (S)	WINDOW (S)
W/O	WITHOUT
WD.	WOOD

INDEX OF DRAWINGS

BIDDING DOCUMENTS

GENERAL NOTES: APPLY TO ALL SHEETS

1. ANY DAMAGE OR DIRTINESS CAUSED BY THE CONTRACTOR WITHIN THE BUILDING SHALL BE PROMPTLY REPAIRED AND CLEANED UP. KEEP ADJACENT AREAS CLEAN AND FREE OF DEBRIS ON A DAILY BASIS.
2. CONTRACTOR SHALL HAVE ACCESS TO OWNER FRESH WATER AND ELECTRICAL POWER SUPPLIES, AS LONG AS SUCH ACCESS DOES NOT INTERRUPT OR OTHERWISE DISTURB ANY OWNER USE OF EXISTING FACILITIES AND CONTRACTOR PROVIDES ANY AND ALL APPURTENANCES AND ACCESSORIES NECESSARY FOR THE PROPER AND LAWFUL USE OF THESE FRESH WATER AND ELECTRICAL POWER SUPPLIES.
3. PROTECT ADJACENT PROPERTY AND STRUCTURES TO PREVENT DAMAGE OR ACCUMULATION OF DEBRIS.
4. NO BURNING OR INCINERATION OF RUBBISH WILL BE PERMITTED ON SITE.
5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY DISCREPANCY ON THE DRAWINGS OR THE UNCOVERING OF HIDDEN CONDITIONS WHICH AFFECT THE WORK.
6. CONTRACTOR SHALL NOT CAUSE OR IMPOSE EXCESSIVE LOADS ON THE STRUCTURE.
7. DETAILS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR IN CHARACTER TO COMPARABLE CONDITIONS DETAILED. IF SPECIFIC DIMENSIONS, DETAILS, OR DESIGN INTENT CANNOT BE DETERMINED FOR ANY CONDITION, CONSULT THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH WORK.
8. ANY AREA OUTSIDE THE WORK AREA SHOWN USED BY THE GENERAL OR HIS/HER SUB-CONTRACTOR(S) SHALL BE RETURNED TO THE STATE IT WAS FOUND PRIOR TO THIS WORK.
9. ALL WORK OF THE PROJECT SHALL BE PROVIDED IN COMPLETE ACCORDANCE WITH THE 2018 IECC, 2012 IBC FAMILY OF CODES; AS WELL AS CITY OF PEORIA AND PEORIA COUNTY CODES AND ORDINANCES; AND SHALL BE CAREFULLY COORDINATED.
10. ALL ITEMS SHOWN OR CALLED OUT WITHIN THIS CONSTRUCTION DRAWING SET ARE CONTRACTOR PROVIDED (FURNISHED/INSTALLED), UNLESS OTHERWISE NOTED.
11. CONTRACTOR SHALL COORDINATE ANY AND ALL WORK WITH ALL CORRESPONDING TRADES AND OWNER-PURCHASED EQUIPMENT AS REQUIRED.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DEMOLITION OF EXISTING CONSTRUCTION REQUIRED FOR INSTALLATION OF ANY NEW PRODUCTS OR NEW CONSTRUCTION WHETHER CALLED OUT ON THESE DRAWINGS OR NOT. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PATCHING OF EXISTING CONSTRUCTION WITH NEW CONSTRUCTION MATERIALS TO MATCH IN THEIR ENTIRETY WHETHER CALLED OUT OR NOT. A FINISHED APPEARANCE IS EXPECTED.
13. ALL DIMENSIONS, CEILING HEIGHTS, ELEVATIONS, AND EXISTING CONDITIONS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR BEFORE BIDDING. THESE DRAWINGS ARE NOT INTENDED TO DEPICT EACH AND EVERY DETAIL OF THE PROJECT. AS THE PARTY IN THE FIELD, THE CONTRACTOR IS IN THE BEST POSITION TO VERIFY THAT ALL CONDITIONS ARE COMPLETED TO PROVIDE A FULLY OPERATIONAL AND COMPLETE FACILITY. THE CONTRACTOR SHALL DO SO.
14. CONTRACTOR SHALL ACQUIRE ALL PERMITS AND ZONING CERTIFICATES THAT ARE REQUIRED BY THE LOCAL AUTHORITIES. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE REQUIREMENTS OF ALL APPLICABLE LOCAL, STATE, AND FEDERAL LAWS, REGULATIONS, RULES AND CODES, UNLESS OTHERWISE SPECIFICALLY SPECIFIED.
15. ALL ITEMS INDICATED TO BE REMOVED SHALL BE REMOVED IN THEIR ENTIRETY, INCLUDING ANY ACCESSORIES, RELATED ACCESSORIES, OR PARTS, UNLESS OTHERWISE NOTED.
16. CONSTRUCTION REFUSE SHALL BE REMOVED FROM THE SITE AT THE END OF EACH DAY.
17. ALL NEW CONSTRUCTION SHALL BE FULLY PROTECTED FROM ANY AND ALL DAMAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR FULL REPAIR TO ORIGINAL CONDITION OF ANY SUCH CONSTRUCTION DAMAGED.
18. STORAGE OF MATERIALS AND SUPPLIES, INCLUDING HAZARDOUS MATERIALS AND GLYCOL, SHALL BE LAWFULLY STORED THROUGHOUT THE DURATION OF THE PROJECT.
19. CONTRACTOR AND SITE SUPERINTENDENT SHALL BE ACCESSIBLE BY CELL PHONE DURING NORMAL WORKING HOURS THROUGHOUT THE DURATION OF THE PROJECT.
20. ALL MANUFACTURERS PRODUCTS AND SYSTEMS SPECIFIED SHALL BE USED UNLESS AN EQUAL IS APPROVED BY ENGINEER AND OWNER PRIOR TO BIDDING.
21. ALL MATERIALS, PRODUCTS, AND SYSTEMS SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS, U.O.N..
22. CONTRACTOR SHALL PROVIDE LIFTING AND TRANSPORT EQUIPMENT TO REMOVE EXISTING ACCU AND AHU AND INSTALL AND INSTALL NEW AHU AND FLUID COOLER AT LOCATIONS SHOWN WITH MINIMAL ABSOLUTE DAMAGE TO THE EXISTING PARK & PEDESTRIAN ROADWAY AREA. PROVIDE TEMPORARY PADS FOR SUPPORT OF CRANE SUPPORT FEET AND SUFFICIENT FLOTATION TIRED DEVICES TO AVOID RUTTING LAWN OR DAMAGING WALKWAY.
23. OWNER WILL BE SERVICING AND COMPLETING MAINTENANCE ON EQUIPMENT WITHIN THE PROJECT LIMITS. COORD. W/ OWNER.
24. ALL DIMENSIONS, CEILING HEIGHTS, ELEVATIONS, ETC. ARE APPROXIMATE AND SHOULD BE VERIFIED BY THE CONTRACTOR BEFORE BIDDING. THERE WILL BE NO ADDITIONAL COST REIMBURSEMENT FOR ANY SUCH ERROR IN QUANTITIES BY THE CONTRACTOR.

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TITLE SHEET

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	100 REVIEW	12.15.20
2	BID DOCUMENTS	12.15.20
3		

MARK A. CORDES
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2-2-21

EXPIRES 11.30.21 "H"
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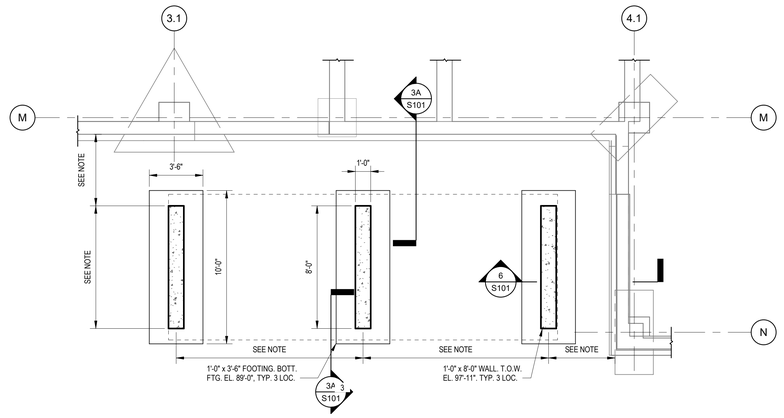
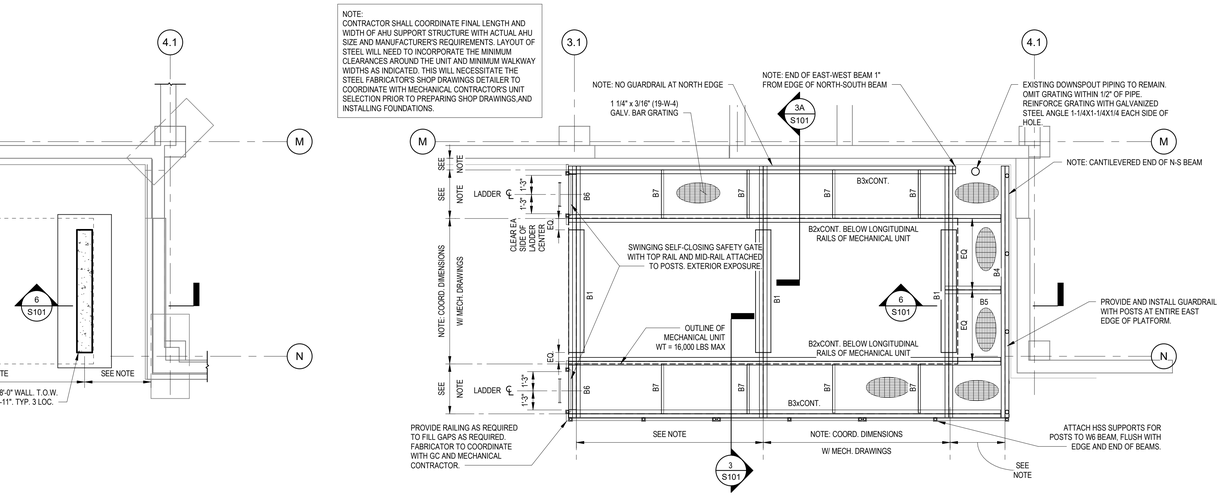
SHEET	G000
	1 OF 1

NOTE:
CONTRACTOR SHALL COORDINATE FINAL LENGTH AND WIDTH OF AHU SUPPORT STRUCTURE WITH ACTUAL AHU SIZE AND MANUFACTURER'S REQUIREMENTS. LAYOUT OF STEEL WILL NEED TO INCORPORATE THE MINIMUM CLEARANCES AROUND THE UNIT AND MINIMUM WALKWAY WIDTHS AS INDICATED. THIS WILL NECESSITATE THE STEEL FABRICATOR'S SHOP DRAWINGS DETAILER TO COORDINATE WITH MECHANICAL CONTRACTOR'S UNIT SELECTION PRIOR TO PREPARING SHOP DRAWINGS,AND INSTALLING FOUNDATIONS.



1 PARTIAL FOUNDATION PLAN VIEW
1/4" = 1'-0"



2 PARTIAL FRAMING PLAN VIEW
1/4" = 1'-0"

PLAN NORTH
TRUE NORTH

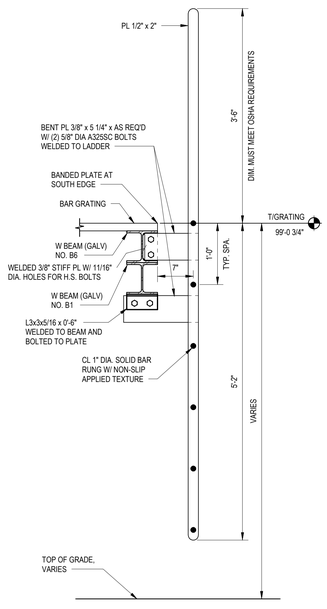
BEAM LEGEND

ALL BEAMS: W6x20 GALVANIZED UNLESS NOTED OTHERWISE.
B1: BEAMS ARE BELOW.
B2: BEAMS ARE CONTINUOUS, NOT SPLICED, SUPPORTING AHU CONNECTED TO B1 WITH (4) 5/8" Ø A325 BOLTS CONNECTING THRU FLANGES.
B3: BEAMS ARE CONTINUOUS, NOT SPLICED, CONNECTED TO B1 WITH (4) 5/8" DIA. A325 BOLTS CONNECTING THRU FLANGES.
B4, B5, B6: SHEAR TAB CONNECTIONS WITH ONLY ONE SIDE ACCESSIBLE AT SOME LOCATIONS.
B7: C6X8.2 GALVANIZED, EQUALLY SPACED SUPPORTING GRATING. SHEAR TAB CONNECTIONS, ONE SIDE.

NOTE: BEAMS B2 THRU B7 ARE ALL AT SAME ELEVATION, BOTTOM OF GRATING.

3 3A SECTION
1" = 1'-0" (DET. 3A AS NOTED)

4 SECTION AT GUARD POST
1" = 1'-0" (SOUTH AND WEST SIDES)



5 SECTION AT LADDERS LOCATED AT WEST END (TWO LOCATIONS)
1" = 1'-0"

6 SECTION AT EAST END
1" = 1'-0"

STRUCTURAL GENERAL NOTES

CONCRETE

1. SEE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL SLEEVES, INSERTS, EQUIPMENT PADS, EMBEDDED ITEMS, ETC.
2. ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,500 PSI.
3. ALL REINFORCEMENT BARS SHALL CONFORM TO ASTM: A615, GRADE 60.
4. ALL REINFORCEMENT SHALL BE FABRICATED IN ACCORDANCE WITH ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT. REINFORCEMENT SHALL BE CLEAN AND FREE OF GREASE, SCALING, AND RUST.

STRUCTURAL STEEL

1. ALL DETAILING, FABRICATION, AND ERECTION OF STRUCTURAL STEEL MEMBERS SHALL BE IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS," 14TH EDITION.
2. STRUCTURAL STEEL SHALL BE AS FOLLOWS:
   A. WIDE FLANGE SECTIONS: ASTM A992, GRADE 50 KSI.
   B. OTHER SHAPES: BARS, ANGLES, AND PLATES: ASTM A36 UNLESS NOTED OTHERWISE.
3. ALL HSS (HOLLOW STRUCTURAL SECTIONS) SHALL BE AS FOLLOWS:
   A. SQUARE AND RECTANGULAR SECTIONS: ASTM A 500, GRADE B (46 KSI).
   B. ROUND SECTIONS: ASTM A53, TYPE E (35 KSI).
4. ALL STEEL, FASTENERS, AND GRATING SHALL BE GALVANIZED.
5. ALL BOLTED CONNECTIONS SHALL BE MADE WITH ASTM A325 H.S. BOLTS UNLESS NOTED OTHERWISE.
6. ANY BOLTS DESIGNATED AS SLIP-CRITICAL (SC) SHALL BE LOAD INDICATOR TYPE BOLTS.
7. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH AWS SPECIFICATION D1.1. BY AWS CERTIFIED WELDERS. WELD MATERIALS COMPATIBLE WITH MATERIALS BEING WELDED.
8. OPENINGS REQUIRED IN STRUCTURAL STEEL MEMBERS SHALL BE SHOWN ON THE SHOP DRAWINGS. FIELD CUTTING OF HOLES IN THE STRUCTURAL STEEL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION OF THE ENGINEER.
9. WHENEVER CONSTRUCTION SCHEDULING REQUIRES THE ERECTION OF STRUCTURAL MEMBERS WHICH BY THEMSELVES WOULD BE CONSIDERED LATERALLY UNSTABLE, ADEQUATE TEMPORARY BRACING SHALL BE PROVIDED.
10. CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE SELECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. TYPE 2 FRAMING CONNECTIONS USING BEARING TYPE ½" DIA. ASTM-A325N BOLTS UNLESS OTHERWISE NOTED. COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS OR TWIST-OFF TENSION-CONTROL BOLTS CONFORMING TO RCSC SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS SHALL BE PROVIDED AT ALL BOLTED CONNECTIONS.

EPOXY

1. THE EPOXY SHALL BE A TWO COMPONENT, EPOXY RESIN BONDING SYSTEM CONFORMING TO THE REQUIREMENTS OF ASTM DESIGNATION: C 881, TYPE IV AND V, GRADE 2, CLASS C. SUBMIT INFORMATION ON EPOXY MATERIAL TO ENGINEER FOR APPROVAL.
2. DRILL HOLES IN EXISTING CONCRETE, THEN REPEATEDLY WIRE BRUSH HOLES CLEAN AND REMOVE DUST WITH COMPRESSED AIR, UNTIL THE HOLE IS COMPLETELY CLEAN. ANCHOR DOWEL BARS WITH ADHESIVE. FOLLOW ALL ADDITIONAL MANUFACTURER'S INSTRUCTIONS.

