Small Procurement for Construction

McLaughlin Youth Center
Domestic Supply Line Replacement & Restroom Fixture Upgrade
Project No. ANC 24-17C

You are invited to submit a quote to provide all labor, supervision, permits and materials to; Remove and replace the domestic supply water line and selected bathroom fixtures in accordance with drawings and specifications. The Water line and fixtures are currently in use and will remain in use with coordinated shutdowns for pipe and fixture replacement. Water piping is in a utilidor within the building and fixtures are in detention areas.

A pre-bid walk through is scheduled for Thursday April 18, 2024, at 9:00 A.M. The property is located at 2600 Providence Dr, Anchorage, AK 99507. We will be meeting at the maintenance shop entrance located off of Piper St and Buhite Drive on the south side of the facility. Please DO NOT go to the main entrance on Providence Drive.

Bids must be received before 2:00 PM local time April 30, 2024, at the Email address listed in the bid documents. michael.fleming@alaska.gov

The project completion date is 90 days after NTP.

Please direct all project or site related inquiries to Michael Fleming, Project Manager at (907) 269-7820 or michael.fleming@alaska.gov

PLEASE NOTE: Emailing your bid does not mean it arrived by the designated bid opening time. It would be in your best interest to send your bid early and not wait until the last minute. You may also call Michael Fleming at (907) 269-7820 to confirm he received your bid – The State cannot be held responsible for power and/or phone outages, network slowdowns or other problems that may cause your bid to arrive late.

Issued: April 3, 2024

Small Procurement for Construction

McLaughlin Youth Center Domestic Supply Line Replace & Restroom Fixture Upgrade
Project No. ANC 24-17C

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Issued: April 3, 2024

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES
FMS FACILITIES

INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

Project Name & No.: McLaughlin Youth Center Domestic Supply Line & Restroom Fixture Upgrade, Project ANC 24-17C Location 2600 Providence Dr, Anchorage AK, 99507	Procurement Agency and Address: State of Alaska, DFCS/FMS Facilities 3601 C Street - Suite 290 Anchorage, AK 99801 (907) 269-7820 michael.fleming@alaska.gov
Contracting Officer: Michael Fleming, DFCS Fac Mgr 2	Date of Issuance: 4/3/2024

DESCRIPTION OF WORK, REQUIRED COMPLETION DATE, LISTING OF ATTACHMENTS:

Provide all labor, supervision, permits and materials to; Repair the domestic supply line and upgrade restroom fixtures at the MYC. See scope of work for additional mandatory compliance.

Quotes that exceed $25,000 must file mandatory bi-weekly certified payrolls - See SPECIAL NOTICE TO BIDDERS for other pertinent DOLWD requirements. Work shall be completed by **90 Days After NTP**.

To be considered responsive, Contractor must provide a current copy of their business license and any required registrations with their Quote Submittal.

The Project cost estimate is: ☐ under $ 10,000 ☒ $ 10,001 - $ 50,000 ☐ $50,001-$ 100,000 ☐ $100,001-$ 200,000 *

***Base Bid Quotes in excess of $200,000 will be deemed non-responsive.**

Davis-Bacon Wages (Title 36.05) will be required if the project cost is $25,000 or more. At that amount, online filing with Dept. of Labor and certified payrolls will also be required by the contractor.

The following insurance is required: ☒ Workers Comp ☒ General Liability ☒ Automobile

Quotes for furnishing all labor, equipment and materials and performing all work for the above Project are invited. All quotes must be received before **N/A** local time on the **N/A** . Late quotes cannot be accepted. Disadvantaged Business Enterprises (DBE's) may submit quotes and will not be discriminated against on the grounds of race, color, national origin or sex in consideration for an award which results from this invitation. Any errors, omissions, or questions pertaining to solicitation procedures or project requirements, requests for additional documents, or inquiries pertaining to site conditions or scheduled visits must be made to: Michael Fleming, BMS at email michael.fleming@alaska.gov or telephone at 1- (907) 269-7820. Applicable provisions of AS 36.30 and 2 AAC 12 govern this solicitation.

SUBMITTAL OF QUOTES: Quotes for this project must be submitted in the manner noted below. All contractors must familiarize themselves with the *Instructions to Bidders*, page 2 of this form, prior to submitting their quote.

☐ - VERBAL QUOTES SHALL BE GIVEN TO _____ AT THE ABOVE NOTED TELEPHONE NUMBER, PRIOR TO THE STATED DEADLINE.

☒ - WRITTEN QUOTES, INCLUDING AMENDMENTS OR WITHDRAWALS, MUST BE RECEIVED PRIOR TO THE ABOVE NOTED DEADLINE. QUOTES MUST BE SUBMITTED ON FORM SPC-002, QUOTE SUBMITTAL, ATTACHED.

Written quotes will be submitted by email to michael.fleming@alaska.gov.

Quote for Project:

Name: McLaughlin Youth Center Domestic Supply Line & Restroom Fixture Upgrade,
Number: Project ANC 24-17C
Attn: Michael Fleming, BMS

Procurement Agency Address:

Dept. of Family & Community Services/Facilities
3601 C Street Suite 290
Anchorage, AK 99501

Quote amendments or withdrawals must be made in writing to the individual of the Procurement Agency receiving the quotes and must be received prior to the time for quote submittal.

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES
FMS FACILITIES

INVITATION FOR QUOTES FOR A SMALL PROCUREMENT (CONSTRUCTION RELATED)

INSTRUCTIONS TO BIDDERS

The State of Alaska desires that all contractors submitting quotes on construction contracts are given a fair and equal opportunity to compete. Contractors are required to follow these instructions:

REVIEW THE PROJECT DOCUMENTS: Most construction projects in excess of $1,000 will have some type of written documentation prepared expressly for the work. If you are asked to submit a quote and no written information has been provided, you should ask the procurement agency for written documentation. If the scope of services has been described to you verbally, and you are selected for contract award, you must ensure that the information of the services to be performed (scope of work) is put in writing prior to accepting the contract. When providing a quote, carefully review and consider all materials related to the solicitation and work of the contract. **By submitting a quote the contractor warrants that they are familiar with the project requirements, have visited or otherwise examined the site, and are aware of the conditions to be encountered.** Contractors can verify the contents and completeness of their documents by contacting the procurement agency individual named on the front of this form.

SUBMITTING THE QUOTE: The quote must be submitted in one of the following formats as called for in the invitation:

1. **VERBAL –** in addition to the quote, the contractor must provide the following information: (1) their valid Alaska Business License number, (2) if applicable, proof that they are an Alaskan Veteran Bidder, (3) if applicable, valid Contractor's Registration number, (4) their intended use of Alaskan products, (5) the carrier's name and policy number for their Workers' Comp Insurance (or a statement of sole proprietorship, if applicable), (6) mailing address, and (7) the Employer (Tax) Identification Number or Social Security Number. The Procurement Agency will enter this information on the quote schedule.

2. **WRITTEN -** if a written quote is solicited, the contractor must complete, in ink or typewritten, the *Small Procurement Quote Submittal Form* SPC-002. Failure to acknowledge receipt of addenda or to execute the form correctly and completely may disqualify the quote.

NOTE: The *Department of Labor requires a contractor to be licensed and registered for the required type of work prior to submitting a quote. If the procurement agency determines that the contractor is improperly registered or licensed, their quote may be deemed nonresponsive.*

SUBCONTRACTOR LISTING: Subcontractors intended to be utilized on this contract must be listed in the response to the solicitation. Work shall not be awarded to any subcontractor without prior approval from the procurement agency. Subcontractors may be added or removed only as approved by the procurement agency.

DETERMINATION OF THE LOWEST RESPONSIBLE QUOTE AND CONTRACT AWARD: Following receipt and determination of all **responsive** oral, written or sealed quotes, the procurement agency will compare the quotes and determine the lowest quote. If the procurement agency discovers a discrepancy between the unit price and the extended amount; the unit price will prevail. Conditioned quotes, unless expressly requested, will not be considered. When the quote schedule is composed of a basic amount with alternates, the procurement agency will base its determination of the low quote and the amount of the contract award solely upon those quotes, basic and alternates that are priced within the extent of available construction funds. Alternates will be considered for award in the order listed, except that if the order of award is not affected, the award may include any combination of funded alternates, or none, as may be in the best interest of the procurement agency.

When determining the lowest quote, the procurement agency will also give a 5% Alaska Bidder, 5% Alaska Veteran preference, and an appropriate Alaska Products preference to quotes designating the applicability of any of these preferences. To qualify for the Alaska Bidder preference (per AS 36.30.170) the person must (1) hold a current Alaska business license, (2) submit the quote for goods or services under the name appearing on the business license, (3) has maintained a place of business within the state staffed by the bidder, or an employee of the bidder, for a period of six months immediately preceding the date of the quote; (4) is incorporated or qualified to do business under the laws of the state, is a sole proprietorship and the proprietor is a resident of the state, is a limited liability company organized under AS 10.50 and all members are residents of the state, or is a partnership under AS 32.05 or AS 32.11 and all partners are residents of the state; and, (5) if a joint venture, is composed entirely of venturers that qualify under (1) - (4) of this subsection. AS 36.30.170(b). If a bidder qualifies for the Alaska Bidder preference, under AS 36.30.170(b), and is a qualifying entity as defined in AS 36.30.175, they will be awarded an Alaska Veteran preference of five percent (5%). The preference will be given to a (1) sole proprietorship owned by an Alaska Veteran; (2) partnership under AS 32.06 or AS 32.11 if a majority of the partners are Alaska Veterans; (3) limited liability company organized under AS 10.50 if a majority of the members are Alaska Veterans; or (4) corporation that is wholly owned by individuals and a majority of the individuals are Alaska Veterans.

Upon request, a booklet fully describing the Alaska Products preference program is available from the procurement agency.

The procurement agency will make a determination of **responsibility** as required by 2 AAC 12.500. If the lowest contractor is declared responsible, the procurement agency will execute the *Notice of Award / Notice to Proceed,* Form SPC-003, and send it to the contractor for acknowledgement. If the lowest contractor is found to be nonresponsible, this process will be repeated with the second lowest contractor -- and so on until the lowest responsive and responsible contractor is determined.

NOTICE OF AWARD AND PROTEST: A written notice will be provided on all awards exceeding $25,000 (2 AAC 12.400(h)). All protests must be filed with the Commissioner of the procurement agency (or designee) and copied to the Procurement Officer. Protest procedures are described in AS 36.30.560 and 2 AAC 12.695. The extent of the protest remedy is limited to quote preparation costs (AS 36.30.585).

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES
FMS FACILITIES

SMALL PROCUREMENT QUOTE SUBMITTAL (CONSTRUCTION RELATED)

[per AS 36.30.320(a)]

Project Name & No.: McLaughlin Youth Center Domestic Supply Line & Restroom Fixture Upgrade, Project ANC 24-17C Location: 2600 Providence Dr, Anchorage AK. 99507	Procurement Agency and Address: State of Alaska, DFCS/FMS Facilities 3601 C Street - Suite 290 Anchorage, AK 99801 (907) 269-7820 michael.fleming@alaska.gov
Contracting Officer's Signature: Michael Fleming, Fac Mgr 2	Date of Issuance: April 3, 2024 **Bid is Due: 4/30/2024 @ 2:00PM**

Offeror to Complete this Portion

QUOTE: Offerors must read all attachments to this schedule. Provide all labor, supervision, permits and materials to; Repair/replace the domestic water supply line and upgrade restroom fixtures.

a. Lump Sum – Total Basic Bid: $_____

b. Alaska Bidder's Preference: (5% of a.) $_____

c. Alaska Veterans Preference: (5% of a.) $_____

d. Alaska Products Preference: (Attach worksheet(s)) $_____

e. Adjusted Basic Bid: (a – b – c – d) $_____

I have reviewed the bid documents, with addenda _____, and understand the scope of services and conditions required for Project number **ANC 24-17C**. I agree to furnish all necessary labor, materials, and equipment for the above amount(s). The Work shall be accomplished in a professional manner acceptable to the Procurement Officer.

Contractor _____ Contractor Reg. No. _____

Authorized Signature _____ Title _____

Address _____

Business License # _____ EIN or SSN _____ Phone # _____

Offeror is Claiming: ☐ Alaska Bidder Preference ☐ Alaska Products Pref. (worksheet)
☐ Alaska Veteran Preference

Procurement Officer: _____
Date of Receipt of Bid: _____

STATE OF ALASKA
DEPARTMENT FAMILY & COMMUNITY SERVICES

NOTICE OF AWARD (NOA)
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

[per AS 36.30.320]

Project Name & No.: McLaughlin Youth Center Domestic Supply and Restroom Fixture upgrade – ANC 24-17C Location: 2600 Providence Dr, Ak. 99507	Procurement Agency and Address: DFCS/FMS Facilities 3601 C Street, Suite 290 Anchorage, AK 99503 (907)269-7820 michael.fleming@alaska.gov
Contracting Officer's Signature: Michael Fleming, Fac Mgr 2	Date of Issuance:

****

TO:

_____
_____
_____

FOR:
Work related to Basic Bid of: **ANC 24-17C**,
including the basic quote.
and alternate quote item(s):
_____

The Contractor Must Submit:
- Insurance
- Bonding*
- Certified Wages**
- Subcontractor List***

* ***Bonding*** - *If contract bid amount exceeds $100,000, Performance & Payment Bonds will be required for 100% of bid amount.*
** *Certified **Wages** – Contracts over $25,000 require bi-weekly Certified Payroll be submitted to the Dept. of Labor (see Special Instructions to Bidders form)*
*** *Subcontractor **List** – Contractor will be required to submit a Subcontractor list if they are utilized*

Your quote in the amount of $_____ submitted on _____, is accepted for performance of the Work described in the attached Invitation for Quotes (Form SPC-001), and the quote as submitted on the *Small Procurement Quote Submittal* (Form SPC-002), which are a part of this Contract.

The Contractor must sign, date, and return this document by **EMAIL ONLY** to: michael.fleming@alaska.gov . The Procurement Officer will then sign and return a copy to the Contractor, and the Award will be deemed made.

The Work of this contract may not commence until the Notice to Proceed (NTP) is issued.

Contractor's Signature of Contract Award Acceptance: _____Date: _____

NOTICE TO UNSELECTED OFFERORS ON PROJECTS OVER $ 25,000

In accordance with the protest rights afforded under 2 AAC 12.400(d)(2)(B) & (3), a copy of this Notice of Award is hereby provided to those individuals and businesses who submitted a response to the initial solicitation on which this award is made.

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES

NOTICE OF AWARD (NOA)
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

GENERAL CONDITIONS
[Construction Procurement under AS 36.30.320]

These terms, conditions and requirements apply to the Contract Documents describing the Work for the Project. If any provision of these Contract Documents is declared by a court to be illegal or in conflict with any law, the validity of the remaining provisions and the ensuing rights and obligations of the Parties to the contract shall not be affected.

Whenever used in these Contract Documents, the following terms shall have the indicated meaning. Any term not so defined shall have its ordinary meaning.

- **Approved or Approval** - means written approval by the Procurement Officer or authorized representative.
- **Award** - means the written acceptance of the lowest responsive and responsible quote by the Procurement Agency.
- **Contract Documents** - includes the *Invitation for Quotes for a Small Procurement,* Form SPC-001 (with Instructions - if issued), the *Notice of Award / Notice to Proceed,* Form SPC-003, any addenda, written changes, or attachments as noted in the description of the Work.
- **Procurement Officer** - the person authorized to enter into and administer the contract on behalf of the Procurement Agency.
- **Parties to the Contract** - includes the Procurement Agency, the owner Agency representing the State of Alaska, and the Contractor, being the entity contracting with the owner Agency for performance of the Work.
- **Project** - The total construction, of which the Work performed under the Contract, is the whole or part.
- **Project Manager** - the Procurement Officer's authorized representative, responsible for Contract administration.
- **Work** - is the act of, and the result from, performing services, furnishing labor, furnishing and incorporating materials and equipment into the Project and performing other duties and obligations, all as required by the Contract Documents.

1. The Procurement Officer (or authorized representative) has the authority to make findings, determinations and decisions with respect to the contract; to Approve materials, Work and payment therefore; and to modify or terminate the contract on behalf of the Procurement Agency.

2. The Contractor shall have sole responsibility for the means, methods, sequences, or procedures of construction and safety precautions related to the Project. The Contractor shall conduct all Work in such a manner that protects the public and State resources.

3. The Contractor must comply with all applicable laws, regulations, codes, ordinances and written directives issued by the Procurement Officer. In addition, the Contractor must obtain applicable licenses and permits; provide supervision, labor, tools, and new materials (except as may otherwise be provided by the Procurement Agency); and utilize Alaska Products and Wood Products when applicable (see AS 36.05.010 & AS 36.30.322). **Hazardous Materials:** The CONTRACTOR is to be aware under 29 CFR 1926.1101(k)(2)(ii) Construction Industry Standards, any building or facility constructed prior to 1980 may contain suspected Hazardous Materials. All known or perceived known Hazardous Materials information will be provided by the DEPARTMENT's facility staff to the CONTRACTOR upon request. Any new suspected Hazardous Materials encountered by the CONTRACTOR shall be made known to the DEPARTMENT within 3 business days of discovery. Once notified the DEPARTMENT will have an Environmental Assessment completed to verify if hazardous materials exist.

4. The Contractor shall not award Work to any subcontractor without prior Approval from the Procurement Officer.

5. The Procurement Agency reserves the right to make written changes to the Contract Documents for modifications within the general scope of the Work.

6. Any act or occurrence be it a result of an emergency, differing site condition or change order, which may form the basis of a claim for a price or time adjustment must be reported immediately to the Procurement Officer.

7. **The Department of Labor and Workforce Development, Wage and Hour Administration, must be notified in accordance with AS 36.05.010 and AS 36.05.030 if the resulting contract for repairs or construction exceeds $25,000.** The Contractor must comply with the requirements noted within the Department of Labor packet entitled, "Laborers' & Mechanics' Minimum Rates of Pay." To obtain a copy of the referenced packet, contact the Procurement Agency or the Department of Labor.

8. The primary contractor working on public construction projects with an amount of $25,000 or more must file a Notice of Work and pay a one percent fee based on the estimated value of work performed by the prime contractor and one percent of the value of each subcontractor's price, to the Department of Labor and Workforce Development, Wage and Hour Administration (DOLWD) - The maximum fee is $5,000.00. The notice and fees must be filed with the DOLWD before work commences on the project.

   Upon completing the construction project, the primary contractor must file a Notice of Completion (NOC) and make payment of any additional fees due to increases in the contract amounts due the primary contractor. Contractor must file the Notice of Work and Notice of Completion online. Please call the Dept. of Labor for instructions and/or assistance in filing (http://labor.alaska.gov/lss/whhome.htm).

9. The Contractor shall indemnify, save harmless, and defend the Procurement Agency, its agents and its employees in accordance with Appendix B1. Furthermore, the Contractor shall, prior to the Award of the contract, provide proof of Workmen's Compensation, General Liability, and Automobile Insurance in amounts as applicable under Appendix B1. These coverages shall remain in force for the duration of the Contract.

10. The Contractor shall remedy all defects in materials or workmanship that develop within a period of one year from the date of final payment.

11. The Procurement Agency will make final payment to the Contractor following approval of completion of all Work and the Contractor's submittal of all releases, warranties, record documents, permits and invoices. Liens or other claims relating to the Project may be withheld from final payment if written notice is first given to the Contractor. Acceptance of the final payment will constitute the Contractor's waiver to future claims.

12. Any dispute arising out of this Contract, which cannot be satisfactorily remedied by the Parties to the Contract, shall be resolved under

AS 36.30.620 - 699.

APPENDIX B[1]
BONDS, INDEMNITY AND INSURANCE

Article 1. Bonds

If Required and Noted on Page one of the Notice of Award Form SPC-003, the CONTRACTOR shall furnish Performance and Payment Bonds, each in an amount as shown on the Contract as security for the faithful performance and payment of all CONTRACTOR'S obligations under the Contract Documents. These bonds shall remain in effect for one year after the date of Final Acceptance and until all obligations under this Contract, except special guarantees as per 12.7, have been met. All bonds shall be furnished on forms provided by the DEPARTMENT (or copies thereof) and shall be executed by such Sureties as are authorized to do business in the State of Alaska. The Contracting Officer may at his option copy the Surety with notice of any potential default or liability.

At the option of the CONTRACTOR, bonds may be provided by individual Surety the adequacy of which shall be determined by the Contracting Officer. Any costs incurred by the CONTRACTOR or individual Surety shall be borne by the CONTRACTOR. Where individual Sureties are used, two individual Sureties must each provide the State of Alaska with security equal to the amount of each bond by one, or a combination of, the following methods:

a. Escrow account in the name of the DEPARTMENT for the duration of the Contract. Acceptable securities would include, but not necessarily be limited to: Cash; treasury notes; bearer instruments having a specific value, or; money market certificates.

b. First *Deed of Trust* with the DEPARTMENT designated as beneficiary, against the unencumbered value of the real property located within the State of Alaska or an agreement by any second party, including deeds of trust, mortgage, lien or judgment interests to subrogate their interests to that of the State of Alaska in the real property which has been offered by the individual Surety.

A title insurance policy with the State of Alaska as a named beneficiary and a current (within 3 months) professional appraisal or assessed valuation will be required to ascertain the true value of the property offered as collateral. If buildings or other valued improvements are involved then fire and casualty insurance with the State of Alaska as a named insured and in limits and coverages acceptable to the Contracting Officer shall be required. The appraiser shall acknowledge in writing that the appraisal is prepared for the benefit of the DEPARTMENT and the DEPARTMENT has the right to rely on its contents. This *Deed* must be recorded in the recording office where the property is located.

With respect to clauses "a" and "b" above, the *Deed of Trust* or other accepted security shall not be released until 12 months after Final Acceptance of the Project and settlement of all outstanding claims.

Replacement of Bond and Surety:

If the Surety on any bond furnished in connection with this Contract is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.2, or otherwise becomes unacceptable to the DEPARTMENT, or if any such Surety fails to furnish reports as to his financial condition as requested by the DEPARTMENT, the CONTRACTOR shall within five days thereafter substitute another bond and Surety, both of which must be acceptable to DEPARTMENT.

An individual Surety may be replaced by a corporate Surety during the course of the Contract period. If the Surety desires to dispose of the collateral posted, the DEPARTMENT may, at its option, accept substitute collateral.

Article 2. Indemnification

The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission, or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. "Contractor" and "Contracting agency", as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term "independent negligence" is negligence other than in the Contracting agency's selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor's work.

Article 3. Insurance

Without limiting Contractor's indemnification, it is agreed that Contractor shall purchase at its own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the Contractor's policy contains higher limits, the state shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the Contracting Officer prior to beginning work and must provide for a 30-day prior notice of cancellation, non-renewal or material change of conditions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the Contractor's services. All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21.

3.1 Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements.

- **The policy must waive subrogation against the State.**

3.2 Commercial General Liability Insurance: covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000, combined single limit per occurrence.