SUBMITTALS

1. CONCRETE MIX DESIGN(S): INCLUDING MATERIAL CERTIFICATES FOR CEMENTITOUS MATERIALS AND ADMIXTURES AND MATERIAL TEST REPORTS FOR AGGREGATES.
2. STEEL REINFORCEMENT SHOP DRAWINGS: PLACING DRAWINGS THAT DETAIL FABRICATION, BENDING, AND PLACEMENT. INCLUDE BAR SIZES, LENGTHS, MATERIAL, GRADE, BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, BAR ARRANGEMENT, SPLICES AND LAPS, MECHANICAL CONNECTIONS, TIE SPACING, HOOP SPACING, AND SUPPORTS FOR CONCRETE REINFORCEMENT.
3. STRUCTURAL STEEL SHOP DRAWINGS: SHOW FABRICATION OF STRUCTURAL STEEL COMPONENTS
   A. INCLUDE DETAILS OF CUTS, CONNECTIONS, SPLICES, CAMBER, HOLES, AND OTHER PERTINENT DATA.
   B. INCLUDE EMBEDMENT DRAWINGS.
   C. INDICATE WELDS BY STANDARD AWS SYMBOLS, DISTINGUISHING BETWEEN SHOP AND FIELD WELDS, AND SHOW SIZE LENGTH, AND TYPE OF EACH WELD. SHOW BACKING BARS THAT ARE TO BE REMOVED AND SUPPLEMENTAL FILLET WELDS WHERE BACKING BARS ARE TO REMAIN.
   D. INDICATE TYPE, SIZE, AND LENGTH OF BOLTS, DISTINGUISHING BETWEEN SHOP AND FIELD BOLTS. IDENTIFY PRETENSIONED AND SLIP-CRITICAL HIGH-STRENGTH BOLTED CONNECTIONS.
4. FLOOR GRATING SHOP DRAWINGS AND PRODUCT DATA.
5. SELF-CLOSING GATE PRODUCT AND INSTALLATION DATA.

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STRUCTURAL PLANS, DETAILS, AND NOTES
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NO.	ISSUE	DATE
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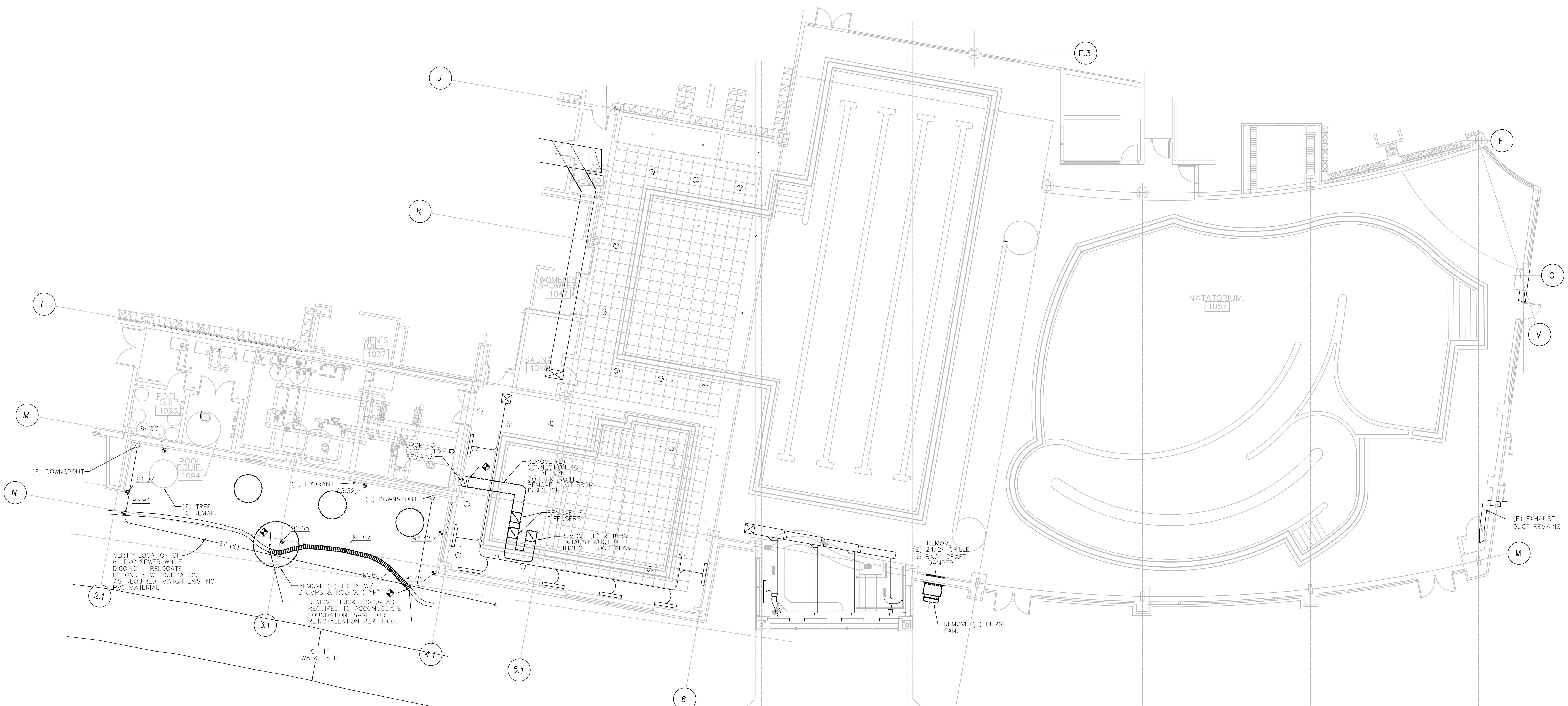
THOMAS N. DEJARLD
81-4730
LICENSED STRUCTURAL ENGINEER
exp. 11.30.22

DATE 12.15.2020	PROJECT NO. 2015604.19
DRAWN BY ABK	SHEET S101
CHECKED TND	
APPROVED TND	1 OF 1

SYMBOLS AND ABBREVIATIONS – APPLIES TO BOTH DEMOLITION SHEETS

Symbol	Meaning
(E)	EXISTING
RA	RETURN AIR
TYP	TYPICAL
ST	STORM WATER PIPE
O.A.	OUTDOOR AIR
----	REMOVE ITEMS DRAWN WITH THIS LINEWORK
	POINT OF DISCONNECTION
	ELEVATION MARKER BASED ON MAIN FLOOR LEVEL = 100.00
	LIGHT FIXTURE
	SPEAKER
	FIRE SPRINKLER HEAD
	DROP FROM BOTTOM OF PIPE
	ELBOW DOWN
	ELBOW UP
—HWS—	HOT WATER SUPPLY
—HWR—	HOT WATER RETURN
—HG—	HOT GAS REFRIGERANT PIPE
—LIQ—	LIQUID REFRIGERANT PIPE



1 DH100 FIRST FLOOR DEMOLITION PLAN

1/8" = 1'-0"

PLAN NORTH TRUE NORTH

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MAIN LEVEL HVAC DEMOLITION PLAN

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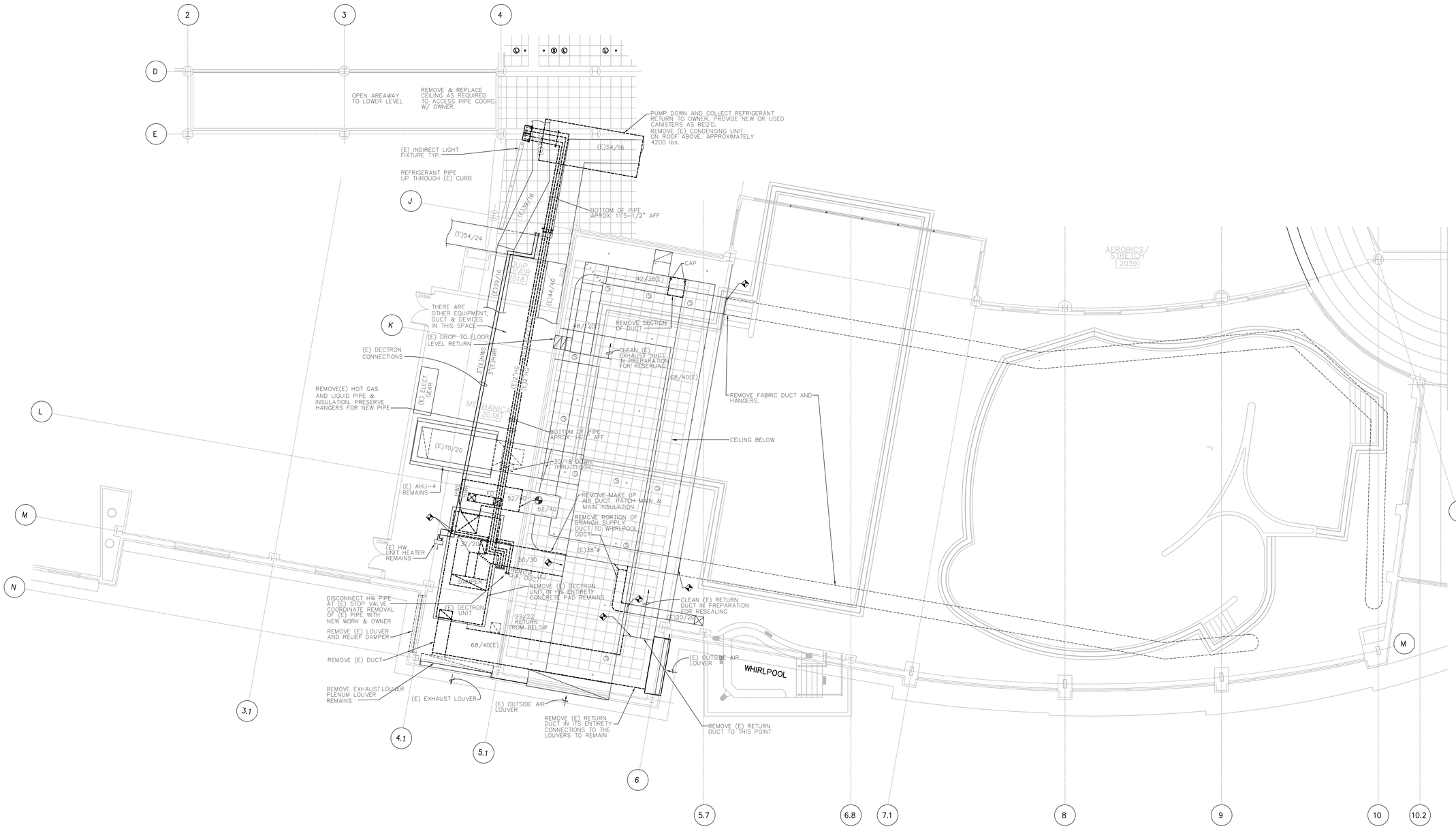
2-2-21

DATE 12.15.20	PROJECT NO. 2015904.19
DRAWN BY DAC	SHEET
CHECKED MAC	DH100
APPROVED MAC	1 OF 2



1 DH101 SECOND FLOOR DEMOLITION PLAN

1/8" = 1'-0"

1/8" = 1'-0" METERS 1 0 5 10 FEET

PLAN NORTH TRUE NORTH

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UPPER LEVEL HVAC DEMOLITION PLAN

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SHEET	DH101
	2 OF 2

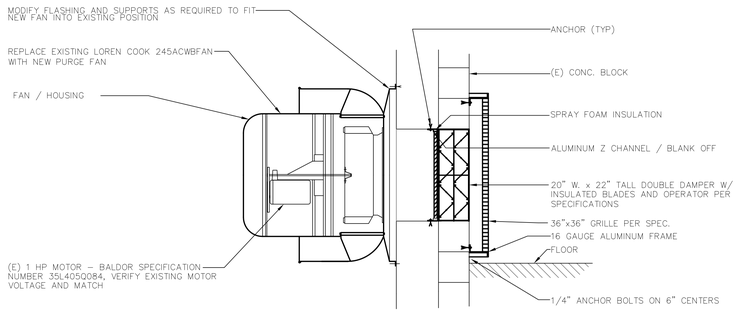
1 H100 FIRST FLOOR HVAC PLAN

1/8" = 1'-0"

1/8" = 1'-0"
0 METERS
1
2
0 FEET

PLAN NORTH

TRUE NORTH



2 H100 PURGE FAN MODIFICATION DETAIL

3/4" = 1'-0"

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MAIN LEVEL HVAC PLAN

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SHEET	H100
	1 OF 7

SYMBOLS AND ABBREVIATIONS – APPLIES TO ALL SHEETS

(E)	EXISTING
DN	DOWN
CFM	CUBIC FEET PER MINUTE
GPM	GALLONS PER MINUTE
	POINT OF DISCONNECTION
	POINT OF NEW CONNECTION
	VALVE IN PLAN
	DROP FROM BOTTOM OF PIPE
	ELBOW DOWN
	ELBOW UP
	FLEXIBLE DUCT; A"–DIAMETER
	RECTANGULAR TO ROUND TRANSITION
	DUCT TO REMAIN
	RECTANGULAR DUCT X WIDE x Y DEEP
	HARD ROUND DUCT; A"–DIAMETER
	DAMPER: VD = VOLUME DAMPER, MD = MOTORIZED DAMPER, FD = FIRE DAMPER
	RETURN DROP
	SUPPLY DROP
	SUPPLY DUCT RISER
	RETURN DUCT RISER
	TURNING VANES
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
PGR	PROPYLENE GLYCOL RETURN
PGS	PROPYLENE GLYCOL SUPPLY

GENERAL NOTES: (APPLY TO ALL SHEETS)

1 ALL DIFFUSERS, DRUM LOUVERS AND DAMPERS SHALL BE ACCESSIBLE FROM THE POOL DECK, WITH SCISSORS TYPE LIFTS.

2 SEE SPECIFICATIONS FOR REQUIREMENTS NOT SPECIFICALLY NOTED ON PLAN AND DETAIL DRAWINGS

3 EQUIPMENT AND DEVICES SUCH THAT FUTURE SERVICE WORK IS POSSIBLE. ALLOW A MINIMUM OF 15" FREE OF SUPPORTS AND OTHER IMPINGEMENTS ON ACCESS: DOORS AND CONTROL DEVICES. ALLOW SUFFICIENT SPACE FOR FILTER CHANGEOUT.

4 TEST AND BALANCE WORK SHALL BE PERFORMED IN ACCORD TO THE SPECIFICATION ASSOCIATED WITH THIS DRAWING

5 CONFIRM ALL DEVICES SHOWN ON H204 ARE INSTALLED IN SYSTEM.

6 REFERENCE ALL SPECIFICATION SECTIONS. SPECIFICATIONS HAVE INSTALLATION REQUIREMENTS THAT DO NOT NECESSARILY APPEAR ON THESE DRAWINGS

7 DO NOT PROVIDE AUTOMATIC AIR VENTS ON WATER PIPING THAT ARE NOT ISOLATED BY A MANUAL VALVE. AUTOMATIC AIR VENTS ARE NOT DESIRED FOR PERMANENT USE AND SO ARE NOT SPECIFIED.

8 "BULL HEADED" TEES ON WATER PIPE SHALL NOT BE INSTALLED.

KEY NOTES: APPLY TO H100 & H101

1 TWO DOUBLE DEFLECTION GRILLES. SIZE & AIR FLOW IN CFM PER ADJACENT NOTE. SEE DETAIL REFERENCED WITH THE NOTE NUMBER, NEW DUCT SHALL EXIT HORIZONTALLY WITH GRILLES BLOWING AT 90°

2 DOUBLE DEFLECTION GRILLE. SIZE & AIR FLOW IN CFM PER ADJACENT NOTE. SEE DETAIL REFERENCED WITH THE NOTE NUMBER, NEW DUCT SHALL DROP VERTICALLY WITH GRILL OR GRILLES BLOWING HORIZONTALLY.

3 DOUBLE DEFLECTION GRILLE. SIZE & AIR FLOW IN CFM PER ADJACENT NOTE. SEE DETAIL REFERENCED WITH THE NOTE NUMBER, NEW DUCT SHALL EXIT HORIZONTALLY WITH GRILL BLOWING OUT WITH END.

4 NEW DUCT DROP CONNECTION. SEE DETAIL TAKE OFF DIRECTION & SIZE PER ADJACENT NOTES.

5 CEILING DIFFUSER IN LAY–IN PAN; SIZE AND AIR FLOW AND FLOW DIRECTION PER ADJACENT NOTE; CONNECT PER DETAIL.

6 RECTANGULAR FRAME DRUM LOUVER ON RECTANGULAR BRANCH TAKE OFFS WITH MANUAL VOLUME DAMPER. BRANCH. TAKE OFFS SHALL BE 45° SIZED FOR MINIMUM OF 25% ADDITIONAL AREA OF DUCT. ALLOW MINIMUM 12" BETWEEN BACK OF DRUM LOUVER AND TAKE OFF.