- **The State of Alaska must be named as additional insured.**

3.3 Commercial Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000, combined single limit per occurrence.

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES

ALASKA PRODUCTS PREFERENCE WORKSHEET
SMALL PROCUREMENT CONTRACT
(CONSTRUCTION RELATED)

Project Name: McLaughlin Youth Center Domestic Supply and Restroom Fixture upgrade

Project Number: ANC 24-17C

Procurement Agency: DFCS/FMS Facilities Contractor: _____

PRODUCT	MANUFACTURER	CLASS & PREFERENCE PERCENTAGE	TOTAL DECLARED VALUE	REDUCTION AMOUNT
			TOTAL	

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES

ALASKA VETERAN'S PREFERENCE AFFIDAVIT

In response to the Invitation to Bid for:

McLaughlin Youth Center Domestic Supply upgrade – **Project #ANC 24-17C**

I certify under penalty of perjury that _____
(Name) qualifies for the Alaska Veteran's Preference under the following conditions:

(a) If a bidder qualifies under AS 36.30.170(b) as an Alaska bidder and is a qualifying entity, a five percent bid preference shall be applied to the bid price (preference may not exceed $5,000). In this subsection, "qualifying entity" means a:

(1) Sole proprietorship owned by an Alaska Veteran.
(2) Partnership under AS 32.06 or AS 32.11 if a majority of the members are Alaska Veteran's.
(3) Limited Liability Company organized under AS 10.50 if a majority of the individuals are Alaska Veterans.
(4) Corporation that is wholly owned by individuals and a majority of the individuals are Alaska veterans.

(b) To qualify for a preference under this section, a bidder must add value by the bidder itself actually performing, controlling, managing and supervising a significant part of the services provided, or the bidder must have sold supplies of the general nature solicited to other state agencies, governments, or the general public.

(c) In this section, "Alaska Veteran" means an individual who is a:

(1) Resident of this state; and
(2) Veteran; means an individual who:

(A) Served in the:

(i) Armed Forces of the United States, including a reserve unit of the United States armed forces; or
(ii) Alaska Territorial Guard, the Alaska Army National Guard, the Alaska Air National Guard, or the Alaska Naval Militia; and

(B) Was separated from the service under a condition that was not dishonorable.

_____
Authorized Signature

_____ _____
Printed Name Date

STATE OF ALASKA
DEPARTMENT OF FAMILY & COMMUNITY SERVICES

SUBCONTRACTOR LIST

McLaughlin Youth Center Domestic Supply and Restroom Fixture upgrade – **Project #ANC 24-17C**

The apparent low bidder shall complete this form and submit it so as to be received by the Contracting Officer prior to the close of business on the fifth working day after receipt of written notice from the Department.

Failure to submit this form with all required information by the due date will result in the bidder being declared non-responsive and may result in the forfeiture of the Bid Security.

Scope of work must be clearly defined. If an item of work is to be performed by more than one firm, indicate the portion or percent of work to be done by each.

Check as applicable:

☐ All work on the below-referenced project will be accomplished without subcontracts greater than ½ of 1% of the contract amount.

OR

☐ Subcontractor List is as follows:

LIST FIRST TIER SUBCONTRACTORS ONLY

FIRM NAME, ADDRESS, & PHONE No.	AK BUSINESS LICENSE No. & CONTRACTOR'S REGISTRATION No.	SCOPE OF WORK TO BE PERFORMED

FIRM NAME, ADDRESS, & PHONE No.	AK BUSINESS LICENSE No. & CONTRACTOR'S REGISTRATION No.	SCOPE OF WORK TO BE PERFORMED

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

ALASKA BIDDER PREFERENCE CERTIFICATION

In response to the advertised procurement for:

Project Name and Number: __**McLauglin Youth Center Supply Line Repair, ANC 24-17C**_

Bidder/Proposer (company name): _____

Operation of Alaska Bidder Preference

Procurement preferences under the Alaska Procurement Code are benefits that the State grants only to qualified bidders. Under AS 36.30.990(2), if a bidder is an eligible "Alaska Bidder", the Department will apply a five percent preference to the price of the bidder's proposal.

Instructions regarding Alaska Bidder Preference

A bidder that claims the Alaska Bidder Preference must review and then certify that each statement appearing under the heading "Alaska Bidder Certification" is true. The individual that signs the certification shall include his/her printed name and position within bidder's organization, *e.g.*, sole proprietor, partner, etc. If a bidder fails to submit a signed certification, the Department will not apply the claimed preference.

Alaska Bidder Certification

The bidding entity for which I am the duly authorized representative:

(A) Holds a current Alaska business license;

(B) Is submitting a bid or proposal for goods, services, or construction under the name appearing on the bidder's current Alaska business license;

(C) Has maintained a place of business in the State staffed by the bidder or an employee of the bidder for a period of six months immediately preceding the date of the proposal;

(D) Is incorporated or qualified to do business under the laws of the State, is a sole proprietorship and the proprietor is a resident of the State, is a limited liability company organized under AS 10.50 and all members are residents of the State, or is a partnership under former AS 32.05, AS 32.06, or AS 32.11 and all partners are residents of the State; and

(E) If a joint venture, is composed entirely of ventures that qualify under the four preceding paragraphs of this Alaska Bidder Certification.

By applying my signature below, I certify under penalty of perjury that I am the duly appointed representative of this bidder, which has authorized and empowered me to legally bind it concerning its proposal, and that the foregoing statements are true and correct.

_____ _____
By (signature) Date

_____ _____
Printed name Alaska Business License Number

_____
Title:

Attachment I

Scope of Work

ANC 24-17C
McLaughlin Youth Center Domestic Water Supply Line Replace

Part 1 – General

SCOPE OF WORK
Contractor to provide construction proposal for the following work to take place in the McLaughlin Youth Center.

> All labor, supervision, permits and materials to remove and replace existing domestic copper supply lines and upgrade the restroom fixtures.

Contractor will ensure that all applicable local, state, and federal policies and regulations are followed. All permits will be the responsibility of the Contractor. Contractor will be responsible for disposal of any removed materials.

1.0 Submittals

A. Cost Estimate:
    a. Provide a cost estimate inclusive of total cost for demo, construction of the project.
B. Provide project schedule for entire project.

1.1 Closeout Submittals

A. Design drawings updated with any changes.
B. Operations and Maintenance Data
    a. Provide any warranty information and/or ODM's in electronic format (PDF)

1.2 Qualifications

1.3 Field Measurements

A. Verify measurements prior to ordering/fabrication.

1.4 Execution/Installation

State of Alaska Wage Rate Web Site Link.

State Wage Rates (blue)
State wage rates can be obtained at http://www.labor.state.ak.us/lss/pamp600.htm. Use the State wage rates that are in effect 10 days before Bid Opening.

State of Alaska
Department of Administration

Substitute Form W-9

Questions? Email *DOA.DOF.Vendor.HelpDesk@alaska.gov*

RETURN COMPLETED FORM TO:

Department of Administration
Division of Finance
P.O. Box 110204
Juneau, AK 99811-0204
Or FAX to: (907) 465-2169

DO NOT send to IRS

Taxpayer Identification Number (TIN) Verification

The Internal Revenue Service requires the State of Alaska to issue 1099 forms when payments to individuals, partnerships or limited liability companies for rents, services, prizes, and awards meet or exceed $600.00 for the year. An IRS Form 1099 is not required when payments are specifically for merchandise or made to some types of corporations.

Print or Type Please see attachment or reverse for complete instructions

Legal Name (as shown on your income tax return)

State of Alaska Vendor Number (if known)

Business Name, if different from above
(use if doing business as (DBA) or enter business name of Sole Proprietorship)

Primary Address (for 1099 form)
PO Box or Number and Street, City, State, Zip + 4

Remit Address (where payment should be mailed, if different from Primary Address)
PO Box or Number and Street, City, State, Zip + 4

Entity Designation (check only one type)

- ◯ Individual / Sole Proprietor
- ◯ Partnership
- ◯ General Corporation
- ◯ Medical Corporation
- ◯ Legal Corporation
- ◯ Limited Liability Company – Individual
- ◯ Limited Liability Company – Partnership
- ◯ Limited Liability Company – Corporation
- ◯ Government Entity
- ◯ Estate / Trust
- ◯ Organization Exempt from Tax - Nonprofit (under Section 501 (a)(b)(c)(d))

Exemption (See Instructions)

- ☐ Exempt payee code (if any)
- ☐ Exemption from FATCA Reporting Code (if any)

Taxpayer Identification Number (TIN) ***Provide Only One*** (If sole proprietorship provide EIN, if applicable)

Social Security Number (SSN)	**Employer Identification Number (EIN)**

If Change of Ownership or Entity Designation	**Date of Change:**
Previous Owner / Business Name	**Previous Taxpayer Identification Number (TIN)**

Certification

The Internal Revenue Service does not require your consent to any provision of this document other than the certifications required to avoid backup withholding.

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number, **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. person (including a U.S. resident alien), **AND**
4. The FATCA code(s) entered on this form (if any) indicating I am exempt from FATCA reporting is correct.

Printed Name	**Printed Title**	**Telephone Number**
Signature	**Date**	**Email Address**

Instructions for Completing Taxpayer Identification Number (TIN) Verification (Substitute W-9) -- Page 1

Legal Name

As registered with the Internal Revenue Service (IRS)

- Individuals: Enter First Name MI Last Name
- Sole Proprietorships: Enter First Name MI Last Name
- LLC Single Owner: Enter owner's First Name MI Last Name
- All Others: Enter Legal Name of Business

Business Name

- Individuals: Leave blank
- Sole Proprietorships: Enter Business Name
- LLC Single Owner: Enter LLC Business Name
- All Others: Complete only if doing business as a DBA

Primary Address

Address where 1099 tax form should be mailed.

Remit Address

Address where payment should be mailed. Complete only if different from primary address.

State of Alaska Vendor Number

Your vendor number is an eight character alphanumeric code assigned to your company in the State of Alaska's accounting system. You may contact us at the email address listed on the form if you do not know your vendor number.

Entity Designation

Check *ONE* box which describes the type of business entity.

Taxpayer Identification Number

LIST ONLY ONE: Social Security Number OR Employer Identification Number. ***See "What Name and Number to Give the Requester" at right.***

If you do not have a TIN, apply for one immediately. Individuals use federal form SS-05 which can be obtained from the Social Security Administration. Businesses and all other entities use federal form SS-04 which can be obtained from the Internal Revenue Service.

Change of Ownership or Entity Designation

This information is requested to allow taxable income to be reported correctly for both the new and old entities.

Certification

You must cross out item 2 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.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to furnish your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, or contributions you made to an IRA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold 28% of taxable interest, dividend, and certain other payments to a payee who does not furnish a TIN to a payer. Certain penalties may also apply.

What Name and Number to Give the Requester

For this type of account:	Give name and SSN of:
Individual	The individual
Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
Sole proprietorship or Single-Owner LLC	The owner [1]
For this type of account:	**Give name and EIN of:**
Sole Proprietorship or Single-Owner LLC	The owner [3]
A valid trust, estate, or pension trust	Legal entity [4]
Corporation or LLC electing corporate status on Form 8832	The corporation
Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
Partnership or multi-member LLC	The partnership
A broker or registered nominee	The broker or nominee
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

[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**, but you may also enter your business or "DBA" name. You may use either your SSN or EIN (if you have one).
[4] List first and circle the name of the legal 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.)
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.

Revised 09/29/2015

Instructions for Completing Taxpayer Identification Number (TIN) Verification (Substitute W-9) -- Page 2

Exemptions

If you are exempt from backup withholding and/or Foreign Account Tax Compliance Act (FATCA) reporting, enter in the Exemptions box any code(s) that may apply to you. See **Exempt payee code** and **Exemption from FATCA reporting code** below.

Exempt payee code

Generally, individuals (including sole proprietors) are not exempt from backup withholding. Corporations are exempt from backup withholding for certain payments, such as interest and dividends. Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.

Note. If you are exempt from backup withholding, you should still complete this form to avoid possible erroneous backup withholding.

The following codes identify payees that are exempt from backup withholding:

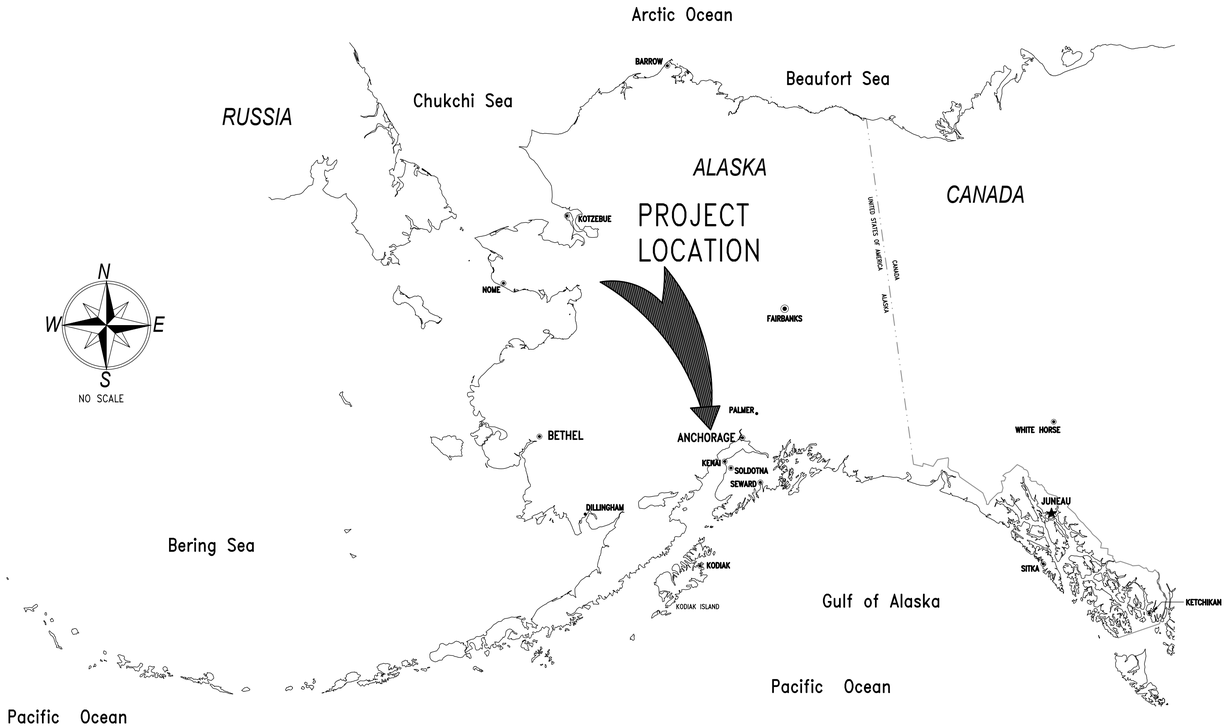
1. An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)
2. The United States or any of its agencies or instrumentalities
3. A state, the District of Columbia, a possession of the United States, 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 possession of the United States
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

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. 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 possession of the United States, 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 Reg. 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 Reg. 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

Mclaughlin Youth Facility
2600 Providence Drive
Anchorage, AK-99508



DRAWING INDEX

MECHANICAL ENGINEERING

M001 LEGEND, SCHEDULES, ABBREVIATIONS, AND DETAILS
M101 MECHANICAL DEMOLITION – AREA A
M201 MECHANICAL REMODEL – AREA A

ELECTRICAL ENGINEERING

E001 ELECTRICAL LEGEND, SCHEDULE AND LOAD CALCULATION
E101 ELECTRICAL DEMOLITION AND REMODEL PLAN

MECHANICAL & ELECTRICAL ENGINEERING

RSA
Mechanical and Electrical Consulting Engineers
670 West Fireweed Lane, Suite 200
Anchorage, AK 99503
(907) 276-0521
Corporate number: AECC542

PIPING LEGEND

- COLD WATER
- HOT WATER
- XXX — SEE ABBREVIATIONS FOR MEDIA
- PIPE UP
- PIPE DOWN
- TEE UP
- TEE DOWN
- CAP
- UNION
- BALL VALVE
- CHECK VALVE
- PRESSURE/TEMPERATURE RELIEF VALVE
- HOSE BIBB
- STRAINER W/ BLOWDOWN

LOGIC

- 5 / M2 — DETAIL NUMBER / SHEET LOCATED ON

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AMPS	AMPERES
ARCH	ARCHITECTURAL
BLDG	BUILDING
CFM	CUBIC FEET PER MINUTE
CIRC	CIRCULATING
CLG	CEILING
CONT	CONTINUED
CONN	CONNECTION
CU	COPPER
CW	COLD WATER
DIA	DIAMETER
dB	DECIBLES
DEG	DEGREE
DIM	DIMENSION
DN	DOWN
DWG	DRAWING
EFF	EFFICIENCY
EXIST	EXISTING
FT	FEET
FPM	FEET PER MINUTE
F	FAHRENHEIT
FIN	FINISHED
FLR	FLOOR
FL-X	FILTER DESIGNATOR
GA	GAUGE
GALV	GALVANIZED
GPH	GALLONS PER HOUR
GAL	GALLONS
GPM	GALLONS PER MINUTE
HD	HEAD
HW	HOT WATER
HWC	HOT WATER CIRCULATED
HP	HORSEPOWER
ID	INSIDE DAMPER
IN	INCHES
LF	LINEAL FEET
MAX	MAXIMUM
MBH	THOUSAND BTUH
MFGR	MANUFACTURER
MIN	MINIMUM
MTD	MOUNTED
NTS	NOT TO SCALE
PD	PRESSURE DROP
PG	PROPYLENE GLYCOL
PH	PHASE
PSI	POUND PER SQUARE INCH
RPM	REVOLUTIONS PER MINUTE
SP	STATIC PRESSURE
TEMP	TEMPERATURE
TTL	TOTAL
TYP	TYPICAL
UPC	UNIFORM PLUMBING CODE
VEL	VELOCITY
WC	WATER COLUMN
W/	WITH
W/O	WITHOUT
WPD	WATER PRESSURE DROP

NOTIFICATION OF POTENTIAL ASBESTOS HAZARDS:

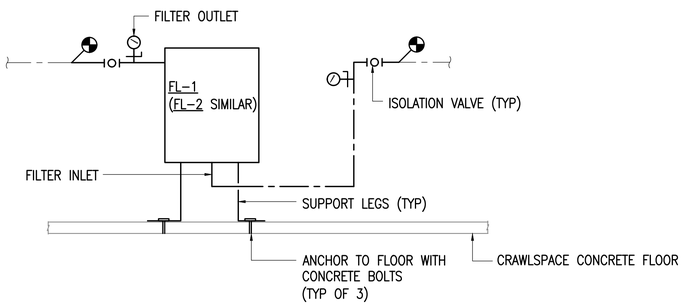
THE AREA OF WORK WITHIN THIS CONTRACT – SPECIFICALLY THE CRAWLSPACE – HAS BEEN CLEARED OF ASBESTOS AND SHOULD NOT POSE A THREAT TO WORK PERFORMED THERIN. HOWEVER, THE PLUMBING WALLS ABOVE THE FLOOR HAVE NOT BEEN TESTED FOR OR CLEARED OF ASBESTOS, AND MAY CONTAIN ASBESTOS. THE WORK PERFORMED UNDER THIS CONTRACT SHALL NOT EXTEND BEYOND THE AREAS IDENTIFIED IN THE CONTRACT DOCUMENTS, ANY WORK IDENTIFIED TO BE PERFORMED THAT IS OUTSIDE OF THE AREAS IDENTIFIED IN THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE DFCS PROJECT MANAGER BEFORE PERFORMING THE WORK. IF ANY WORK IS PERFORMED OUTSIDE OF THE AREAS IDENTIFIED IN THE CONTRACT DOCUMENTS, WHETHER DONE INTENTIONALLY OR UNINTENTIONALLY, ALL WORK SHALL CEASE IMMEDIATELY AND THE SITUATION SHALL BE BROUGHT TO THE ATTENTION OF THE DFCS PROJECT MANAGER.

PUMP SCHEDULE

				PUMPED		HEAD	ELECTRICAL			
SYMBOL	MANUFACTURER	MODEL	FUNCTION	MEDIUM	GPM	FEET	WATTS	AMPS	VOLTS/PH	REMARKS
HWCP-1	GRUNDFOS	UPS 32-160 F B	HOT WATER RECIRCULATION	WATER	14.5	36.5	625	5.8	115/1	BRONZE CONSTRUCTION FOR HOT WATER RECIRCULATION, NSF-61 LISTED, SET TO SPEED 2.

FILTER SCHEDULE

					PUMPED	FLOW	HEAD LOSS	MEDIA AREA	LISTING	
SYMBOL	MANUFACTURER	FILTER MODEL	CARTRIDGE MODEL	FUNCTION	MEDIUM	GPM	PSI	SQ. FT.		REMARKS
FL-1	HARMSCO	HUR 90 HP	POLYESTER PLUS HC 90-100 MICRON	COLD WATER FILTRATION	WATER	81	2.5	90	NSF 61	SEDIMENT REMOVAL AND PRE FILTRATION REUSABLE FILTER HOUSING, STAINLESS STEEL CARTRIDGE, CPVC STAND PIPE, BRASS WING NUTS, EPDM GASKETS, 1/4" SAMPLE PORTS FOR INLET AND OUTLET.
FL-2	HARMSCO	HUR 40 HP	POLYESTER PLUS HC 40-100 MICRON	HOT WATER FILTRATION	WATER	5	0.2	40	NSF 61	SEDIMENT REMOVAL AND PRE FILTRATION REUSABLE FILTER HOUSING, STAINLESS STEEL CARTRIDGE, CPVC STAND PIPE, BRASS WING NUTS, EPDM GASKETS, 1/4" SAMPLE PORTS FOR INLET AND OUTLET.