7 RECTANGULAR FRAME DRUM LOUVERS ON RECTANGULAR DUCT RISER POSITIONED 1/2 WAY BETWEEN DUCT & ROOF DECK EXCEPT AS NOTED. RISER SIZE PER PLAN NOTE. SIZE AND AIR FLOW PER ADJACENT NOTE. POSITION VANES AND LOUVER TO SWEEP CEILING.

8 RECTANGULAR FRAME DRUM LOUVER; MOUNT VERTICALLY POSITION VANES TO SWEEP LOWER WINDOWS OR WALLS; SIZE AND AIR FLOW PER ADJACENT NOTES.

9 RECTANGULAR FRAME DRUM LOUVER POSITION VANES TO SWEEP WALL & WINDOW BELOW DUCT. DIMENSION & CFM PER ADJACENT NOTES.

10 RECTANGULAR FRAME DRUM LOUVER POSITION VANES TO SWEEP WINDOW & ALL ABOVE. DUCT DIMENSION & CFM PER ADJACENT NOTES.

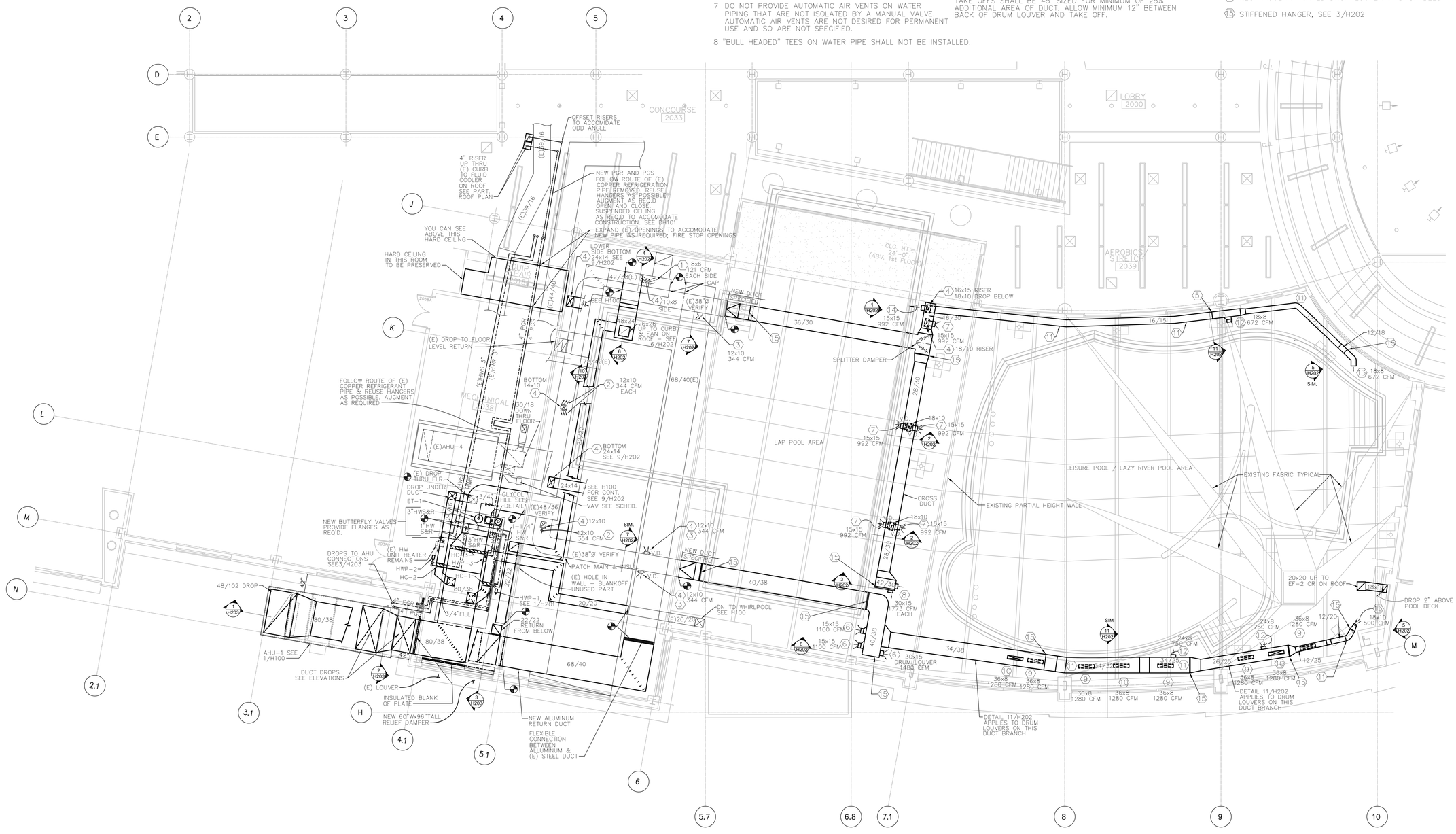
11 MEASURE ANGLE REQUIRED FOR ELBOW AND FABRICATE ESPECIALLY FOR THIS SITUATION

12 RECTANGULAR FRAME DRUM LOUVER WITH (+)25% HORIZONTAL TAKE OFF AND VOLUME DAMPER. POSITION TO SWEEP ROOF DECK

13 RECTANGULAR FRAME DRUM LOUVER. MOUNT VERTICALLY IN RECTANGULAR ADAPTOR BOX POSITION LOUVER AND VANES TO SWEEP WALL.

14 RECTANGULAR FRAMED DRUM LOUVER IN DROP BELOW MAIN, SEE 1/H202

15 STIFFENED HANGER, SEE 3/H202



1 H101 SECOND FLOOR HVAC PLAN

1/8" = 1'-0"

PLAN NORTH TRUE NORTH

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engineers
designers

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UPPER LEVEL HVAC PLAN

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	100% REVIEW	12.15.20
2	BID DOCUMENTS	12.15.20

MARK A. CORDES
062–039301
LICENSED
PROFESSIONAL
ENGINEER
ILLINOIS

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2-2-21

DATE	12.15.20
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APPROVED	MAC
SHEET	H101
	2 OF 7

1 / H102 ROOF PLAN

1/8" = 1'-0"

PLAN NORTH TRUE NORTH

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ROOF LEVEL HVAC PLAN

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CHECKED MAC	H102
APPROVED MAC	3 OF 7

POOL AHU / DEHUMIDIFIER UNIT

	DESIGNATION No				AHU-1
	POOL AREA VOLUME				466,000 CUBIC FT.
	POOL AREA FLOOR SPACE				13,300 SQ. FT.
	DATA ON POOLS IN SPACE				
	POOL NAME	THERAPY	WHIRL	LAP.	LEISURE
	POOL AREA	775 SQ. FT.	300 SQ. FT.	3066 SQ. FT.	3933 SQ. FT.
	POOL WATER TEMP.	94° F	104° F	81° F	84° F
	DESIGN SPACE TEMPERATURE				86° F
	DESIGN SPACE RELATIVE HUMIDITY				60%
SUPPLY FANS	PACKAGE UNIT WEIGHT				15,600 lbs
	AIR FLOW (CFM)				39200
	REQUIRED No OF FANS				2
	EXTERNAL STATIC PRESSURE (INCHES H20) 1.75				
	SIZE EACH FAN MOTOR (Hp)				20.0
	FAN MOTOR FULL LOAD AMPERES EACH				25.9
	FAN MOTOR DRIVE EACH				VFD
	FAN TYPE				PLENUM
	FAN DRIVE				DIRECT
	MINIMUM FAN SIZE				33"
DESIGN DATA	OUT DOOR AIR FLOW (CFM)				7070
	ROOM CONDITIONS °F DB / % R.H				86/60
	TOTAL AIR FLOW				39200
REFRIGERATION COMPRESSOR	REFRIGERANT CHARGE				176 lbs
	REFRIGERANT TYPE				410A
	COMPRESSOR TYPE				SCROLL
	MAX. NUMBER OF COMPRESSORS				2
	RUNNING LOAD AMPERES EACH COMP.				64.1
	DRIVE COMPRESSOR 1				2 SPEED
	DRIVE COMPRESSOR 2				2 SPEED
PUMP CONDENSER DATA	FLUID (PROPYLENE GLYCOL-WATER)				30%
	FLUID FLOW (GPM)				180
	PUMP HEAD (EXTERNAL) FT H_2O				15.5
	PUMP POWER (MAX. H_P)				3.0
	PUMP VOLTAGE				480/3ø
	HEAT EXCHANGER CAPACITY BTU/HR				1,401,000
	PIPING ONLY; NOT INCLUSIVE OF COOLER OR STRAINER PRESSURE DROP				
AHU ELECTRIC DATA	UNIT VOLTAGE / PHASE / HERTZ				480/3/60
	MAX FULL LOAD AMPERES				185
	UNIT MINIMUM CIRCUIT AMPACITY (AMPS)				202
	UNIT MAX OVER CURRENT PROTECTION (AMPS)				250
EVAP DATA	TOTAL CAPACITY BTU/HR				1,121,200
	SENSIBLE COOLING CAPACITY BTU/HR				598,600
	LATENT CAPACITY (lbs/hr)				473.9
REHEAT COIL	COIL TYPE				GLYCOL MIX
	CONTROL				FULL MODULATION
	CAPACITY (BTU/hr)				1,401,000
FLUID COOLER	REQUIRED HEAT OF REJECTION (BTU/hr)				1,401,000
	TYPE				GLYCOL MIX
	CONTROL				FULL MODULATION
	NO. OF FANS / MOTORS				6.0
	MOTOR VOLTAGE				460 / 3ø
	MCA				28
	MAXIMUM OVERCURRENT PROTECTION				35
	OPERATING WEIGHT				3600 lbs
AHU / COOLER	DECTRON (YEZEK)		LD-362		NG-V-32
	SERESCO		EQUAL		NG-V-32
	POOL PAK		EQUAL		EQUAL

PUMP SCHEDULE

PUMP NO.		HWP-1	HWP-2	HWP-3	GP-1
SERVICE		HC-1	HC-2	HC-3	GLYCOL FILL
LOCATION		BY HC-1	BY HC-2	BY HC-3	BY ET-1
PUMP SIZE (MAX)		---	---	6"	
DISCHARGE SIZE (MAX)		1.25"	1.25"	2"	.75"
INLET SIZE (MAX)		1.25"	1.25"	2"	.75"
FLOW RATE (G.P.M.)		14.3	8.2	84.1	1.7
FLUID		WATER	WATER	WATER	30% PRPYLENE GLYCOL
HEAD (FEET)		28	20	27.0	92
MOTOR DATA	MAX HORSEPOWER	3/4 HP	1/6 HP	1.5 HP	.5 HP
	R.P.M.	3450	4600	1750	7500
	VOLTAGE / PHASE	120V/1ø	120V/1ø	120V/1ø	120V/1ø
TYPE		INLINE	INLINE	INLINE	END SUCTION
ACCESSORIES SUCTION DIFFUSER = SD					CORD & PLUG
MANUFACTURERS MODEL NO.	ARMSTRONG	ASTRO 286	ASTRO 280	1060 SERIES	LITTLE GIANT UPSP
	BELL & GOSSET	PL55	NRF	E-60	
	GRUNDFOS	UPS 53-55/51	UP 43-75F	EQUAL	LIBERTY 331
	TACO	133	0011	1634	

HEATING COIL SCHEDULE

UNIT / AREA SERVED		HC-1	HC-2	HC-3
FLUID TYPE		WATER	WATER	WATER
REQUIRED CAPACITY BTU/HR		136,000	80,000	817,300
ENT. WATER TEMP.° F		190	190	190
AIR FLOW CFM		2660	2300	34,240
MAX. AIR PRESS. DROP (IN WATER)		.25"	.25"	.25"
ENTERING AIR TEMP° F		67	67	67
WATER FLOW (GPM)		14.3	8.2	84.1
MAX. WATER PRESSURE DROP (FT OF WATER)		13.0	9.0	13.0
MAX. SIZE THICKNESS IN INCHES (WIDTH X HEIGHT X THICKNESS)		27 X 22.5 X 5.5	24 X 18 X 5	78 X 64 X 7
MAX. ROWS / FINS PER INCH		2/8.5	1/14	1.0/9
CONTROL VALVE	SIZE	1"	3/4"	2"
	MINIMUM Q/MAX. PRESS DROP	7.4/8.5 FT	4.7/7 FT	46/8 FT
BASIS OF DESIGN	COIL MASTER			
ACCESSORIES	COATING FOR CHLOROMINE CONCENTRATION	ELECTRO-FIN	ELECTRO-FIN	ELECTRO-FIN

EXPANSION TANK SCHEDULE

TANK NO.		ET-1
LOCATION		2ND FLOOR
SERVING		AHU-1 COOLER
SIZE / TYPE		14"ø x27"
INITIAL PRESS. (PSIA)		29.7
FINAL PRESS (PSIA)		59.7
SYSTEM VOLUME GALLONS		424
ACCEPT VOL. GAL. REQUIRED		5
TOTAL VOL. GAL.		11
ACTUAL VOL. GAL.		11
MANUF. NUMBERS	AMTROL	EQUAL
	WESSELS	EQUAL
	BELL & GOSSETT	EQUAL
	TACO	CBX-42

EXHAUST FAN SCHEDULE

UNIT NO.		EF-1	EF-2	PURGE FAN
LOCATION		ROOF ABOVE LAP POOL	ROOF ABOVE LAZY RIVER	BY WHIRLPOOL
AREA SERVED		THERAPY LAP POOL END	LAZY RIVER END	WHOLE ROOM
FLOW REQ. CFM		6100	970	7500
STATIC PRESS. (IN$_2$ H O)		.75"	.50"	.3"
TYPE		ROOF UP BLAST	ROOF UP BLAST	WALL CENTRIFUGAL
NOMINAL WHEEL SIZE		24"	12"	24"
RPM (NOMINAL)		766	1300	870
DRIVE		BELT	DIRECT	BELT
MAX. HORSEPOWER REQ.		3.0	.25	2.0
VOLTAGE		480V/3ø	120V/1ø	208/1ø
ACCESSORIES C = ROOF CURB GD = GRAVITY DAMPER MD = MOTORIZED DAMPER DS = DISCONNECT SWITCH SC = SPEED CONTROL		C GD DS	C GD DS SC	SEE 2/H100 DS
MANUF.	LOREN COOK	ACRUB	ACRU	245 ACWB
	GREENHECK	CUBE	CUE	240 CUBE

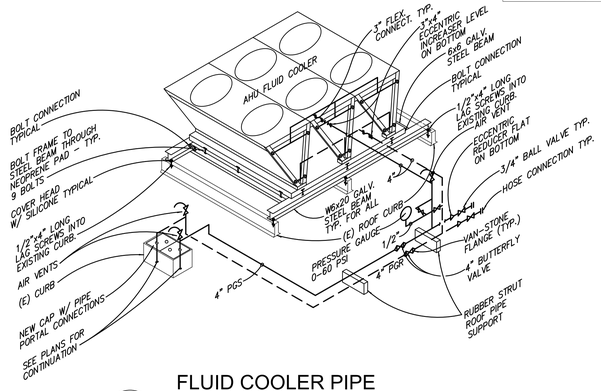
* FIELD VERIFY BEFORE ORDERING. MATCH EXISTING VOLTAGE

GENERAL NOTES CONCERNING ALL EQUPMENT

1. EQUIPMENT & DEVICES SUBMITTED FOR CONSTRUCTION SHALL BE THAT SPECIFIED & SCHEDULED OR SHALL BE APPROVED BY THE ENGINEER PRIOR TO SUBMITTING YOUR BID. CONTRACTOR SHALL USE DRAWINGS, SPECIFICATIONS, AND SCHEDULES TO DEVELOP BID PRICES AND EQUIPMENT SUBMITTALS

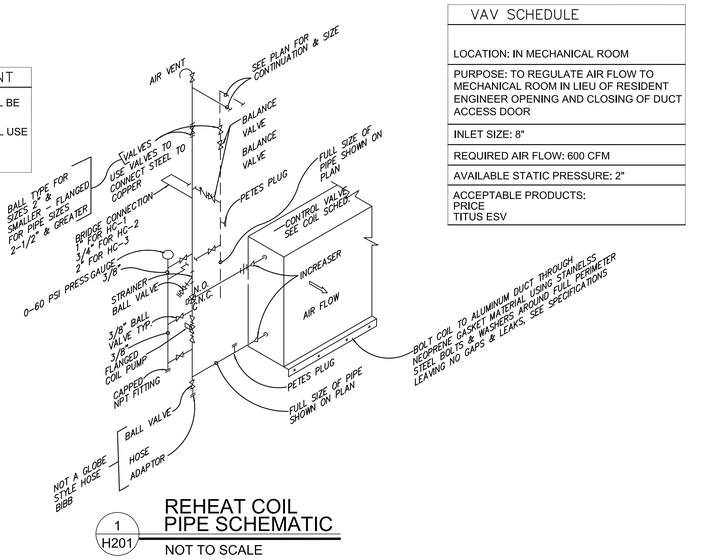
VAV SCHEDULE

LOCATION: IN MECHANICAL ROOM
PURPOSE: TO REGULATE AIR FLOW TO MECHANICAL ROOM IN LIEU OF RESIDENT ENGINEER OPENING AND CLOSING OF DUCT ACCESS DOOR
INLET SIZE: 8"
REQUIRED AIR FLOW: 600 CFM
AVAILABLE STATIC PRESSURE: 2"
ACCEPTABLE PRODUCTS: PRICE TITUS ESV