1 FILTER DETAIL
NO SCALE

STATE OF ALASKA — ADAM W. WILSON — ME-12619 — 09/01/23 — REGISTERED PROFESSIONAL ENGINEER

RSA Engineering, Inc.
MECHANICAL AND ELECTRICAL CONSULTING ENGINEERS
2930 West Fireweed Lane, Suite 200
Anchorage, AK 99503
Phone (907) 276-0521
Corporate No.: AECC542

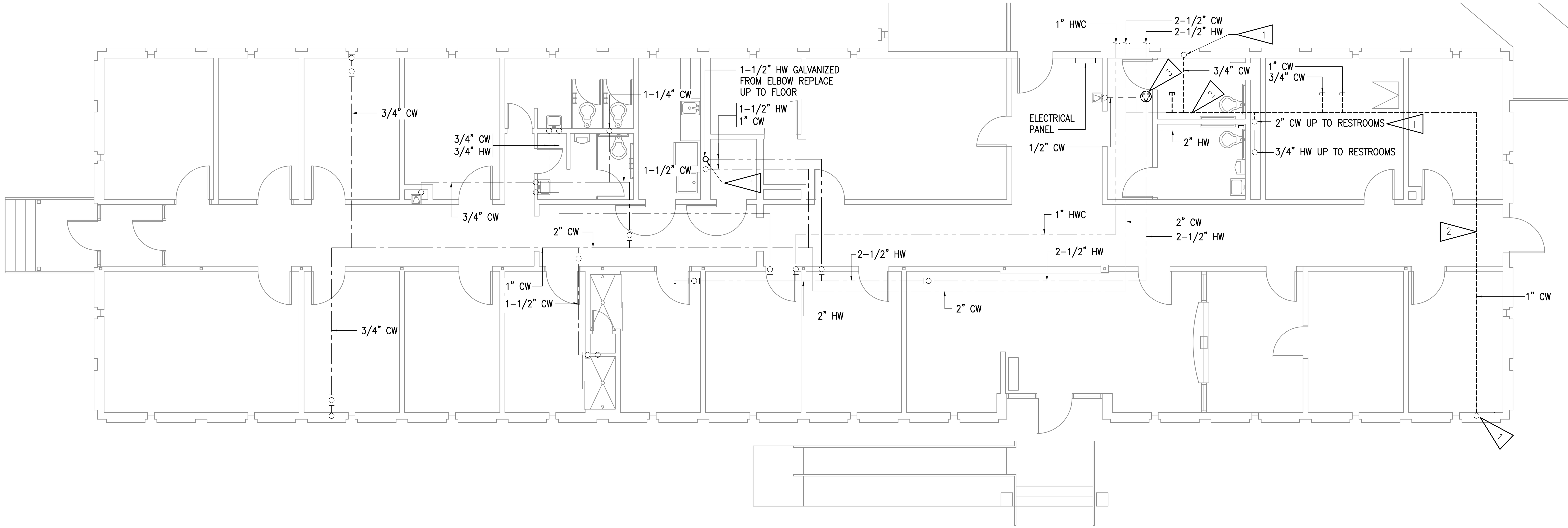
YOUTH FACILITY PIPING REPLACEMENT
MCLAUGHLIN YOUTH FACILITY
2600 PROVIDENCE DR,
ANCHORAGE ALASKA 99508

REVISIONS:

DRAWN BY: ARN, SR
CHECKED BY: MRB
DATE: 09/01/2023
JOB NUMBER: M3089
DWG FILE: MSERIES

DRAWING TITLE:
LEGEND, SCHEDULES ABBREVIATIONS AND DETAILS

SHEET:
M001



1 MECHANICAL DEMOLITION PLAN - AREA A

3/16" = 1'-0"

GENERAL NOTES:

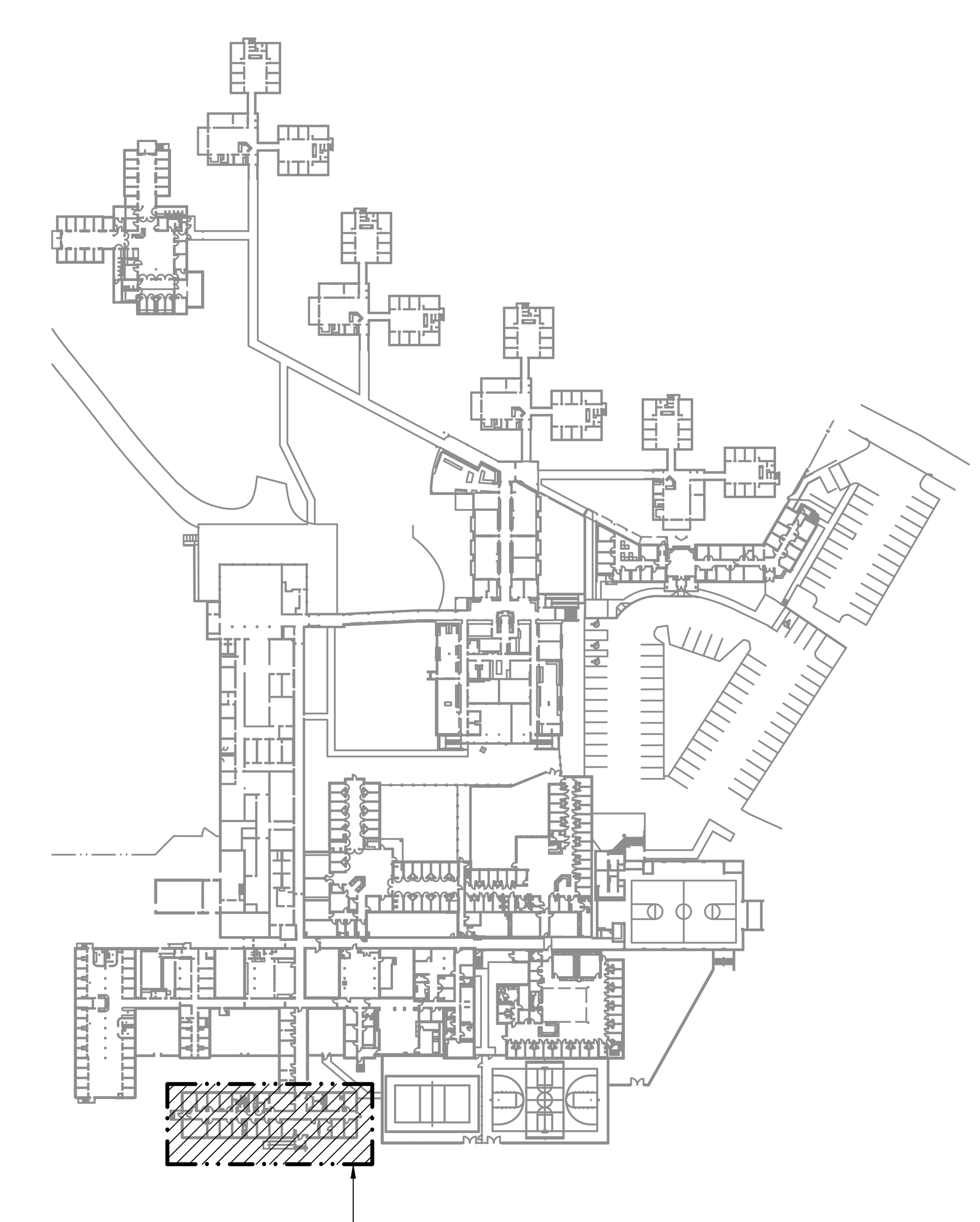
A. THE INFORMATION SHOWN ON THIS DRAWING IS TAKEN FROM AS BUILT DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE FACILITY. THERE IS NO WARRANTY OR GUARANTEE AS TO THE ACCURACY OF THE INFORMATION SHOWN HERE-IN. THE CONTRACTOR SHALL FIELD VERIFY ALL ITEMS SCHEDULED FOR DEMOLITION PRIOR TO START OF WORK.

B. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL SALVAGEABLE MATERIALS THE CONTRACTOR SHALL DELIVER SALVAGED MATERIALS TO A LOCATION AS DIRECTED BY THE OWNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

C. DASHED OR DOTTED LINES INDICATE ITEMS TO BE REMOVED. SOLID LINES INDICATE EXISTING ITEMS TO REMAIN.

SHEET NOTES: (X)

1. DEMOLISH GALVANIZED PIPING UP TO CEILING CRAWLSPACE WITH SUFFICIENT EXPOSED PIPE TO CONNECT NEW PIPING. PIPING IN AND ABOVE FLOOR TO REMAIN.
2. DEMOLISH COLD WATER PIPING TO EXTENT SHOWN.
3. DEMOLISH HOT WATER CIRCULATION PUMP AND ALL ASSOCIATED APPURTENANCES.



KEY PLAN

NO SCALE

STATE OF ALASKA
ADAM W. WILSON
ME-12619
REGISTERED PROFESSIONAL ENGINEER

RSA Engineering, Inc.
MECHANICAL AND ELECTRICAL CONSULTING ENGINEERS
670 West Fireweed Lane, Suite 200
Anchorage, AK 99503
Phone (907) 276-0521
Corporate No.: AECC542

YOUTH FACILITY PIPING REPLACEMENT

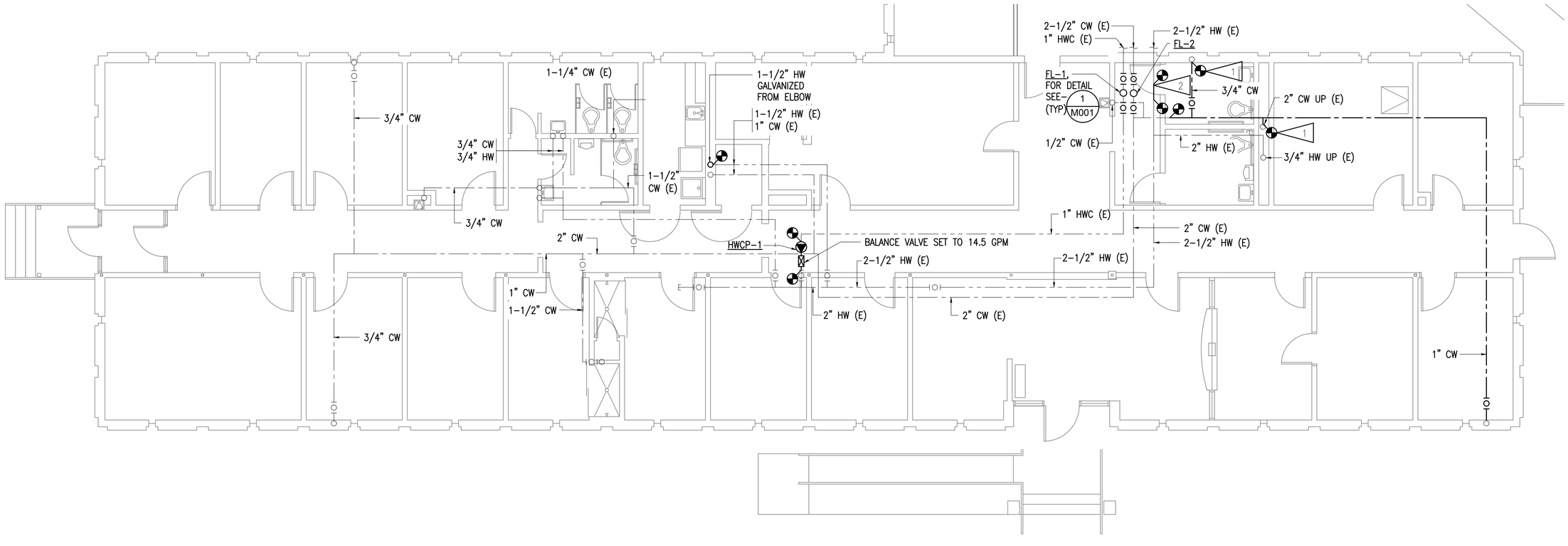
MCLAUGHLIN YOUTH FACILITY
2600 PROVIDENCE DR,
ANCHORAGE ALASKA 99508

REVISIONS:

DRAWN BY:	ARN, SR
CHECKED BY:	SR/ AWW
DATE:	09/01/2023
JOB NUMBER:	M3089
DWG FILE:	MSERIES

DRAWING TITLE:
MECHANICAL DEMOLITION - AREA A

SHEET:
M101



1 MECHANICAL REMODEL PLAN - AREA A

3/16" = 1'-0"

GENERAL NOTES:

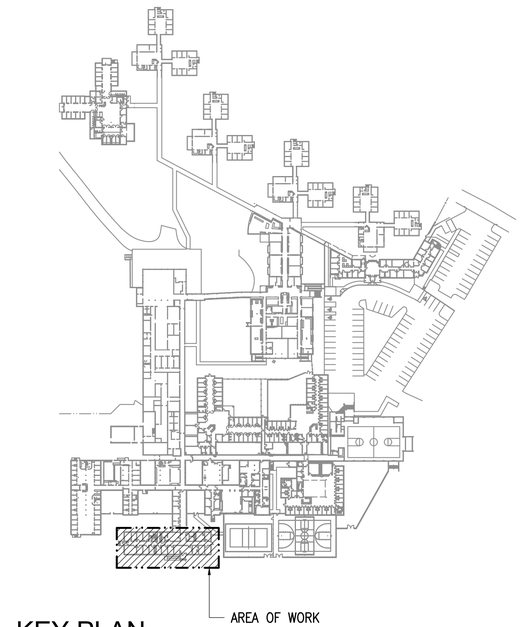
A. THE INFORMATION SHOWN ON THIS DRAWING IS TAKEN FROM AS BUILT DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE FACILITY. THERE IS NO WARRANTY OR GUARANTEE AS TO THE ACCURACY OF THE INFORMATION SHOWN HERE-IN.

B. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL SALVAGEABLE MATERIALS THE CONTRACTOR SHALL DELIVER SALVAGED MATERIALS TO A LOCATION AS DIRECTED BY THE OWNER IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

SHEET NOTES: X

1. INSTALL BRONZE ISOLATION ISOLATION VALVE WITH DI-ELECTRIC UNION ON EXISTING GALVANIZED PIPE THROUGH FLOOR AND CONNECT TO NEW COPPER PIPE.

2. INSTALL 2-1/2" PIPE IN PLACE OF DEMOLISHED RECIRCULATION PUMP.



KEY PLAN
NO SCALE

STATE OF ALASKA
ADAM W. WILSON
ME-12619
10/04/23
REGISTERED PROFESSIONAL ENGINEER

RSA Engineering, Inc.
MECHANICAL AND ELECTRICAL CONSULTING ENGINEERS
2000 West Fireweed Lane, Suite 200
Anchorage, AK 99503
Phone (907) 276-0521
Corporate No.: AECC542

YOUTH FACILITY PIPING REPLACEMENT
MCLAUGHLIN YOUTH FACILITY
2600 PROVIDENCE DR,
ANCHORAGE ALASKA 99508

REVISIONS:

DRAWN BY:	ARN, SR
CHECKED BY:	SR/ AWW
DATE:	09/01/2023
JOB NUMBER:	M3089
DWG FILE:	MSERIES

DRAWING TITLE:
MECHANICAL
REMODEL - AREA A

SHEET:
M201

LEGEND

	CONDUIT, CONCEALED	C	CONDUIT
#10	NUMBER AND SIZE OF WIRES (NO MARKS = 3 #12)	CO	CONDUIT ONLY
A–2	HOMERUN TO PANEL (PANEL AND CIRCUIT No.)	E	DENOTES EXISTING ITEM
	EXISTING PANEL	MLO	MAIN LUGS ONLY
	MOTOR (SIZED AS NOTED)	NEC	NATIONAL ELECTRICAL CODE
$\frac{1}{2}$	FRACTIONAL HORSEPOWER MOTOR STARTER	NTS	NOT TO SCALE
	DUPLEX RECEPTACLE TO BE REMOVED (DASHED OR DOTTED LINES INDICATE ITEMS TO BE REMOVED TYPICAL)	TYP	TYPICAL
1	NOTE TAG (No. INDICATES NOTE)	UON	UNLESS OTHERWISE NOTED

LOAD CALCULATION

LESS THAN 1A OF ADDITIONAL LOAD ADDED TO EXISTING DISTRIBUTION SYSTEM AND SERVICE. EXISTING SYSTEM AND SERVICE HAVE ADEQUATE CAPACITY FOR NEW LOAD ADDED.

EXISTING PANEL '7B'

MFR/MODEL: SQUARE 'D' TYPE NQOB — VOLTS: 120/208V,3PH,4W — ENCLOSURE: NEMA 1 — 100 A — MTG: SURFACE

NOTE	CIRC	POLE	AMPS	SERVICE	TYPE	VOLT-AMPS A		B		C		TYPE	SERVICE	AMPS	POLE	CIRC	NOTE
b	1	1	15	F/A RELAYS	MISC	240	1080					LTG	CRAWL LTG/RECP	20	1	2	b
b	3	1	15	F/A RELAYS	MISC			240	1080			LTG	CRAWL LTG/RECP	20	1	4	b
b	5	1	15	ABANDONED CIRCUITS							1080	LTG	CRAWL LTG/RECP	20	1	6	b
a	7	1	15	LIGHTS	LTG	1440	1920					HEAT	UNIT HEATER	20	1	8	a
b	9	1	15	F-15B,CP-3B,CP-4B	MOTR			864	1920			HEAT	UNIT HEATER	20	1	10	a
	11	1	20	SPARE							240	MISC	HONEYWELL CONTROL	20	1	12	b
a	13	1	20	COPIER	MISC	1920	240					MISC	OLD CONTROLS	20	1	14	b
b	15	1	20	NEW TTB	MISC			1200	1080			LTG	CRAWL LTG/RECP	20	1	16	b
b	17	1	20	CRAWL LTG/RECP	LTG					1080	2880	MISC	XEROX	30	1	18	a
c	**19**	**1**	**15**	**HWCP-1**	**MOTR**	**625**							ABANDONED CONTROLS	20	1	20	b
TOTAL V-A						7465		6384		5280		19,129 VA					
TOTAL AMPS						62		53		44		53 A					
A.I.C. RATING: 10,000																	

	LTG	RECP	MOTR	LG.MT	MISC	KIT	HEAT	SPEC	TOTAL	AMPS
CONNECTED LOAD IN KVA (THIS PANEL):	6.84	0.00	1.49	0.22	6.96	0.00	3.84	0.00	19.1 KVA	53 A
CONNECTED LOAD IN KVA (BRANCH PANELS):									0.0 KVA	0 A
TOTAL CONNECTED LOAD IN KVA:	6.84	0.00	1.49	0.22	6.96	0.00	3.84	0.00	19.1 KVA	53 A
DEMAND LOAD IN KVA:	8.55	0.00	1.49	0.22	6.96	0.00	4.80	0.00	22.0 KVA	61 A

PANEL NOTES:
a. LOAD ASSUMED BASED ON 80% OF BREAKER SIZE
b. LOAD ASSUMED BASED ON LOAD SERVED
c. NEW LOAD. NEW CIRCUIT BREAKER SHALL BE COMPATIBLE WITH AND LISTED FOR USE IN THE EXISTING PANEL BOARD AND SHALL HAVE A MINIMUM SHORT CIRCUIT AIC RATING TO MATCH THE LOWEST RATED EXISTING DEVICE IN THE PANEL.

PANEL OPTIONS:
MAIN LUGS ONLY

STATE OF ALASKA — PATRICK C. COLLINS — EE-13219 — 09/01/23 — REGISTERED PROFESSIONAL ENGINEER

RSA Engineering, Inc.
MECHANICAL AND ELECTRICAL CONSULTING ENGINEERS
2930 West Fireweed Lane, Suite 200
Anchorage, AK 99503
Phone (907) 276-0521
Corporate No.: AECC542

YOUTH FACILITY PIPING REPLACEMENT
MCLAUGHLIN YOUTH FACILITY
2600 PROVIDENCE DR,
ANCHORAGE ALASKA 99508

REVISIONS:

DRAWN BY: NVF
CHECKED BY: PCC, JAM
DATE: 09/01/2023
JOB NUMBER: M3089
DWG FILE: ESERIES

DRAWING TITLE:
ELECTRICAL LEGEND, SCHEDULE AND LOAD CALCULATION

SHEET:
E001

GENERAL NOTES:

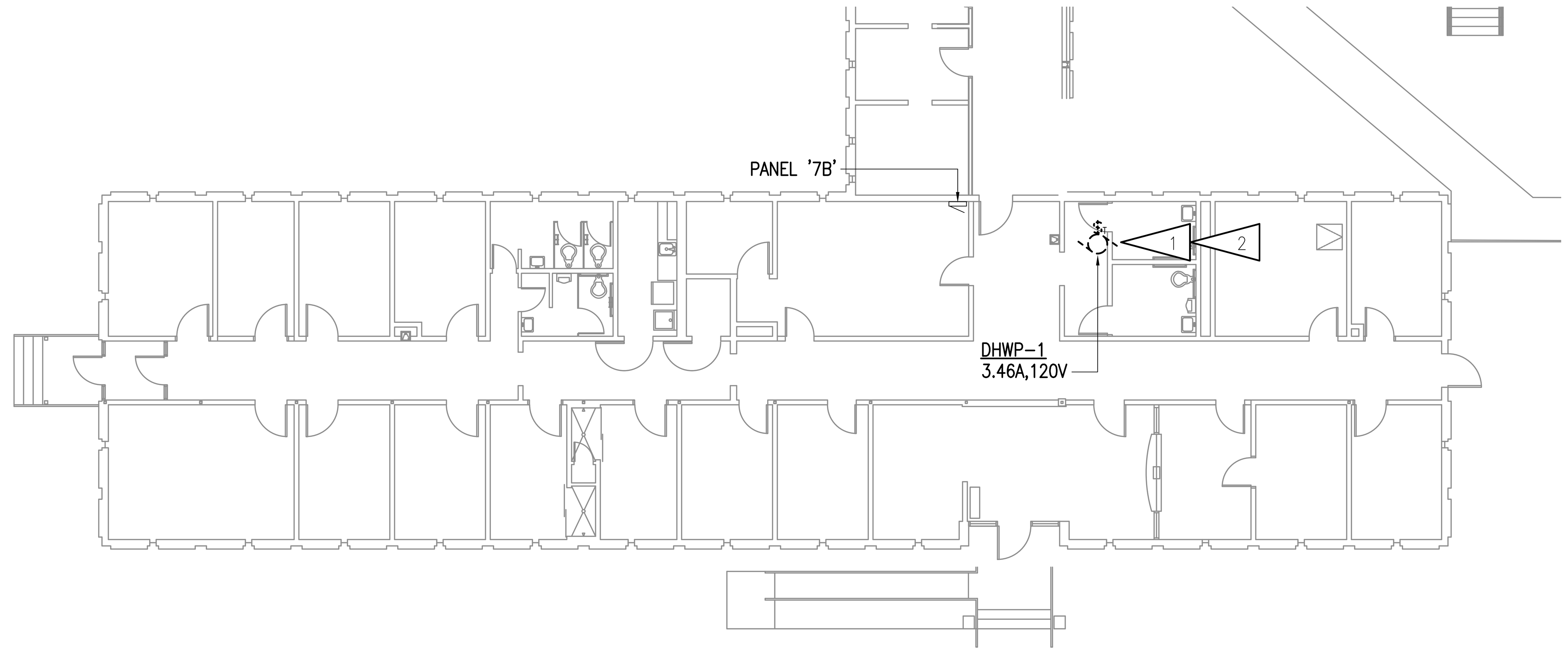
A. THE INFORMATION SHOWN ON THIS DRAWING IS TAKEN FROM RECORD DRAWINGS AND A NON-DESTRUCTIVE WALK THROUGH OF THE FACILITY. THERE IS NO WARRANTY OR GUARANTEE AS TO THE ACCURACY OF THE INFORMATION SHOWN HERE-IN. THE CONTRACTOR SHALL FIELD VERIFY ALL ITEMS SCHEDULED FOR DEMOLITION PRIOR TO START OF WORK.

B. THE OWNER SHALL HAVE FIRST RIGHT OF REFUSAL ON ALL SALVAGEABLE MATERIALS. THE CONTRACTOR SHALL DELIVER SALVAGED MATERIALS TO A WAREHOUSE AS DIRECTED BY THE OWNER. THE CONTRACTOR SHALL DISPOSE OF, OFF SITE, ALL UNWANTED MATERIALS.