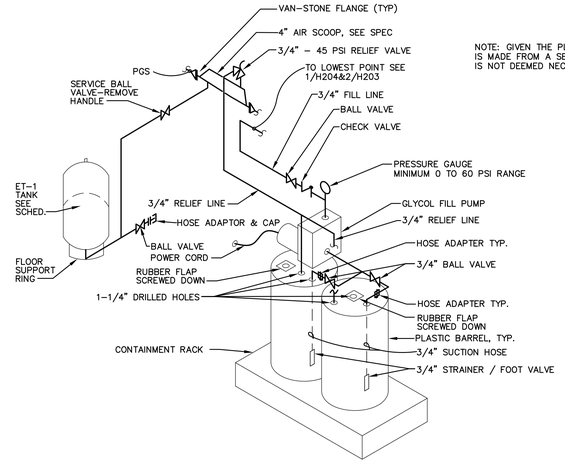
2 H201 FLUID COOLER PIPE AND MOUNTING DIAGRAM

NOT TO SCALE



1 H201 REHEAT COIL PIPE SCHEMATIC

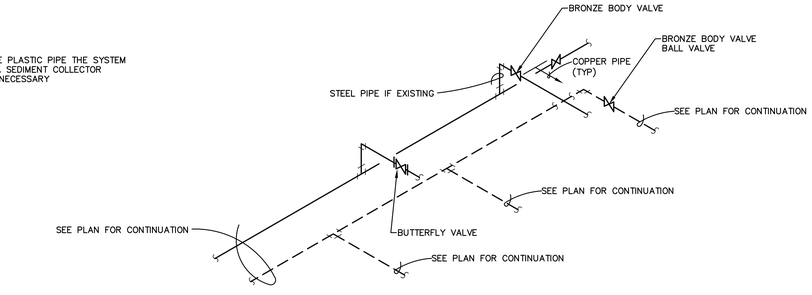
NOT TO SCALE



3 H201 GLYCOL FILL / RELIEF EXPANSION TANK SCHEMATIC

NOT TO SCALE

NOTE: GIVEN THE PLASTIC PIPE THE SYSTEM IS MADE FROM A SEDIMENT COLLECTOR IS NOT DEEMED NECESSARY



4 H201 MAIN CONNECTION SCHEMATIC

NOT TO SCALE

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HVAC SCHEDULES AND DETAILS

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WLLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

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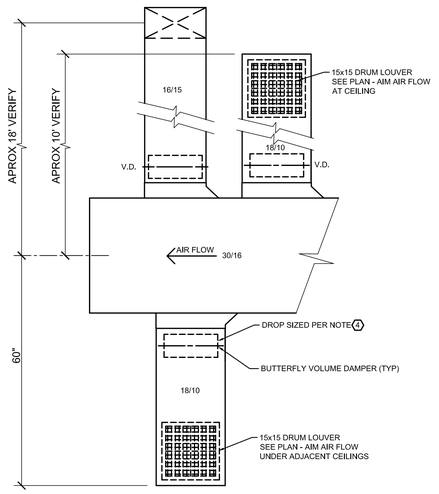
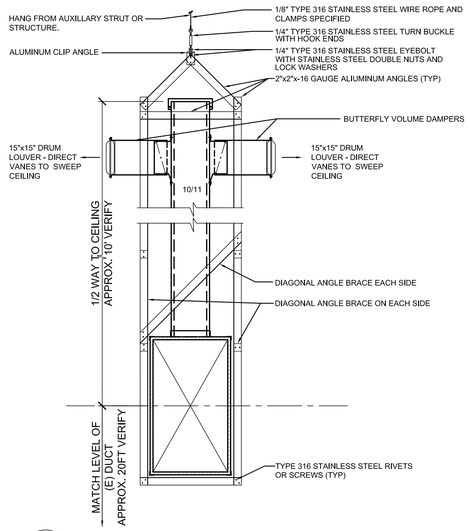
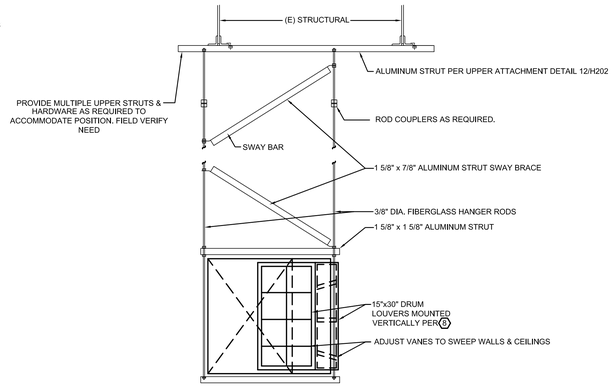


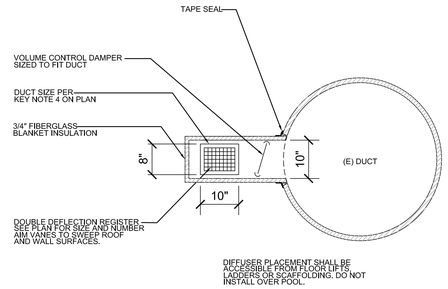
1 H202 **INTERIOR END DETAIL**
3/4" = 1'-0"



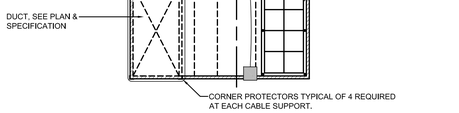
2 H202 **DUCT HANGER/RISER DETAIL**
3/4" = 1'-0"



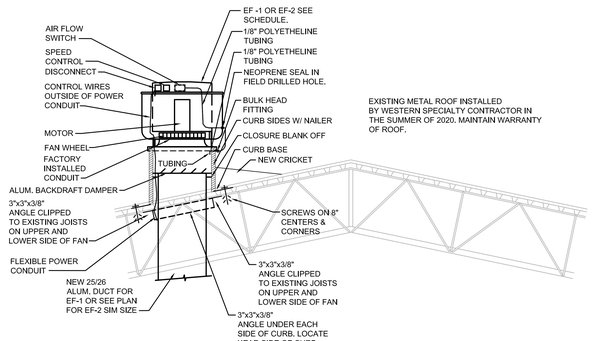
3 H202 **STIFFENED DUCT RISER / HANGER DETAIL**
3/4" = 1'-0"



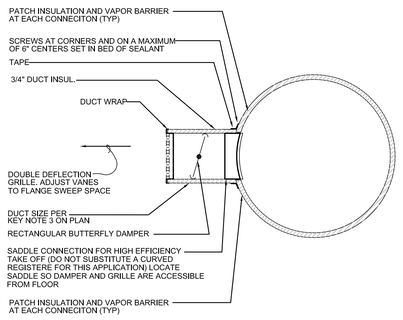
4 H202 **CEILING SPACE ROOF SWEEP GRILLES**
3/4" = 1'-0"



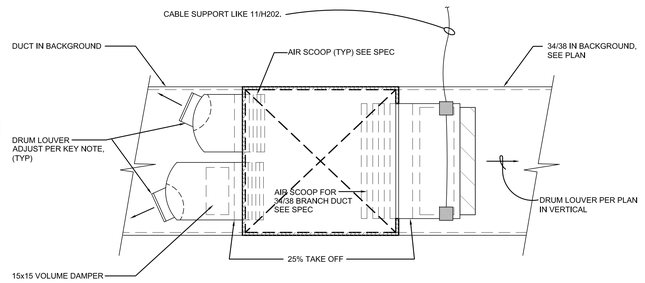
5 H202 **WALL SWEEP**
3/4" = 1'-0"



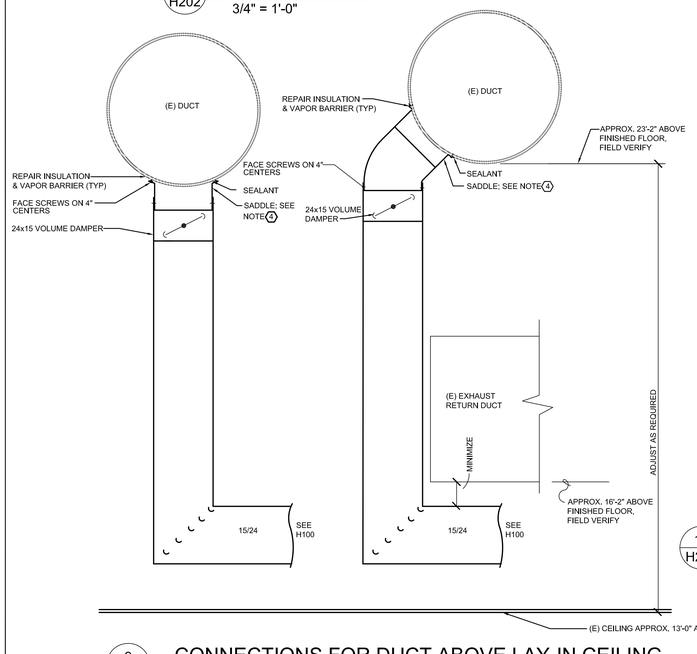
6 H202 **EXHAUST FAN DETAIL**
3/8" = 1'-0"



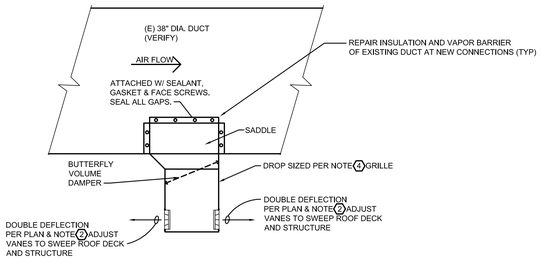
7 H202 **CEILING SPACE GRILLE**
3/4" = 1'-0"



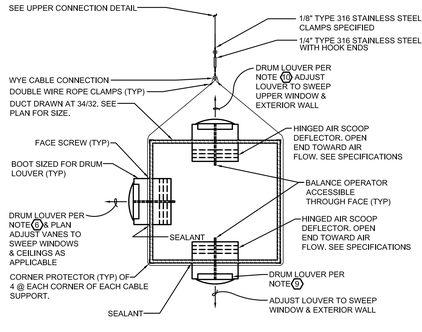
8 H202 **MAIN DUCT @ COLUMN M/6.8**
3/4" = 1'-0"



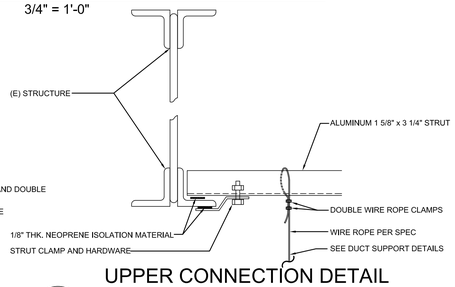
9 H202 **CONNECTIONS FOR DUCT ABOVE LAY-IN CEILING**
3/4" = 1'-0"



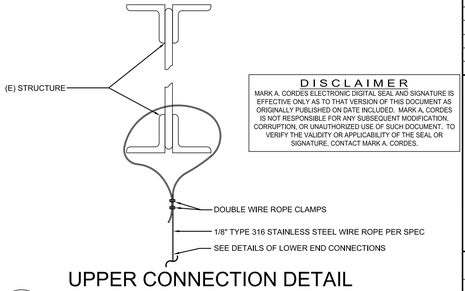
10 H202 **SWEEP ROOF DECK AND STRUCTURE GRILLES**
3/4" = 1'-0"



11 H202 **LEISURE POOL DUCT GRILLES & SUPPORTS**
3/4" = 1'-0"



12 H202 **UPPER CONNECTION DETAIL FOR AUXILLIARY STRUT SUPPORT**
3" = 1'-0"



13 H202 **UPPER CONNECTION DETAIL FOR EXISTING STRUCTURE**
3" = 1'-0"

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AIR DUCT DETAILS

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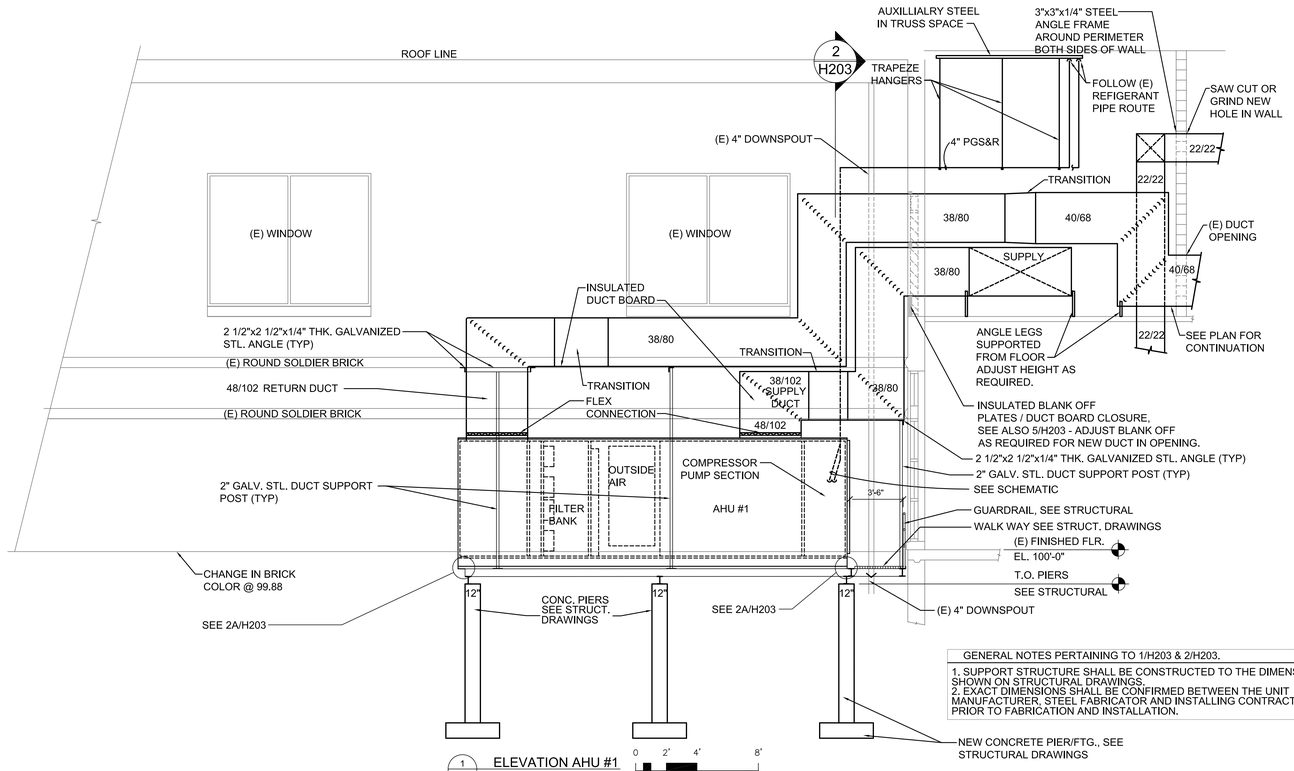
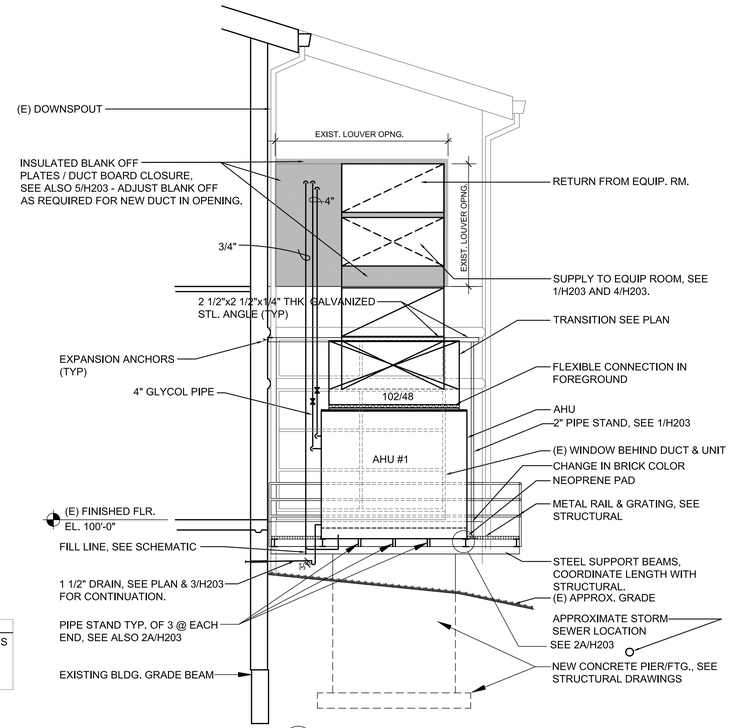


1 H203 ELEVATION AHU #1
1/4" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

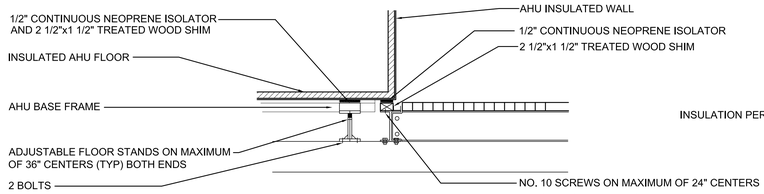
GENERAL NOTES PERTAINING TO 1/H203 & 2/H203.

1. SUPPORT STRUCTURE SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON STRUCTURAL DRAWINGS.
2. EXACT DIMENSIONS SHALL BE CONFIRMED BETWEEN THE UNIT MANUFACTURER, STEEL FABRICATOR AND INSTALLING CONTRACTOR PRIOR TO FABRICATION AND INSTALLATION.



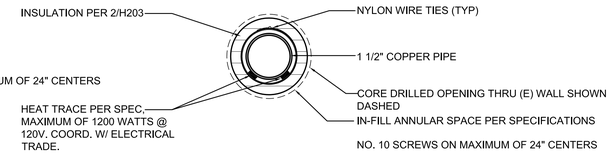
2 H203 SECTION AHU #1
1/4" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

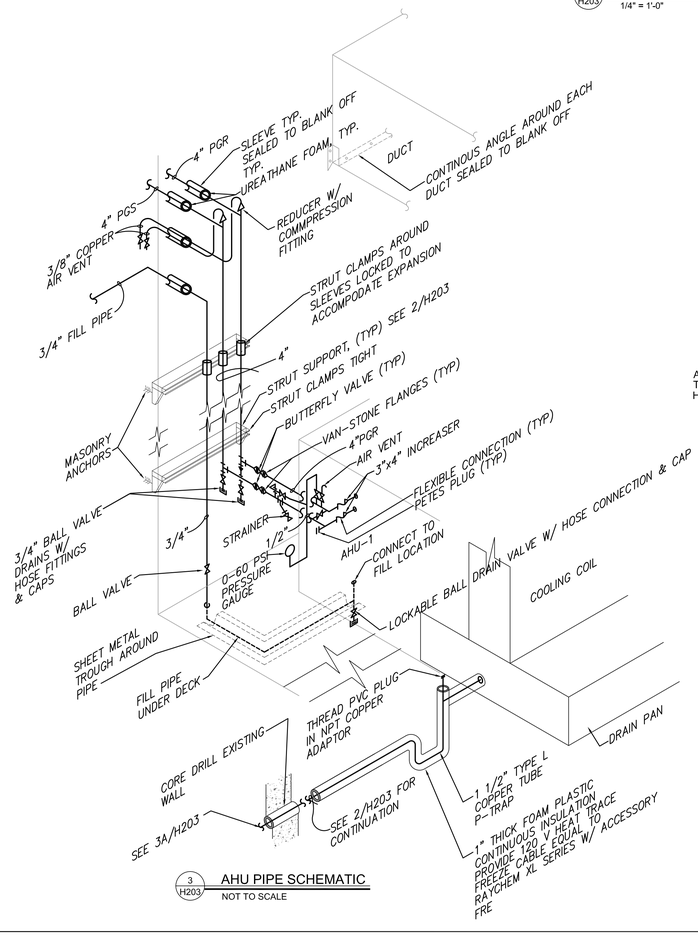


2A H203 AHU MOUNTING DETAILS
SCALE: 1" =1'-0"

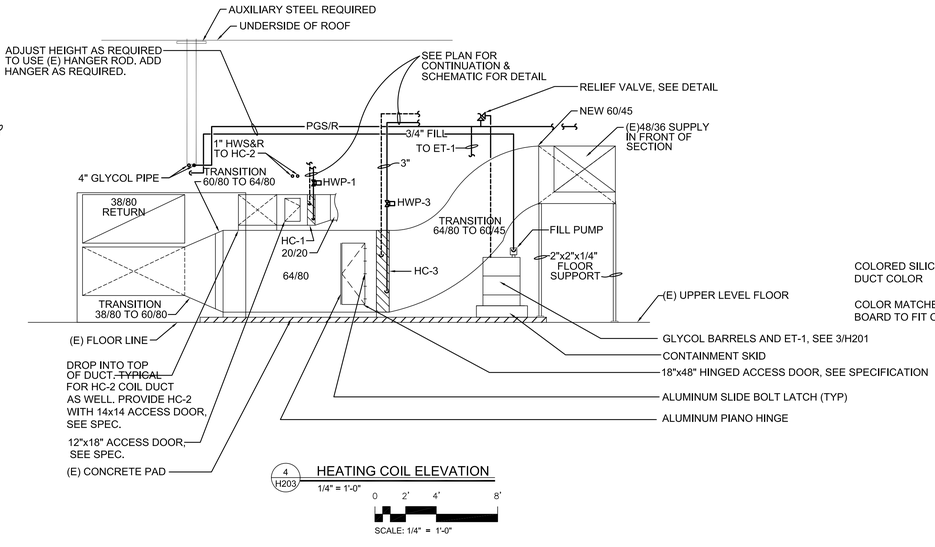
0 3" 6" 1' 2'
SCALE: 1" = 1'-0"



3A H203 CONDENSATE PIPE
HALF SIZE

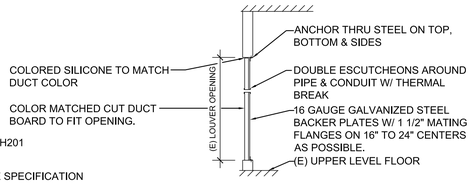


3 H203 AHU PIPE SCHEMATIC
NOT TO SCALE



4 H203 HEATING COIL ELEVATION
1/4" = 1'-0"

0 2' 4' 8'
SCALE: 1/4" = 1'-0"



5 H203 LOUVER CLOSURE DETAIL
1/4" = 1'-0"

SIMILAR FOR LOUVER BLANK OFF PER 1/H10

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

DISCLAIMER

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AHU AND COIL ELEVATIONS AND DETAILS

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WLLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

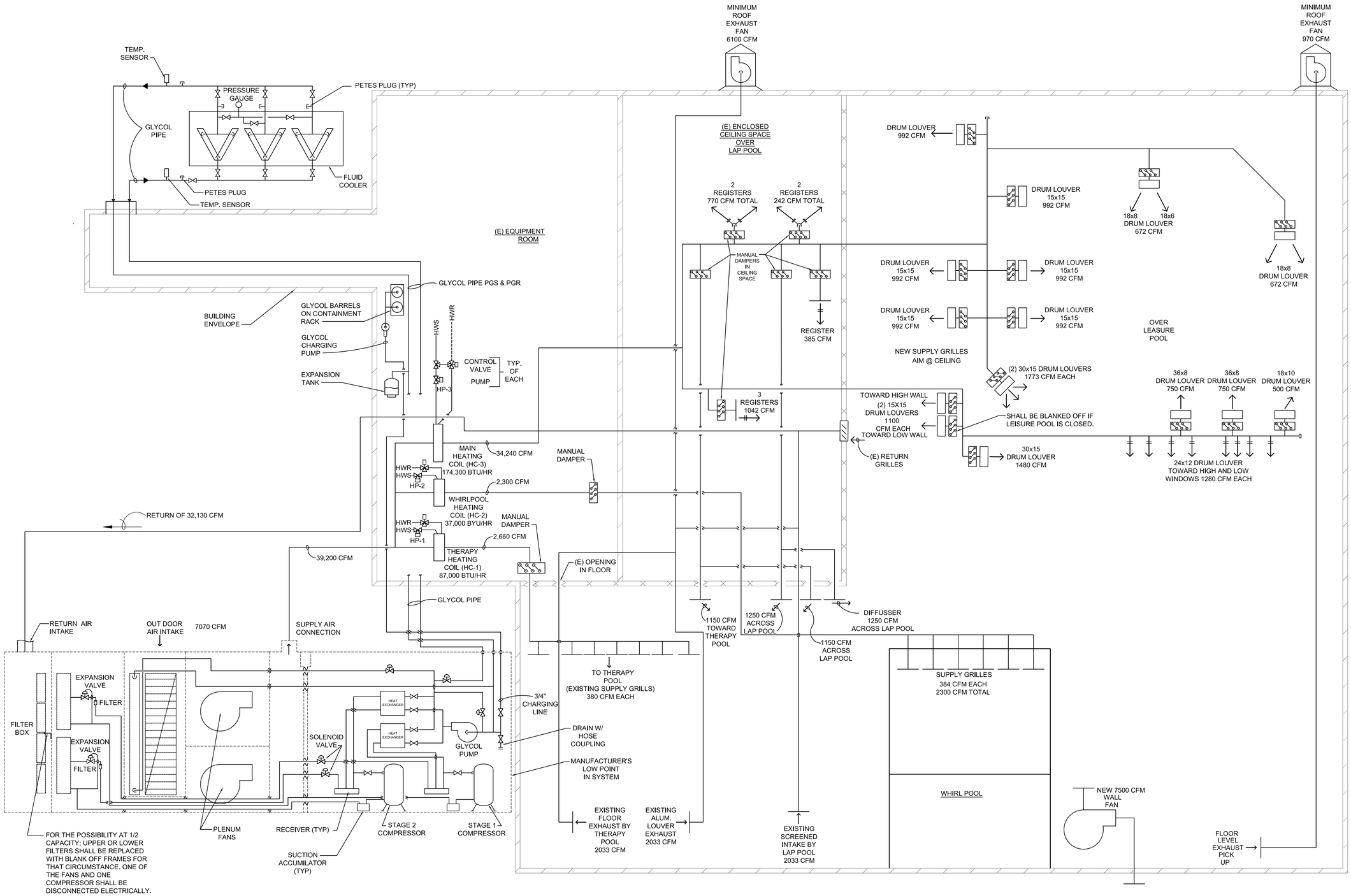
NO.	ISSUE	DATE
1	100% REVIEW	12.15.20
2	BID DOCUMENTS	12.15.20

MARK A. CORDES
062-039301
LICENSED PROFESSIONAL ENGINEER
OF ILLINOIS

EXPIRES 11.30.21 "H" SHEETS ONLY

2-2-21

DATE	12.15.20
PROJECT NO.	2015904.19
DRAWN BY	DAC
CHECKED	MAC
APPROVED	MAC
SHEET	H203
	6 OF 7



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HVAC SYSTEM DRAWING

NATATORIUM HVAC REPLACEMENT
RIVERPLEX RECREATION AND WLLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	100% REVIEW	12.15.20
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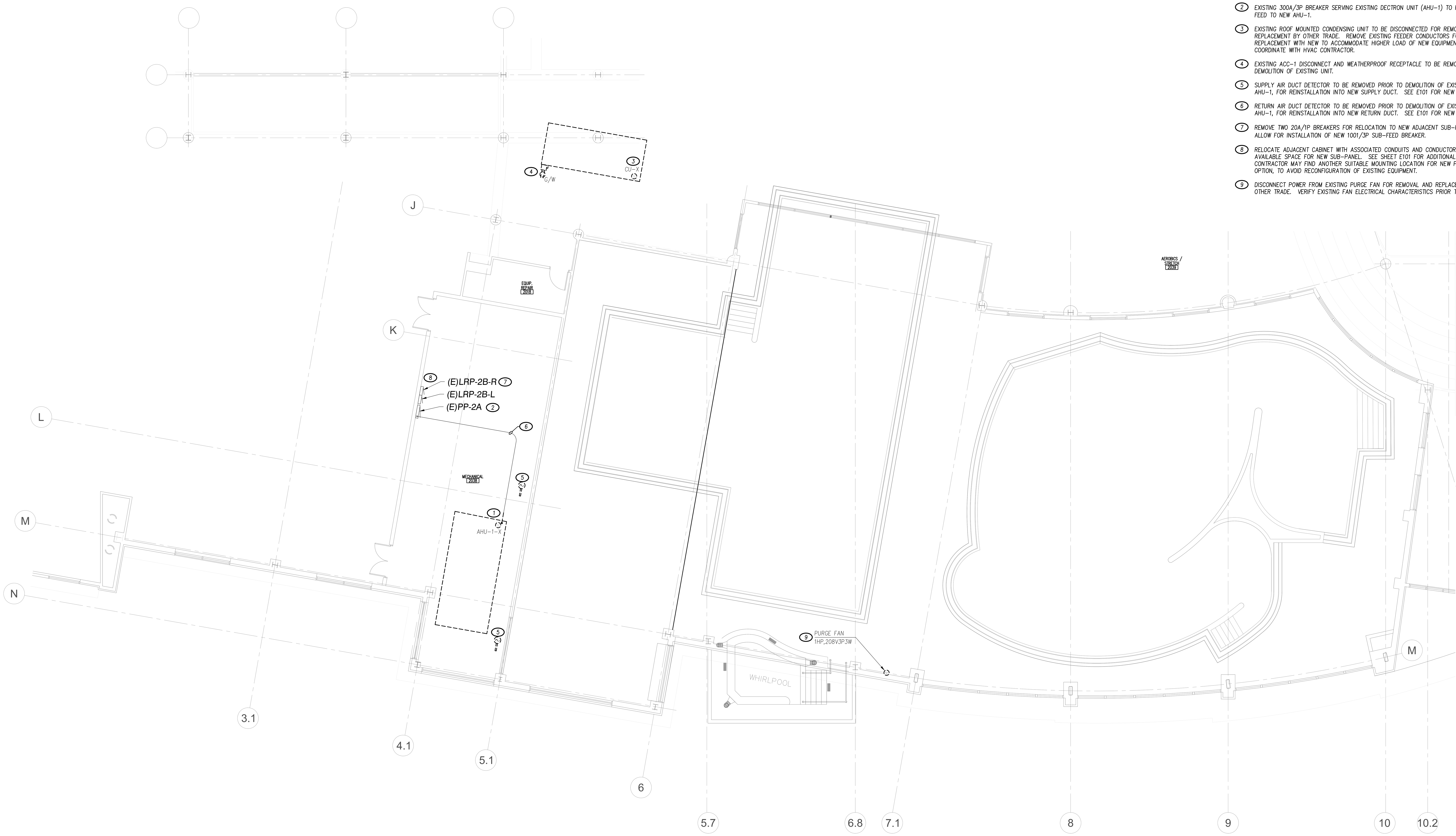
EXPIRES 11.30.21 "H" SHEETS ONLY

2-2-21

DATE	12.15.20
PROJECT NO.	2015904.19
DRAWN BY	DAC
CHECKED	MAC
APPROVED	MAC
SHEET	H204
	7 OF 7

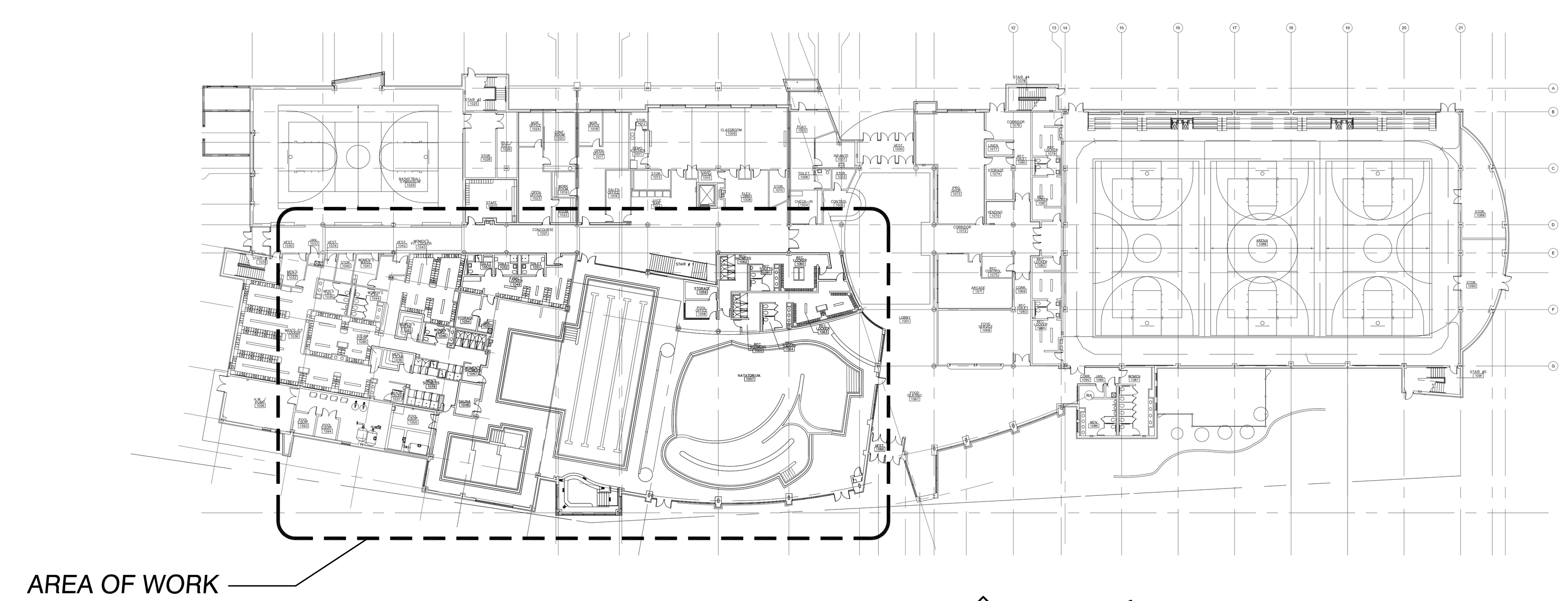
KEYED ELECTRICAL NOTES (THIS SHEET):