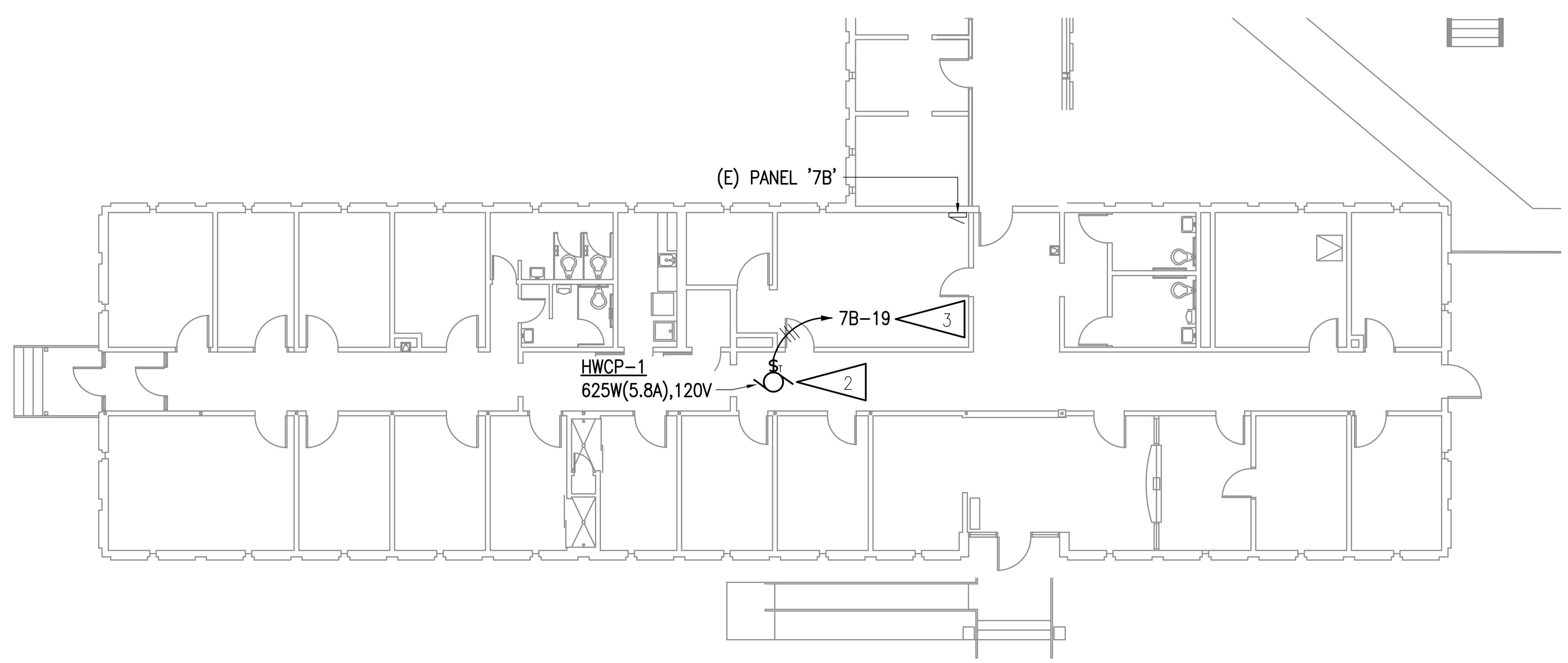
C. DASHED OR DOTTED LINES INDICATE ITEMS TO BE REMOVED. SOLID LINES INDICATE EXISTING ITEMS TO REMAIN.

SHEET NOTES:

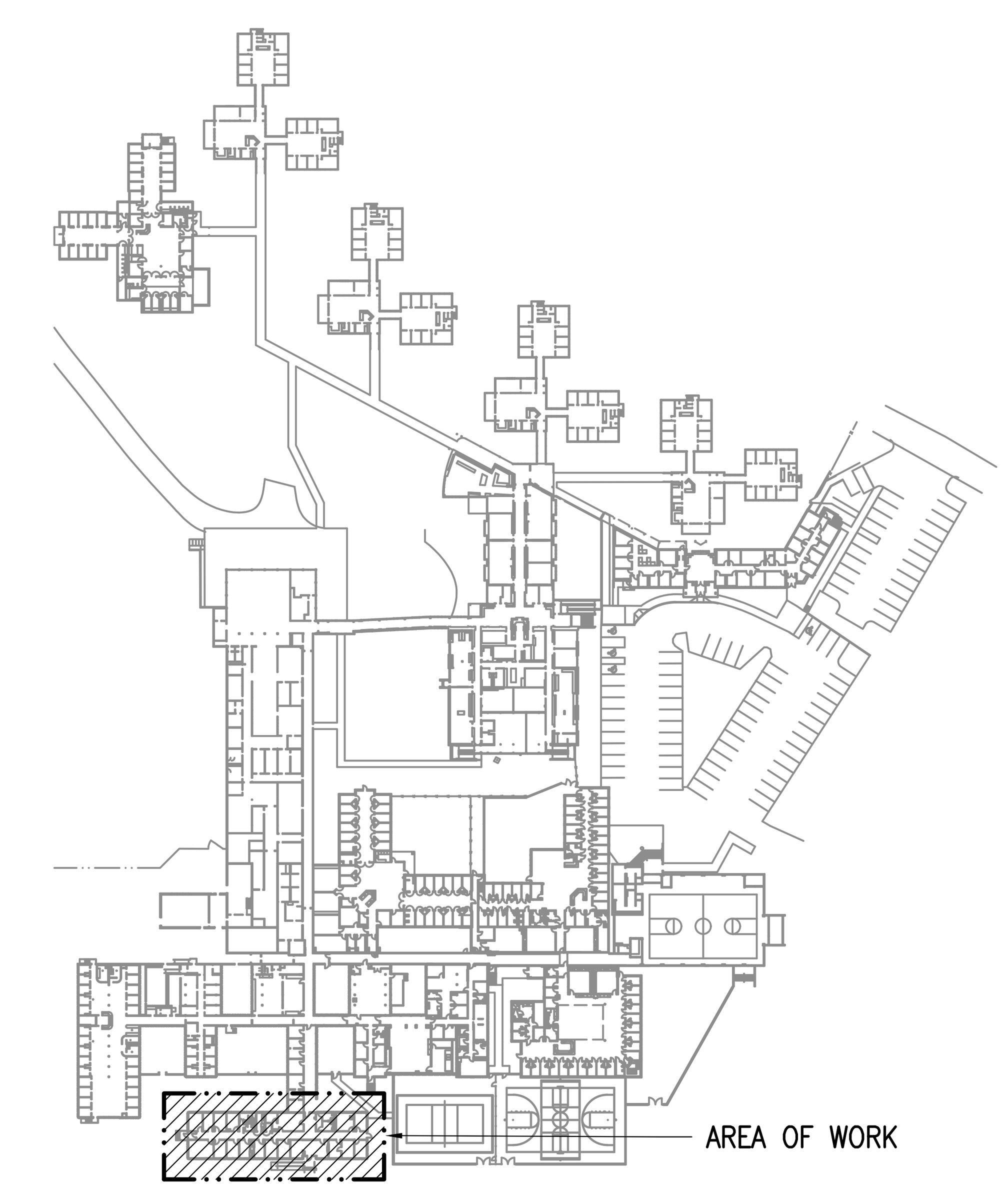
1. DEMOLISH DOMESTIC HOT WATER PUMP ALONG WITH ASSOCIATED CONDUCTORS AND CONDUIT.
2. EQUIPMENT INDICATED IS MOUNTED IN CRAWL SPACE BELOW. COORDINATE LOCATION OF EQUIPMENT WITH MECHANICAL PRIOR TO ROUGH-IN
3. REMOVE EXISTING 20A, 1P, CIRCUIT BREAKER AND INSTALL NEW 15A, 1P, CIRCUIT BREAKER IN THE EXISTING PANEL, SEE PANEL SCHEDULE ON E001.



1 ELECTRICAL DEMOLITION PLAN
3/32" = 1'-0"



2 ELECTRICAL REMODEL PLAN
3/32" = 1'-0"



KEYPLAN
NO SCALE

STATE OF ALASKA
PATRICK C. COLLINS
EE-133219
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REVISIONS:

DRAWN BY: NVF
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DATE: 09/01/2023
JOB NUMBER: M3089
DWG FILE: ESERIES

DRAWING TITLE:
ELECTRICAL DEMOLITION AND REMODEL PLAN

SHEET:
E101

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SCOPE

A. All provisions of the Contract including the General and Supplementary Conditions and the General Requirements apply to this work.

1.2 WORK INCLUDED

A. The work to be included in these and all other plumbing subsections shall consist of providing, installing, adjusting and setting into proper operation complete and workable systems for all items shown on the drawings, described in the specifications or reasonably implied. This shall include the planning and supervision to coordinate the work with other crafts and to maintain a proper time schedule for delivery of materials and installation of the work.

B. Division 01 of the specifications is to be specifically included as well as all related drawings.

1.3 RELATED WORK

1. Related Work Specified Elsewhere:

2. Electrical Specifications: Division 26.

3. Motors and Connections: Division 26.

4. Starters and Disconnects: Division 26.

B. Unless otherwise indicated on the electrical drawings or the electrical schedules, provide all plumbing equipment motors, motor starters, electrical components, wiring and any other miscellaneous Division 22 controls. Disconnect switches are included in the electrical work, unless specifically called out on mechanical plans.

C. Carefully coordinate all work with the electrical work shown and specified elsewhere.

1.4 REFERENCED CODES - LATEST ADOPTED EDITION

A. NFPA 70 National Electrical Code (NEC).

B. UPC Uniform Plumbing Code.

C. IECC International Energy Conservation Code.

D. IFC International Fire Code.

E. IBC International Building Code.

1.5 PROJECT RECORD DRAWINGS

A. In addition to other requirements of Division 01, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all mechanical work which will

become permanently concealed. Show routing of work in concealed blind spaces within the building. Show exact dimensions of buried piping off of columns or exterior walls.

B. Maintain record documents at job site in a clean, dry and legible condition. Keep record documents available for inspection by the Project Manager.

C. Show the location of all valves and their appropriate tag identification.

D. At completion of project, deliver these drawings to the Owner and obtain a written receipt.

1.6 SUBMITTALS

A. See General Conditions and the General Requirements in Division 01 regarding submittals.

B. Submit by specification section complete and all at one time; partial submittals will not be considered. Submittals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories in order of the Specification Sections. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications.

C. Catalog sheets shall be complete and the item or model to be used shall be clearly marked, and identified as to which item in the specifications or on the drawings is being submitted and with drawing fixture number where applicable.

D. Only submit on items specifically required by each specification section. If a submittal has not been requested, it will not be reviewed.

E. Submit product data for:

1. Hangers and Supports for Plumbing Piping and Equipment.

2. Vibration and Seismic controls for Plumbing Piping and Equipment.

3. Identification for Plumbing Piping and Equipment.

F. Provide shop drawings with calculations for selection of seismic restraints in accordance with IBC and ASCE 7, certified by a qualified professional engineer, licensed in the State of Alaska. Seismic calculations shall be based upon Seismic Category D. IP of 1.0 for seismic calculations.

1.7 OPERATING AND MAINTENANCE MANUALS

A. See General Conditions and the General Requirements in Division 01 regarding Operating and Maintenance Manuals.

B. Submit maintenance manuals to the Engineer covering all equipment, devices, etc. installed by the Contractor.

C. The operation and maintenance manuals shall be submitted by specification section complete and all at one time; partial operations and maintenance manual submittals will not be considered. The Operation and maintenance manuals shall be provided in electronic PDF Format. The data in the electronic file shall be arranged and indexed under basic categories. An index shall be included with bookmarks and identifying tabs between sections and references to sections of specifications. The manual shall contain, but not limited to, the following types of information:

1. Cover sheet with name, address, telephone number of Contractor, General Contractor and major equipment suppliers.

2. Catalog cuts of all equipment installed (Marked to identify the specific items used).

3. Manufacturer's maintenance and overhaul instruction booklets including exploded views.

4. Identification numbers of all parts and nearest sources for obtaining parts and services.

5. Written summary of instructions to Owner.

6. All manufacturers' warranties and guarantees.

7. Contractors Warranty Letter.

D. A periodic maintenance form that includes all of the equipment shall be provided with the maintenance manual. The form shall list each piece of equipment and how often maintenance is required (daily, weekly, monthly, annually). Opposite each task shall be squares for check-off for a full year (initials) to verify that the tasks are being done.