1. EXISTING DECTRON UNIT (AHU-1) TO BE DISCONNECTED FOR REMOVAL BY OTHER TRADE. COORDINATE WITH HVAC CONTRACTOR. REMOVE ANY PORTION OF FEEDER THAT WILL NOT BE USED FOR FEED TO NEW AHU. SEE GENERAL DEMOLITION NOTES.
2. EXISTING 300A/3P BREAKER SERVING EXISTING DECTRON UNIT (AHU-1) TO REMAIN FOR FEED TO NEW AHU-1.
3. EXISTING ROOF MOUNTED CONDENSING UNIT TO BE DISCONNECTED FOR REMOVAL AND REPLACEMENT BY OTHER TRADE. REMOVE EXISTING FEEDER CONDUCTORS FOR REPLACEMENT WITH NEW TO ACCOMMODATE HIGHER LOAD OF NEW EQUIPMENT. COORDINATE WITH HVAC CONTRACTOR.
4. EXISTING ACC-1 DISCONNECT AND WEATHERPROOF RECEPTACLE TO BE REMOVED FOR DEMOLITION OF EXISTING UNIT.
5. SUPPLY AIR DUCT DETECTOR TO BE REMOVED PRIOR TO DEMOLITION OF EXISTING DUCT AND AHU-1, FOR REINSTALLATION INTO NEW SUPPLY DUCT. SEE E101 FOR NEW LOCATION.
6. RETURN AIR DUCT DETECTOR TO BE REMOVED PRIOR TO DEMOLITION OF EXISTING DUCT AND AHU-1, FOR REINSTALLATION INTO NEW RETURN DUCT. SEE E101 FOR NEW LOCATION.
7. REMOVE TWO 20A/1P BREAKERS FOR RELOCATION TO NEW ADJACENT SUB-PANEL, TO ALLOW FOR INSTALLATION OF NEW 1001/3P SUB-FEED BREAKER.
8. RELOCATE ADJACENT CABINET WITH ASSOCIATED CONDUITS AND CONDUCTORS TO CREATE AVAILABLE SPACE FOR NEW SUB-PANEL. SEE SHEET E101 FOR ADDITIONAL INFORMATION. CONTRACTOR MAY FIND ANOTHER SUITABLE MOUNTING LOCATION FOR NEW PANEL, AT THEIR OPTION, TO AVOID RECONFIGURATION OF EXISTING EQUIPMENT.
9. DISCONNECT POWER FROM EXISTING PURGE FAN FOR REMOVAL AND REPLACEMENT BY OTHER TRADE. VERIFY EXISTING FAN ELECTRICAL CHARACTERISTICS PRIOR TO DISCONNECT.



1 2ND FLOOR - ELECTRICAL DEMOLITION
SCALE: 1/8" = 1'-0"
0 4' 8' 16'

NORTH
TRUE NORTH



2 KEY PLAN
SCALE: 1" = 50'-0"
0 4' 8' 16'

NORTH
TRUE NORTH

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2ND FLOOR ELECTRICAL DEMOLITION PLAN

HVAC CHILLER REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	BID DOCUMENTS	12.15.20

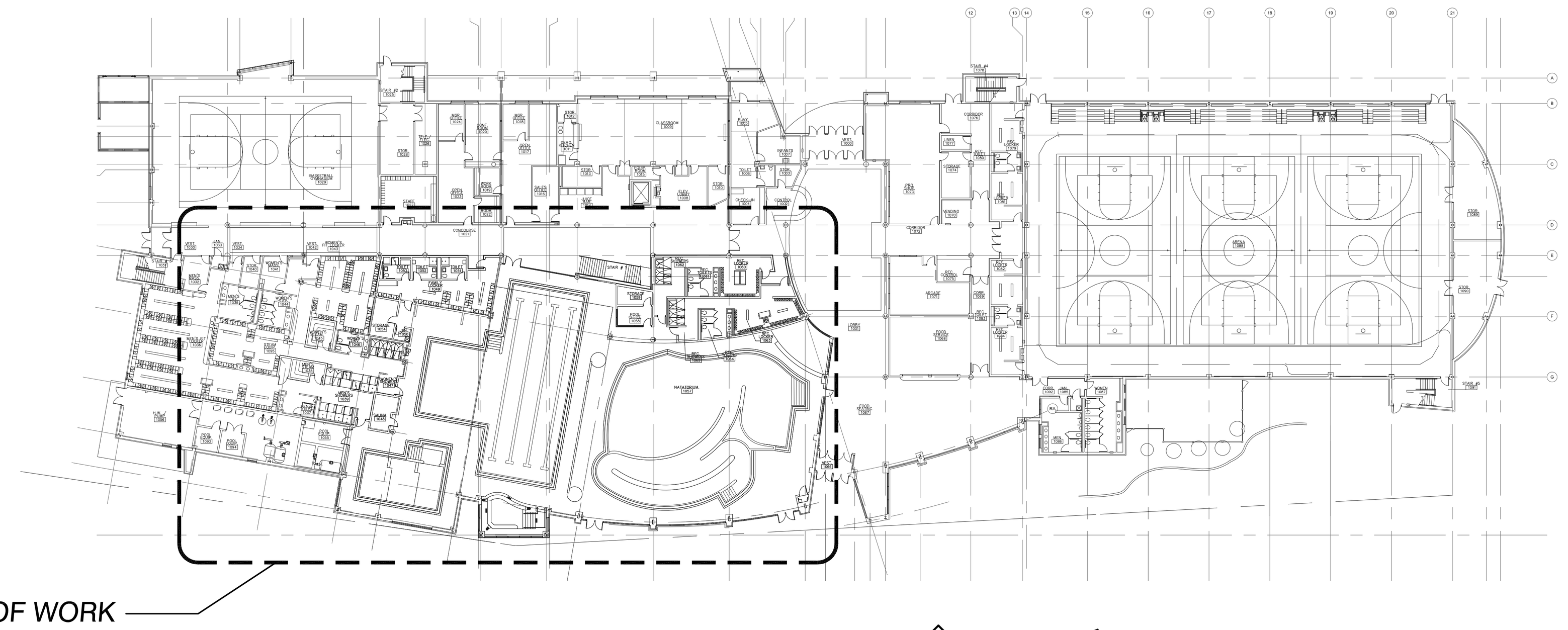
DATE: 02/02/2021

DATE 12.15.20	PROJECT NO. 2015904.19
DRAWN BY TDC	SHEET
CHECKED TDC	ED101
APPROVED BRK	2 OF 4

KEYED ELECTRICAL NOTES (THIS SHEET):

1. CONNECT TO EXTENDED CIRCUIT FROM PREVIOUSLY REMOVED DECTRON UNIT. SEE SHEET E101 FOR ADDITIONAL INFORMATION.
2. PROVIDE WEATHERPROOF, GFCI, 20-AMP, DUPLEX RECEPTACLE FOR HEAT TRACE POWER CONNECTION. PROVIDE DEDICATED 20-AMP CIRCUIT.
3. PROVIDE ADDRESSABLE FIRE ALARM CONTROL RELAY FOR SHUTDOWN OF AHU UPON DUCT SMOKE DETECTOR ACTIVATION. COORDINATE ALL WORK WITH FIRE ALARM SYSTEMS CONTRACTOR (INTERFACE).

1 1ST FLOOR - REVISED ELECTRICAL
SCALE: 1/8" = 1'-0"
0 4' 8' 16'
NORTH
TRUE NORTH



2 KEY PLAN
SCALE: 1" = 50'-0"
0 4' 8' 16'
NORTH
TRUE NORTH

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REVISED 1ST FLOOR ELECTRICAL PLAN

HVAC CHILLER REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

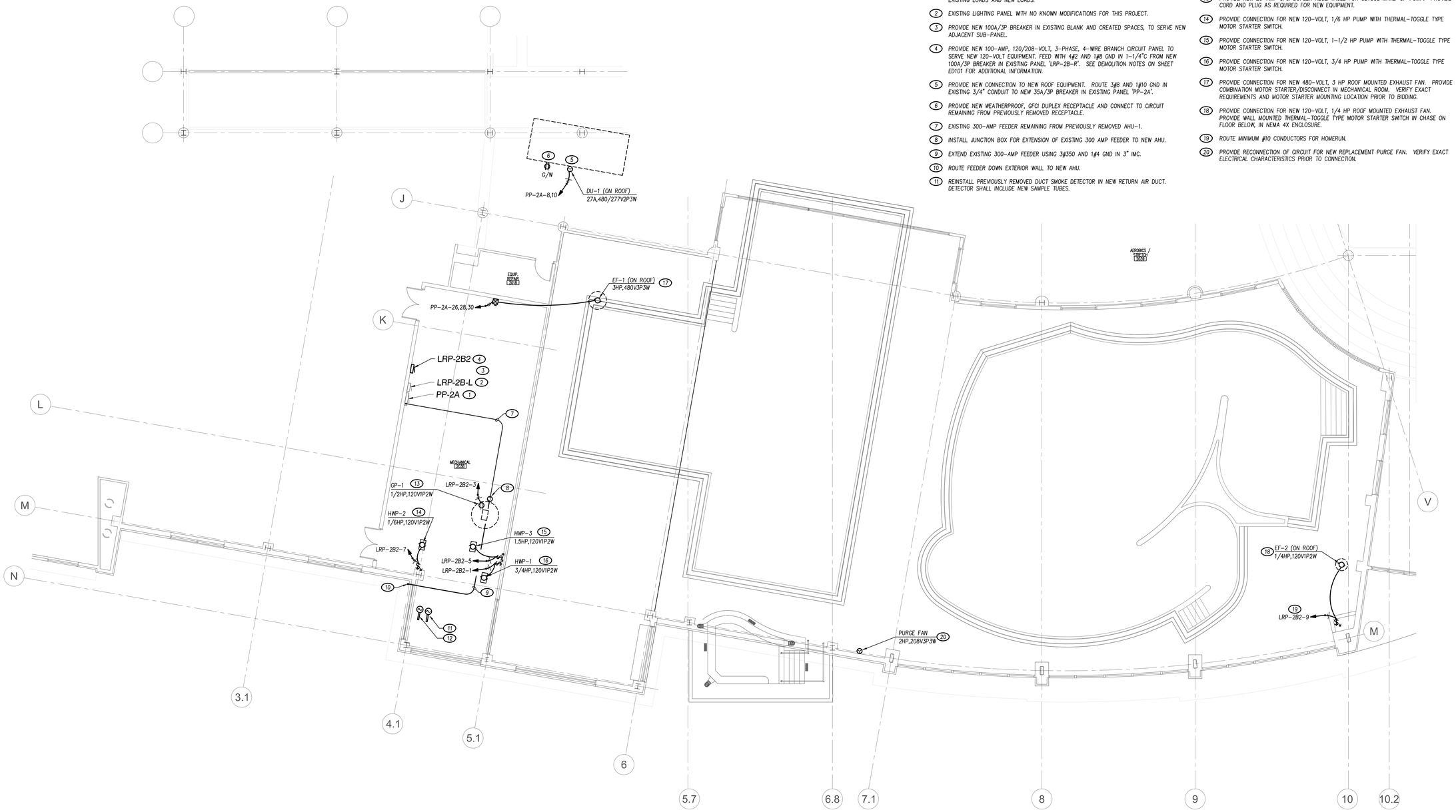
NO.	ISSUE	DATE
1	BID DOCUMENTS	12.15.20

DATE: 02/02/2021

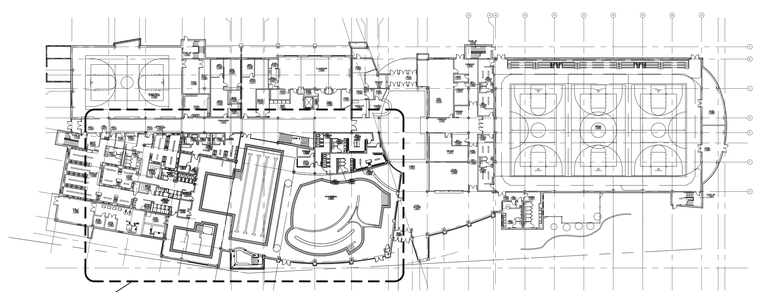
DATE 12.15.20	PROJECT NO. 2015904.19
DRAWN BY TDC	SHEET
CHECKED TDC	E100
APPROVED BRK	2 OF 4

KEYED ELECTRICAL NOTES (THIS SHEET):

1. PROVIDE NEW 15A/3P BREAKER IN EXISTING PANEL FOR NEW ROOF EXHAUST FAN FEEDER AND REPLACE EXISTING 25A/3P FOR ACC-1 WITH NEW 35A/3P FOR NEW FLUID COOLER FEED. PROVIDE COMPLETE, NEW, MACHINE PRINTED PANEL CIRCUIT DIRECTORY INDICATING EXISTING LOADS AND NEW LOADS.
2. EXISTING LIGHTING PANEL WITH NO KNOWN MODIFICATIONS FOR THIS PROJECT.
3. PROVIDE NEW 100A/3P BREAKER IN EXISTING BLANK AND CREATED SPACES, TO SERVE NEW ADJACENT SUB-PANEL.
4. PROVIDE NEW 100-AMP, 120/208-VOLT, 3-PHASE, 4-WIRE BRANCH CIRCUIT PANEL TO SERVE NEW 120-VOLT EQUIPMENT. FEED WITH 4#2 AND 1#8 GND IN 1-1/4"C FROM NEW 100A/3P BREAKER IN EXISTING PANEL 'LRP-2B-R'. SEE DEMOLITION NOTES ON SHEET ED101 FOR ADDITIONAL INFORMATION.
5. PROVIDE NEW CONNECTION TO NEW ROOF EQUIPMENT. ROUTE 3#8 AND 1#10 GND IN EXISTING 3/4" CONDUIT TO NEW 35A/3P BREAKER IN EXISTING PANEL 'PP-2A'.
6. PROVIDE NEW WEATHERPROOF, GFCI DUPLEX RECEPTACLE AND CONNECT TO CIRCUIT REMAINING FROM PREVIOUSLY REMOVED RECEPTACLE.
7. EXISTING 300-AMP FEEDER REMAINING FROM PREVIOUSLY REMOVED AHU-1.
8. INSTALL JUNCTION BOX FOR EXTENSION OF EXISTING 300 AMP FEEDER TO NEW AHU.
9. EXTEND EXISTING 300-AMP FEEDER USING 3#350 AND 1#4 GND IN 3" IMC.
10. ROUTE FEEDER DOWN EXTERIOR WALL TO NEW AHU.
11. REINSTALL PREVIOUSLY REMOVED DUCT SMOKE DETECTOR IN NEW RETURN AIR DUCT. DETECTOR SHALL INCLUDE NEW SAMPLE TUBES.
12. REINSTALL PREVIOUSLY REMOVED DUCT SMOKE DETECTOR IN NEW SUPPLY AIR DUCT. DETECTOR SHALL INCLUDE NEW SAMPLE TUBES.
13. PROVIDE NEW 20-AMP GFCI DUPLEX RECEPTACLE FOR GLYCOL MAKE-UP PUMP. PROVIDE CORD AND PLUG AS REQUIRED FOR NEW EQUIPMENT.
14. PROVIDE CONNECTION FOR NEW 120-VOLT, 1/6 HP PUMP WITH THERMAL-TOGGLE TYPE MOTOR STARTER SWITCH.
15. PROVIDE CONNECTION FOR NEW 120-VOLT, 1-1/2 HP PUMP WITH THERMAL-TOGGLE TYPE MOTOR STARTER SWITCH.
16. PROVIDE CONNECTION FOR NEW 120-VOLT, 3/4 HP PUMP WITH THERMAL-TOGGLE TYPE MOTOR STARTER SWITCH.
17. PROVIDE CONNECTION FOR NEW 480-VOLT, 3 HP ROOF MOUNTED EXHAUST FAN. PROVIDE COMBINATION MOTOR STARTER/DISCONNECT IN MECHANICAL ROOM. VERIFY EXACT REQUIREMENTS AND MOTOR STARTER MOUNTING LOCATION PRIOR TO BIDDING.
18. PROVIDE CONNECTION FOR NEW 120-VOLT, 1/4 HP ROOF MOUNTED EXHAUST FAN. PROVIDE WALL MOUNTED THERMAL-TOGGLE TYPE MOTOR STARTER SWITCH IN CHASE ON FLOOR BELOW, IN NEMA 4X ENCLOSURE.
19. ROUTE MINIMUM #10 CONDUCTORS FOR HOMERUN.
20. PROVIDE RECONNECTION OF CIRCUIT FOR NEW REPLACEMENT PURGE FAN. VERIFY EXACT ELECTRICAL CHARACTERISTICS PRIOR TO CONNECTION.



1 **2ND FLOOR - REVISED ELECTRICAL**
SCALE: 1/8" = 1'-0"
0 4' 8' 16'
NORTH
TRUE NORTH



2 **KEY PLAN**
SCALE: 1" = 50'-0"
0 4' 8' 16'
NORTH
TRUE NORTH

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2ND FLOOR REVISED ELECTRICAL PLAN

HVAC CHILLER REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	BID DOCUMENTS	12.15.20

BRIAN R. KITH 062-050306 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS
DATE: 02/02/2021

DATE: 12.15.20	PROJECT NO. 2015904.19
DRAWN BY: TDC	SHEET E101
CHECKED: TDC	
APPROVED: BRK	3 OF 4

EXISTING PANELS TO REMAIN - SCHEDULES (FOR REFERENCE ONLY):

(E)PP-2A

PANEL: (E)PP-2A | ROOM: MECH 2038 | VOLTS: 480Y/277V 3P 4W | AIC: 22,000
MOUNTING: SURFACE | BUS AMPS: 400 | MAIN: MLO
FED FROM: (E)MSB-1 | NEUTRAL: 100% | LUGS: STANDARD
NOTE: CUTLER-HAMMER POW-R-LINE C PRL3a

CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
1	70/3	0	AHU-5	a	2	40/3	0	AHU-4
3	|			b	4	|		
5	|			c	6	|		
7	30/3	0	AHU-2	a	8	25/3	0	ACC-1
9	|			b	10	|		
11	|			c	12	|		
13	25/3	0	RAF-5	a	14	20/3	0	ACC-2
15	|			b	16	|		
17	|			c	18	|		
19	20/3	0	AHU-3	a	20	20/3	0	RAF-4
21	|			b	22	|		
23	|			c	24	|		
25	20/3	0	RAF-3	a	26	-/1	0	SPACE
27	|			b	28	-/1	0	SPACE
29	|			c	30	-/1	0	SPACE
31	300/3	0	AHU-1 (DECTRON)	a	32	-/3	0	SPACE ONLY-NOT AVAILABLE
33	|			b	34	|		
35	|			c	36	|		

	CONN. KVA	CALC. KVA			CONN. KVA	CALC. KVA	
LIGHTING	0	0	(125%)	CONTINUOUS	0	0	(125%)
LARGEST MOTOR	0	0	(125%)	HEATING	0	0	(100%)
OTHER MOTORS	0	0	(100%)	NONCONTINUOUS	0	0	(100%)
RECEPTACLES	0	0	(50%>10)	KITCHEN EQUIP	0	0	(N/A)
				NONCOIN/DIVERSE	0	0	(N/A)
				TOTAL KVA	0	0	
				BALANCED THREE PHASE AMPS		0	

PHASE BALANCE PERCENT: PHASE A 0.00% PHASE B 0.00% PHASE C 0.00%

(E)LRP-2B-R

PANEL: (E)LRP-2B-R | ROOM: MECHANICAL 2038 | VOLTS: 208Y/120V 3P 4W | AIC: 10,000
MOUNTING: SURFACE | BUS AMPS: 225 | MAIN: MLO
FED FROM: UTILITY | NEUTRAL: 100% | LUGS: STANDARD
NOTE: CUTTLER-HAMMER POW-R-LINE C PRL1a

CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION
43	20/1	0	RECEPTS - RM 2035 W. WALL	a	44	20/1	0	RECEPTS - RM 2035
45	20/1	0	RECEPTS - S.WALL RM 2037	b	46	20/1	0	RECEPTS - RM 2035 S.WALL
47	20/1	0	RECEPTS - FLOOR RM 2037	c	48	20/1	0	RECEPTS - FLOOR RM 2037
49	20/1	0	RECEPTS - FLOOR RM 2037	a	50	20/1	0	RECEPTS - FLOOR RM 2037
51	20/1	0	RECEPTS - FLOOR RM 2037	b	52	20/1	0	RECEPTS - FLOOR RM 2037
53	20/1	0	RECEPTS - FLOOR RM 2035	c	54	20/1	0	RECEPTS - FLOOR RM 2035
55	20/1	0	RECEPTS - FLOOR RM 2035	a	56	20/1	0	RECEPTS - FLOOR RM 2035
57	20/1	0	RECEPTS - FLOOR RM 2035	b	58	20/1	0	RECEPTS - FLOOR RM 2035
59	20/1	0	RECEPTS - FLOOR RM 2037	c	60	20/1	0	TEMP CONTROL BOXES 3,4,5
61	20/1	0	RECEPTS - FLOOR	a	62	20/1	0	FAN
63	20/1	0	RECEPTS - FLOOR	b	64	20/1	0	FAN
65	20/1	0	RECEPTS - FLOOR	c	66	20/1	0	FAN
67	20/1	0	RECEPTS - FLOOR	a	68	20/1	0	FAN
69	20/1	0	RECEPTS - FLOOR	b	70	20/1	0	RECEPT - GFI IN POOL ELEC. RM
71	20/1	0	RECEPTS - FLOOR	c	72	20/1	0	??
73	20/1	0	RECEPTS - FLOOR	a	74	20/1	0	SCOT CARE OUTLET
75	20/1	0	RECEPTS - FLOOR	b	76	20/1	0	SCOT CARE OUTLET
77	20/1	0	RECEPTS - FLOOR	c	78	20/1	0	??
79	20/1	0	RECEPTS - FLOOR	a	80	20/1	0	??
81	20/1	0	RECEPTS - FLOOR	b	82	20/1	0	??
83	20/1	0	RECEPTS - FLOOR	c	84	-/1	0	SPACE

	CONN. KVA	CALC. KVA			CONN. KVA	CALC. KVA	
LIGHTING	0	0	(125%)	CONTINUOUS	0	0	(125%)
LARGEST MOTOR	0	0	(125%)	HEATING	0	0	(100%)
OTHER MOTORS	0	0	(100%)	NONCONTINUOUS	0	0	(100%)
RECEPTACLES	0	0	(50%>10)	KITCHEN EQUIP	0	0	(N/A)
				NONCOIN/DIVERSE	0	0	(N/A)
				TOTAL KVA	0	0	
				BALANCED THREE PHASE AMPS		0	

PHASE BALANCE PERCENT: PHASE A 0.00% PHASE B 0.00% PHASE C 0.00%

EXISTING PANELS - MODIFIED SCHEDULES:

PP-2A

PANEL: PP-2A | ROOM: MECHANICAL 2038 | VOLTS: 480Y/277V 3P 4W | AIC: 22,000
MOUNTING: SURFACE | BUS AMPS: 400 | MAIN: MLO
FED FROM: MSB-1 | NEUTRAL: 100% | LUGS: STANDARD
NOTE: CUTLER-HAMMER POW-R-LINE C PRL3a

	CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
	1	70/3	0	AHU-5	a	2	40/3	0	AHU-4	
	3	|			b	4	|			
	5	|			c	6	|			
	7	30/3	0	AHU-2	a	8	35/2	13	DU-1 (ON ROOF)	ML
	9	|			b	10	|			
	11	|			c	12	20/1	0	SPARE	
	13	25/3	0	RAF-5	a	14	20/3	0	ACC-2	
	15	|			b	16	|			
	17	|			c	18	|			
	19	20/3	0	AHU-3	a	20	20/3	0	RAF-4	
	21	|			b	22	|			
	23	|			c	24	|			
	25	20/3	0	RAF-3	a	26	15/3	3.99	EF-1 (ON ROOF)	ML
	27	|			b	28	|			
	29	|			c	30	|			
ML	31	300/3	154	AHU-1	a	32	-/3	0	SPACE ONLY-NOT AVAILABLE	
	33	|			b	34	|			
	35	|			c	36	|			

	CONN. KVA	CALC. KVA			CONN. KVA	CALC. KVA	
LIGHTING	0	0	(125%)	CONTINUOUS	0	0	(125%)
LARGEST MOTOR	154	38.5	(125%)	HEATING	0	0	(100%)
OTHER MOTORS	3.99	3.99	(100%)	NONCONTINUOUS	0	0	(100%)
RECEPTACLES	0	0	(50%>10)	KITCHEN EQUIP	0	0	(N/A)
				NONCOIN/DIVERSE	0	0	(N/A)
				TOTAL KVA	171	209	
				BALANCED THREE PHASE AMPS		252	

PHASE BALANCE PERCENT: PHASE A 104% PHASE B 104% PHASE C 92.3%

ML = MODIFIED LOAD

LRP-2B-R

PANEL: LRP-2B-R | ROOM: MECHANICAL 2038 | VOLTS: 208Y/120V 3P 4W | AIC: 22,000
MOUNTING: SURFACE | BUS AMPS: 225 | MAIN: MLO
FED FROM: UTILITY | NEUTRAL: 100% | LUGS: STANDARD
NOTE: CUTTLER-HAMMER POW-R-LINE C PRL1a

CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
43	20/1	0	RECEPTS - RM 2035 W. WALL	a	44	20/1	0	RECEPTS - RM 2035	
45	20/1	0	RECEPTS - S.WALL RM 2037	b	46	20/1	0	RECEPTS - RM 2035 S.WALL	
47	20/1	0	RECEPTS - FLOOR RM 2037	c	48	20/1	0	RECEPTS - FLOOR RM 2037	
49	20/1	0	RECEPTS - FLOOR RM 2037	a	50	20/1	0	RECEPTS - FLOOR RM 2037	
51	20/1	0	RECEPTS - FLOOR RM 2037	b	52	20/1	0	RECEPTS - FLOOR RM 2037	
53	20/1	0	RECEPTS - FLOOR RM 2035	c	54	20/1	0	RECEPTS - FLOOR RM 2035	
55	20/1	0	RECEPTS - FLOOR RM 2035	a	56	20/1	0	RECEPTS - FLOOR RM 2035	
57	20/1	0	RECEPTS - FLOOR RM 2035	b	58	20/1	0	RECEPTS - FLOOR RM 2035	
59	20/1	0	RECEPTS - FLOOR RM 2037	c	60	20/1	0	TEMP CONTROL BOXES 3,4,5	
61	20/1	0	RECEPTS - FLOOR	a	62	20/1	0	FAN	
63	20/1	0	RECEPTS - FLOOR	b	64	20/1	0	FAN	
65	20/1	0	RECEPTS - FLOOR	c	66	20/1	0	FAN	
67	20/1	0	RECEPTS - FLOOR	a	68	20/1	0	FAN	
69	20/1	0	RECEPTS - FLOOR	b	70	20/1	0	RECEPT - GFI IN POOL ELEC. RM	
71	20/1	0	RECEPTS - FLOOR	c	72	20/1	0	??	
73	20/1	0	RECEPTS - FLOOR	a	74	20/1	0	SCOT CARE OUTLET	
75	20/1	0	RECEPTS - FLOOR	b	76	20/1	0	SCOT CARE OUTLET	
77	20/1	0	RECEPTS - FLOOR	c	78	20/1	0	??	
79	20/1	0	RECEPTS - FLOOR	a	80	100/3	6.46	PANEL LRP-2B2	ML
81	20/1	0	RECEPTS - FLOOR	b	82	|			
83	20/1	0	RECEPTS - FLOOR	c	84	|			

	CONN. KVA	CALC. KVA			CONN. KVA	CALC. KVA	
LIGHTING	0	0	(125%)	CONTINUOUS	0	0	(125%)
LARGEST MOTOR	0.696	0.87	(125%)	HEATING	5.76	5.76	(100%)
OTHER MOTORS	0	0	(100%)	NONCONTINUOUS	0	0	(100%)
RECEPTACLES	0	0	(50%>10)	KITCHEN EQUIP	0	0	(N/A)
				NONCOIN/DIVERSE	0	0	(N/A)
				TOTAL KVA	6.46	6.63	
				BALANCED THREE PHASE AMPS		18.4	

PHASE BALANCE PERCENT: PHASE A 101% PHASE B 87% PHASE C 112%

ML = MODIFIED LOAD

NEW PANEL SCHEDULE:

LRP-2B2

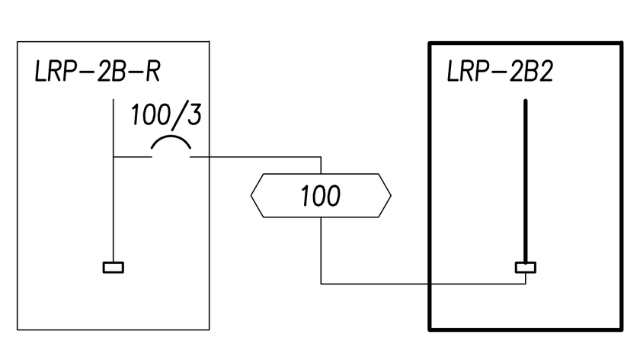
PANEL: LRP-2B2 | ROOM: MECHANICAL 2038 | VOLTS: 208Y/120V 3P 4W | AIC: 10,000
MOUNTING: SURFACE | BUS AMPS: 100 | MAIN: MLO
FED FROM: LRP-2B-R | NEUTRAL: 100% | LUGS: STANDARD
NOTE:

CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION		CKT #	CKT BKR	LOAD KVA	CIRCUIT DESCRIPTION	
1	25/1	1.66	HWP-1	a	2	20/1	0	??	EL (1)
3	20/1	1.18	GP-1	b	4	20/1	0	??	EL
5	40/1	2.4	HWP-3	c	6	20/1	0	SPARE	
7	20/1	0.528	HWP-2	a	8	20/1	0	SPARE	
9	20/1	0.696	EF-2 (ON ROOF)	b	10	20/1	0	SPARE	
11	20/1	0	SPARE	c	12	20/1	0	SPARE	
13	20/1	0	SPARE	a	14	20/1	0	SPARE	
15	20/1	0	SPARE	b	16	20/1	0	SPARE	
17	20/1	0	SPARE	c	18	20/1	0	SPARE	
19	20/1	0	SPARE	a	20	20/1	0	SPARE	
21	20/1	0	SPARE	b	22	20/1	0	SPARE	
23	20/1	0	SPARE	c	24	20/1	0	SPARE	
25	20/1	0	SPARE	a	26	20/1	0	SPARE	
27	20/1	0	SPARE	b	28	20/1	0	SPARE	
29	20/1	0	SPARE	c	30	20/1	0	SPARE	

	CONN. KVA	CALC. KVA			CONN. KVA	CALC. KVA	
LIGHTING	0	0	(125%)	CONTINUOUS	0	0	(125%)
LARGEST MOTOR	0.696	0.87	(125%)	HEATING	5.76	5.76	(100%)
OTHER MOTORS	0	0	(100%)	NONCONTINUOUS	0	0	(100%)
RECEPTACLES	0	0	(50%>10)	KITCHEN EQUIP	0	0	(N/A)
				NONCOIN/DIVERSE	0	0	(N/A)
				TOTAL KVA	6.46	6.63	
				BALANCED THREE PHASE AMPS		18.4	

PHASE BALANCE PERCENT: PHASE A 101% PHASE B 87% PHASE C 112%

EL = EXISTING LOAD, RELOCATED TO THIS PANEL



1 PARTIAL MODIFIED DISTRIBUTION DIAGRAM
SCALE: NONE

MATERIAL SCHEDULE

ITEM:	SYMBOL:	DESCRIPTION:	MANUFACTURER:
1		ELECTRICAL EQUIPMENT CONNECTION; SIZE CONNECTION PER THE NATIONAL ELECTRICAL CODE, UNLESS LARGER CAPACITY IS NOTED OTHERWISE. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.	
2		ELECTRICAL CONNECTION TO MOTORIZED EQUIPMENT; SIZE CONNECTION PER THE NATIONAL ELECTRICAL CODE, UNLESS LARGER CAPACITY IS NOTED OTHERWISE. COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN.	
3	Φ_G	DUPLEX GROUND-FAULT RECEPTACLE; STRAIGHT BLADE, 20-AMPERE, SPECIFICATION GRADE, 3-WIRE GROUNDING TYPE, IMPACT RESISTANT THERMOPLASTIC FACE, TEST AND RESET BUTTONS IN FACE, FEDERAL SPECIFICATION AND U.L. LISTED, 2003 U.L. 943 COMPLIANT.	HUBBELL 5300 SERIES LEVITON PASS & SEYMOUR COOPER
4	$\Phi_{G/W}$	DUPLEX GROUND-FAULT WEATHERPROOF RECEPTACLE; STRAIGHT BLADE, 20-AMPERE SPECIFICATION GRADE, 3-WIRE GROUNDING TYPE, IMPACT RESISTANT THERMOPLASTIC FACE, TEST AND RESET BUTTONS IN FACE, FEDERAL SPECIFICATION AND U.L. LISTED, 2003 U.L. 943 COMPLIANT WITH WEATHERPROOF BOX AND GASKETED COVERPLATE, NEMA 4 RATED "WHILE-IN-USE".	HUBBELL 5300 SERIES/ WPM826MP LEVITON PASS & SEYMOUR COOPER
5	PANEL PP-2A	EXISTING PANEL BOARD TO REMAIN, 400 AMP, 480/277 VOLT, 3 PHASE, 4 WIRE PROVIDE NEW BREAKERS AS INDICATED IN SCHEDULES, AND ON PLANS AND DETAILS.	EXISTING CUTLER-HAMMER POW-R-LINE C PRL3a
6	PANEL LRP-2B	EXISTING 2-SECTION PANEL BOARD (L=LEFT, R=RIGHT) TO REMAIN, 225 AMP, 208/120 VOLT, 3 PHASE, 4 WIRE PROVIDE NEW BREAKERS AS INDICATED IN SCHEDULES, AND ON PLANS AND DETAILS.	EXISTING CUTLER-HAMMER POW-R-LINE C PRL1a
7	PANEL LRP-2B2	NEW SURFACE MOUNTED PANEL BOARD, 100 AMP, 208/120 VOLT, 3 PHASE, 4 WIRE PROVIDE BREAKERS AS INDICATED IN SCHEDULES, AND ON PLANS AND DETAILS.	SQUARE D NQ SERIES EATON GE-INDUSTRIAL SEIMENS
8	$\$_M$	FRACTIONAL HORSEPOWER MANUAL MOTOR SWITCH, 120-VOLT, LOCKABLE IN THE 'OFF' POSITION, WITH PILOT LIGHT AND NEMA 1, 3R, OR 4X ENCLOSURE, AS INDICATED OR REQUIRED FOR APPLICATION. SIZE AND QUANTITY OF POLES SHALL MATCH EQUIPMENT DEVICE IS SERVING.	SQUARE D CLASS 2510, TYPE K ALLEN-BRADLEY EATON GE INDUSTRIAL SEIMENS
9	J	ELECTRICAL JUNCTION BOX SIZED PER NEC REQUIREMENTS	
10		COMBINATION NEMA MAGNETIC MOTOR CONTROLLER/DISCONNECT SWITCH, 600-VOLT, HEAVY DUTY, LOCKABLE IN OFF POSITION, PROVIDE GROUND LUG, UL LISTED. COORDINATE ENCLOSURE TYPE WITH LOCATION. SIZE AND QUANITY OF POLES SHALL MATCH EQUIPMENT DEVICE IS SERVING. THERMAL UNITS SHALL BE SELECTED WITH CONNECTED EQUIPMENT MANUFACTURER'S INFORMATION. VERIFY CONTROL COIL VOLTAGE WITH OWNER PRIOR TO ORDERING.	SQUARE D CLASS 8538 ALLEN-BRADLEY EATON GE INDUSTRIAL SEIMENS
11		EXISTING DUCT SMOKE DETECTOR WITH SAMPLE TUBES TO BE REMOVED AND REINSTALLED AT NEW LOCATION. SEAL OLD OPENING IF DUCT IS TO REMAIN. PROVIDE NEW SAMPLE TUBES PRIOR TO REINSTALLING. ALL WIRING, TERMINATION, AND TESTING SHALL BE BY OWNER'S SERVICE CONTRACTOR (INTERFACE SECURITY SYSTEMS 309-745-8922)	EXISTING
12	AR	ADDRESSABLE RELAY FOR CONTROL OF AHU FAN SHUTDOWN UPON ACTIVATION OF DUCT SMOKE DETECTOR. ALL WIRING, TERMINATION, AND TESTING SHALL BE BY OWNER'S SERVICE CONTRACTOR (INTERFACE SECURITY SYSTEMS, 309-745-8922).	

EQUIPMENT CONNECTION SCHEDULE

CALLOUT	SYMBOL	VOLTS	AMPS	HP	BREAKER	CIRCUIT	NOTE 1
AHU-1		480V 3P 3W	185		300/3	PP-2A-31,33,35	250A OCD FURNISHED IN AHU
DU-1 (ON ROOF)		480/277V 2P 3W	27		35/2	PP-2A-8,10	
EF-1 (ON ROOF)		480V 3P 3W	4.8	3 HP	15/3	PP-2A-26,28,30	
EF-2 (ON ROOF)	$\$_M$	120V 1P 2W	5.8	1/4 HP	20/1	LRP-2B2-9	
GP-1		120V 1P 2W	9.8	1/2 HP	20/1	LRP-2B2-3	PROVIDE CORD AND PLUG
HEAT TRACE		120V 1P 2W	10				
HWP-1	$\$_M$	120V 1P 2W	13.8	3/4 HP	25/1	LRP-2B2-1	
HWP-2	$\$_M$	120V 1P 2W	4.4	1/6 HP	20/1	LRP-2B2-7	
HWP-3	$\$_M$	120V 1P 2W	20	1.5 HP	40/1	LRP-2B2-5	
PURGE FAN		208V 3P 3W	7.85	2 HP			

GENERAL ELECTRICAL DEMOLITION NOTES:

1. THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF WORK REQUIRED FOR THIS PROJECT. THEY ARE NOT INTENDED TO INDICATE THE LOCATION OF ALL JUNCTION BOXES, CONDUITS, ETC.. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO VERIFY ALL RELEVANT EXISTING CONDITIONS.
2. DISCONNECT ALL ELECTRICAL SYSTEMS AS REQUIRED IN ANY STRUCTURES SCHEDULED FOR REMOVAL.
3. ELECTRICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN (i.e., FOR MAINTENANCE PROPOSES).
4. PROVIDE TEMPORARY WIRING AND ASSOCIATED CONNECTIONS AS REQUIRED TO MAINTAIN EXISTING SYSTEMS OPERATION DURING CONSTRUCTION. ASSUME ALL EQUIPMENT MUST REMAIN OPERATIONAL DURING CONSTRUCTION UNLESS SPECIFICALLY NOTED OTHERWISE.
5. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE OWNER BEFORE TURNING OFF POWER TO CIRCUITS, FEEDERS, PANELS, ETC. COORDINATE ALL OUTAGES WITH OWNER.
6. DEMOLISH AND REMOVE EXISTING CONSTRUCTION ONLY TO THE EXTENT REQUIRED BY NEW CONSTRUCTION AND AS INDICATED. USE METHODS REQUIRED TO COMPLETE WORK WITHIN LIMITATIONS OF GOVERNING REGULATIONS AND AS INDICATED IN THESE NOTES.
7. WHERE ELECTRICAL DEVICES ARE BEING REMOVED, OR OTHER EQUIPMENT IS BEING ELECTRICALLY DISCONNECTED FOR REMOVAL BY OTHERS, ALL ASSOCIATED CONDUIT AND WIRE BACK TO THE PANEL BOARD OR JUNCTION BOX SERVING THE DEVICE/EQUIPMENT SHALL ALSO BE REMOVED, UNLESS THE CONDUIT CAN BE REUSED FOR NEW CONDUCTORS, OR UNLESS NOTED OTHERWISE.
8. SEAL ALL UNUSED OPENINGS DUE TO REMOVAL OF ELECTRICAL EQUIPMENT TO MATCH EXISTING CONSTRUCTION. ALL UNUSED OPENINGS IN FIRE RATED WALLS SHALL BE SEALED WITH A UL LISTED FIRE SEALING SYSTEM TO MATCH THE EXISTING FIRE RATING.
9. THIS CONTRACTOR SHALL COORDINATE ALL HIS WORK WITH OTHER CONTRACTORS AT THE JOB SITE BEFORE REMOVING EXISTING ELECTRICAL ITEMS AND/OR INSTALLING NEW ITEMS.
10. EXISTING CONDUIT IN GOOD CONDITION, MAY BE REUSED IN PLACE. RELOCATED EXISTING CONDUIT SHALL NOT BE ALLOWED. BONDING CONDUCTORS SHALL BE INSTALLED IN ALL REUSED CONDUIT TO ASSURE PROPER GROUND PATH.
11. EQUIPMENT REMOVAL IN CERTAIN LOCATIONS MAY REQUIRE THE INSTALLATION OF A JUNCTION TO RECONNECT CIRCUITS OR EQUIPMENT THAT REMAIN IN OPERATION. EXTEND CONDUIT AND WIRING AS REQUIRED TO MAINTAIN CIRCUIT TO REMAINING EQUIPMENT. THIS INCLUDES LOW-VOLTAGE SYSTEMS (FIRE ALARM, SECURITY, COMMUNICATIONS, DATA, ETC.).
12. PROCEED WITH SELECTIVE DEMOLITION SYSTEMATICALLY.
13. TRANSPORT DEMOLISHED MATERIALS FROM OWNER'S PROPERTY AND LEGALLY DISPOSE OF THEM.
14. REMOVE, STORE, CLEAN, REINSTALL, RECONNECT, AND MAKE OPERATIONAL ALL COMPONENTS INDICATED FOR RELOCATION.
15. DO NOT INTERRUPT EXISTING UTILITIES SERVING OCCUPIED OR OPERATING FACILITIES EXCEPT WHEN AUTHORIZED IN WRITING BY OWNER AND AUTHORITIES HAVING JURISDICTION. PROVIDE TEMPORARY SERVICES DURING INTERRUPTIONS TO EXISTING UTILITIES AS ACCEPTABLE BY OWNER AND AUTHORITY HAVING JURISDICTION.

GENERAL ELECTRICAL NOTES:

1. ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL CODES INCLUDING BUT NOT LIMITED TO THE NATIONAL ELECTRICAL CODE, THE INTERNATIONAL BUILDING CODE, AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES AND ASHORE 90.1. THE AUTHORITY HAVING JURISDICTION SHALL HAVE THE FINAL DECISION ON ALL INSTALLATIONS AND PRACTICES.
2. REFER TO THE MATERIAL SCHEDULE AND OTHER ASSOCIATED SCHEDULES FOR MANUFACTURERS AND DESCRIPTIONS OF EQUIPMENT.
3. ALL ELECTRICAL CONDUCTORS SHALL BE STRANDED COPPER WITH TYPE THHN-THWN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE. THE MINIMUM WIRE SIZE SHALL BE #12 AWG.
4. CIRCUIT IDENTIFICATION NUMBERS ARE TO COORDINATE CIRCUITING WITH THE ASSOCIATED PANEL. THE CIRCUIT NUMBERS SHALL BE FIELD MODIFIED TO BALANCE THE ELECTRICAL LOAD ON ALL THREE PHASES AS EVENLY AS POSSIBLE.
5. ALL NEW FEEDERS AND CIRCUITS SHALL HAVE DEDICATED NEUTRALS (WHERE NEUTRALS ARE REQUIRED).
6. A GREEN GROUNDING CONDUCTOR SHALL BE CONNECTED TO ALL LOADS SERVED. THE CONDUCTOR SHALL BE SIZED PER THE NATIONAL ELECTRICAL CODE TO ACCOMMODATE THE LOAD SERVED. ALL GROUNDING CONDUCTORS SHALL BE INSTALLED IN CONDUIT.
7. ALL BUILDING WIRING SHALL BE INSTALLED IN CONDUIT. MINIMUM SIZE SHALL BE 3/4".
8. MC CABLING IS NOT PERMITTED.
9. ALL CONDUITS SHALL BE CONCEALED IN WALLS, ABOVE CEILINGS, ETC. WHERE POSSIBLE. ALL EXPOSED SURFACE RACEWAY SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO WALLS AND CEILINGS.
10. ALL CUTTING AND PATCHING REQUIRED FOR CONDUITS, DEVICES OR OTHER ELECTRICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
11. ALL PENETRATIONS THROUGH FIRE-RATED WALLS, FLOORS, AND CEILINGS SHALL BE SEALED WITH AN APPROVED FIRE-RATED SYSTEM EQUAL TO OR EXCEEDING THE RATING OF THE MATERIAL PENETRATED.
12. EQUIPMENT SHALL BE MOUNTED TO AVOID ANY INTERFERENCE WITH OTHER EQUIPMENT OPERATION OR ACCESS. ALL INSTALLATIONS OF ELECTRICAL CONNECTIONS TO EQUIPMENT SUPPLIED BY OTHERS SHALL BE COORDINATED AND APPROVED BY SUPPLYING CONTRACTOR PRIOR TO ROUGH-IN.
13. BOXES LOCATED ON OPPOSITE SIDES OF FIRE RATED WALLS SHALL BE OFFSET A MINIMUM OF 24" OR A FIRE RATED MATERIAL EQUAL TO OR GREATER THAN THE FIRE WALL MATERIAL RATING SHALL BE INSTALLED AROUND THE BOX. BOXES LOCATED ON OPPOSITE SIDES OF NON-FIRE RATED WALLS SHALL BE OFFSET A MINIMUM 6".
14. LINE TYPE KEY:
    - a. NEW WORK BY THE ELECTRICAL CONTRACTOR
    - b. NEW WORK BY OTHERS OR EXISTING WORK TO REMAIN
    - c. EXISTING WORK TO BE DEMOLISHED BY THE ELECTRICAL CONTRACTOR
15. INDICATES THE TYPE OF CONDUCTORS IN THE CONDUIT. VERIFY QUANTITY FOR EACH SPECIFIC LOAD SERVED.
    - GROUND CONDUCTOR
    - PHASE CONDUCTOR
    - NEUTRAL CONDUCTOR
16. CONDUCTOR TICK MARKS INDICATED ON CONDUITS DO NOT REPRESENT THE QUANTITY OF CONDUCTORS IN THE CONDUIT, BUT THE TYPE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE REQUIRED QUANTITY OF GROUND, NEUTRAL, PHASE, AND SWITCH LEGS IN EACH CONDUIT.
17. ALL REQUEST FOR CHANGES ON THIS PROJECT SHALL INCLUDE A DETAILED BREAKDOWN OF MATERIALS, LABOR AND SUBCONTRACTORS. SUPPLIER BACK-UP PRICING SHALL BE INCLUDED ON THE SUPPLIER'S LETTERHEAD.

KEYED ELECTRICAL NOTES (THIS SHEET):

1. RELOCATE EXISTING UNKNOWN LOADS FROM EXISTING RIGHT SECTION OF PANEL 'LRP-2B' TO MAKE SPACE FOR NEW SUB-PANEL FEEDER BREAKER.

NOTE:
LOADS INDICATED ON EXISTING PANELS ARE BASED ON EXISTING PANEL DIRECTORIES AND MARKED NOTES ON PANELS. CONTRACTOR SHALL INCLUDE ANY KNOWN CORRECTIONS ON NEW MACHINE PRINTED PANEL DIRECTORIES, COMPLYING WITH NFPA 70-408.4. HANDWRITTEN PANEL CIRCUIT DIRECTORIES OR MODIFICATIONS ARE NOT ALLOWED. PROVIDE NEW DIRECTORIES FOR EVERY NEW OR EXISTING PANEL WITH MODIFICATIONS DONE THROUGH THIS PROJECT.

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GENERAL ELECTRICAL NOTES & SCHEDULES

HVAC CHILLER REPLACEMENT
RIVERPLEX RECREATION AND WELLNESS CENTER
600 NE WATER ST.
PEORIA, ILLINOIS 61603

NO.	ISSUE	DATE
1	BID DOCUMENTS	12.15.20

LICENSED PROFESSIONAL ENGINEER
BRIAN R. KEITH
062-050306
EXPIRES: 30NOV21
STATE OF ILLINOIS
DATE: 02/02/2021

DATE	PROJECT NO.
12.15.20	2015904.19
DRAWN BY: TDC	SHEET
CHECKED: TDC	E200
APPROVED: BRK	4 OF 4