1.8 HANDLING

A. See General Conditions and the General Requirements in Division 01 regarding material handling.

B. Deliver packaged materials to job site in unbroken packages with manufacturer's label, and store to facilitate inspection and installation sequence. All items must be labeled and identified as to make, size and quality.

1.9 SUBSTITUTIONS

A. See General Conditions and the General Requirements in Division 01 for substitution request procedures.

B. In accordance with the General Conditions and the General Requirements in Division 01, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment. The Engineer shall be the final authority regarding acceptability of substitutes.

1.10 DIMENSIONS

A. Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings.

B. Any differences, which may be found, shall be submitted to the Engineer for consideration before proceeding with the work.

1.11 MANUFACTURER'S DIRECTIONS

A. All manufactured articles shall be applied, installed and handled as recommended by the manufacturer, unless specifically called out otherwise. Advise the Engineer of any such conflicts before installation.

1.12 PERMITS, FEES, ETC.

A. The Contractor under each Division of these specifications shall arrange for a permit from the local authority. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these specifications.

1.13 TESTING

A. The Contractor under each section shall perform the various tests as specified and required by the Architect, Engineer and as required by applicable code, the State and local authorities. The Contractor shall furnish all labor, fuel and materials necessary for making tests.

1.14 TERMINOLOGY

A. Whenever the words "furnish", "provide", "furnish and install", "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.

B. Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.

C. The use of the word "shall" conveys a mandatory condition to the contract.

D. "This section" refers to the section in which the statement occurs.

E. "The project" includes all work in progress during the construction period.

F. In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.15 SCHEDULE OF WORK

A. The work under the various sections must be expedited and close coordination will be required in executing the work. The various trades shall perform their portion of the work at such times as directed so as to meeting scheduled completion dates, and to avoid delaying any other trade. The Architect will set up completion dates. Each contractor shall cooperate in establishing these times and locations and shall process work so as to ensure the proper execution of it.

1.16 COOPERATION AND CLEANING UP

A. The Contractor for the work under each section of the specifications shall coordinate the Contractors work with the work described in all other sections of the specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on the work in such a manner that none of the work under any section of these specifications shall be handicapped, hindered or delayed at any time.

B. At all times during the progress of the work, the Contractor shall keep the premises clean and free of unnecessary materials and debris. The Contractor shall, on direction at any time from the Architect, clear any designated areas or area of materials and debris. On completion of any portion of the work, the Contractor shall remove from the premises all tools and machinery and all debris occasioned by the work, leaving the premises free of all obstructions and hindrances.

1.17 WARRANTY

A. Unless a longer warranty is hereinafter called for, all work, materials and equipment items shall be warrantied for a period of one year after acceptance by the Owner. All defects in labor and materials occurring during this period, as determined by the Engineer, shall be repaired and/or replaced to the complete satisfaction of the Engineer. Guarantee shall be in accordance with Division 01.

1.18 COMPLETION REQUIREMENTS

A. In accordance with the General Conditions and the General Requirements in Division 01, Project Closeout; before acceptance and final payment, the Contractor shall furnish:

1. Accurate project record drawings, shown in red ink on prints, showing all changes from the original plans made during installation of the work.

2. Contractors One Year Warranty.

3. All Manufacturers' Guarantees.

4. Test and Balance Reports.

5. Operation and Maintenance Manuals.

1.19 INSPECTION OF SITE - REMODEL PROJECTS

A. The accompanying plans do not indicate completely the existing plumbing and mechanical installations. The bidders for the work under these sections of the specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.

1.20 RELOCATION OF EXISTING INSTALLATIONS

A. There are portions of the existing plumbing, mechanical and electrical systems, which shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of the Contractors particular trade and that of all other trades. All such existing installations, which interfere with new installations, shall be relocated by the Contractor.

1.21 SALVAGE MATERIALS

A. The Contractor shall remove existing fixtures, equipment and other items associated with the plumbing systems where no longer required for the project. Where such items are exposed to

view or uncovered by any cutting or removal of general construction and has no continuing function as determined by the Engineer, they shall be removed.

B. All items or materials removed from the project shall be made available for the Owner's inspection. The Owner retains the option to claim any item or material. Contractor shall deliver any claimed item or material in good condition to the place designated by the Owner. All items not claimed become the property of the contractor and shall be removed from the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All equipment shall be regularly cataloged items of the manufacturer and shall be supplied as a complete unit in accordance with the manufacturer's standard specifications along with any optional items required for proper installation unless otherwise noted. Maintain manufacturer's identification, model number, etc. on all equipment at all times.

B. Where more than one of an item is to be provided, all of the items shall be identical manufacture, make, model, color, etc.

2.2 RESTRICTED MATERIALS

A. No materials containing asbestos in any form shall be allowed.

B. No solder or flux containing lead shall be used on this project.

C. Any pipe or plumbing fitting or fixture, any solder, or any flux utilized on this project shall be "lead free" in accordance with the Safe Drinking Water Act, Section 1417. "Lead free" materials utilized in domestic water system shall not contain more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.

D. Where materials or equipment provided by this Contractor are found to contain restricted materials, such items shall be removed and replaced with non-restricted materials items. Entire cost of restricted materials removal and disposal and cost of installing new items shall be the responsibility of the Contractor for those restricted materials containing items installed by the Contractor.

2.3 ELECTRICAL MOTORS

A. Motors: Furnish electric motors designed for the specific application and duty applied, and to deliver rated horsepower without exceeding temperature ratings when operated on power systems with a combined variation in voltage and frequency not more than + 10% of rated voltage. Motors for pumps and fans shall be selected to be non-overloading.

B. Verify from the drawings and specifications the available electrical supply characteristics and furnish equipment that will perform satisfactorily under the conditions shown and specified.

C. Size motors for 1.15 service factor and not to exceed 40º C temperature rise above ambient.

D. Fractional horsepower motors to have self-resetting thermal overload switch.

E. Provide NEMA Premium Efficiency, motors for all three phase motors one horsepower and larger. Standard efficiency motors will not be acceptable.

2.4 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

A. Plastic Nameplates: Laminated plastic with engraved letters.

B. Plastic Tags: Laminated plastic with engraved letters, minimum 1-1/2 inches diameter.

C. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering.

D. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.5 PIPE HANGERS AND SUPPORTS

A. Acceptable Manufacturers:

1. Anvil.
2. B-Line Systems, Inc.
3. Erico.
4. PHD Manufacturing, Inc.
5. Tolco.

B. Plumbing Piping - DWV:

1. Conform to ANSI/MSS SP58.
2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron or carbon steel, adjustable swivel, split ring.
3. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
5. Vertical Support: Steel riser clamp.
6. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
7. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with neoprene isolation pad.

C. Plumbing Piping - Water:

1. Conform to ANSI/MSS SP58.
2. Hangers for Pipe Sizes ½ to 1-½ Inch: Malleable iron or carbon steel, adjustable swivel, split ring.

3. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.

4. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.

5. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.

6. Vertical Support: Steel riser clamp.

7. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

8. Floor Support for Hot Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.

9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated with neoprene isolation pad.

10. Design hangers to allow installation without disengagement of supported pipe.

11. Copper Plating: All hanger elements in metal-to-metal contact with copper pipe, except hanger rings with factory-applied 1/16 inch minimum thick plastic or tape cushion strip over all contact surfaces.

12. Strut Type Pipe Hanging System: Unistrut P-1000 series; framing members shall be No. 12 gage formed steel channels, 1-5/8 inch square, conforming to ASTM A 570 GR33, one side of channel shall have a continuous slot with inturned lips; framing nut with grooves and spring 1/2 inch size, conforming to ASTM 675 GR60; screws conforming to ASTM A 307; fittings conforming to ASTM A 575; all parts enamel painted or electro-galvanized.

D. Shield for Insulated Piping 1-½ Inches and Smaller: 18 gauge galvanized steel shield over insulation in 180º segments, minimum 12 inches long at pipe support.

E. Shield for Insulated Piping 2 Inches and Larger: Hard block, calcium silicate insert, 180° segment, 12 inch minimum length, block thickness same as insulation thickness, flame resistant vapor barrier covering and 18 gauge galvanized shield.

2.6 HANGER RODS

A. Steel Hanger Rods: Mild steel, threaded both ends, threaded one end, or continuous threaded. Minimum Hanger Rod Sizes:

PIPE AND TUBE SIZE (INCHES)	ROD SIZE (INCHES)
¼-4	3/8
5-8	1/2
10-12	5/8

2.7 INSERTS

A. Inserts: Malleable iron case of steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.8 ANCHOR BOLTS

A. Anchor (Expansion) Bolts: Shall be carbon steel to ASTM A 307; nut shall conform to ASTM A194; shall be drilled-in type. Design values for shear and tension shall be not more than 80 percent of the allowable load.

2.9 ACCEPTABLE MANUFACTURERS: VIBRATION ISOLATORS AND SEISMIC RESTRAINT

A. Vibration isolators and Seismic Restraint shall be manufactured by:

1. Amber/Booth.

2. Cooper Industries.

3. International Seismic Application Technology.

4. Kinetics Noise Control.

5. Mason Industries.

6. Vibro-Acoustics.

7. Substitutions: Items of same function and performance are acceptable in conformance with Division 01.

2.10 SEISMIC BRACING AND SUPPORT OF SYSTEMS AND COMPONENTS

A. General:

1. Seismic restraint designer shall coordinate all attachments with the structural engineer of record.

2. Design analysis shall include calculated dead loads, static seismic loads, and capacity of materials utilized for the connection of the equipment or system to the structure.

3. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.

4. All seismic restraint devices shall be designed to accept without failure the forces calculated per the applicable building code and as summarized in installation requirements.

5. The total height of the structure (h) and the height of the system to be restrained within the structure (z) shall be determined in coordination with architectural plans and the General Contractor.

B. Friction from gravity loads shall not be considered resistance to seismic forces.

2.11 SEISMIC BRACING COMPONENTS

A. Steel strut shall be 1-5/8 inch wide in varying heights and mig-welded combinations as required to meet load capacities and designs indicated. A material heat code, part number, and manufacturer's name shall be stamped on all strut and fittings to maintain traceability to material test reports.

1. Material for epoxy painted strut: ASTM A1011, SS, Grade 33.

2. Material for pre-galvanized strut: ASTM A653, SS, Gr. 33.

3. Material for Hot-Dip Galvanized strut: ASTM A1011, SS, Grade 33 and hot-dip galvanized after fabrication in accordance with ASTM A123.

4. Material for fittings and accessories: ASTM A907 Gr. 33, Structural Quality or ASTM A1011, SS. Gr.33.

5. Fittings and accessories: Products shall be of the same manufacturer as strut and designed for use with that product.

2.12 VIBRATION ISOLATORS (ROTATING EQUIPMENT EXCEPT FANS)

A. Floor Mount: Closed spring mount with iso-stiff springs and limit stop for seismic restraint. Isolators are to be sized and selected by equipment manufacturer.

B. Provide pairs of neoprene side snubbers or restraining springs where side torque or thrust may develop.

C. Color code spring mounts, spring selected to operate at no greater than 2/3 solid deflection and have ¼" ribbed neoprene pads.

2.13 LIMITS OF VIBRATION

A. The factory is to statically and dynamically balance all rotating machinery, Do dynamic balancing at the operating speed of the motor.

B. Select isolated equipment in accordance with the weight distribution, to produce uniform deflection on the vibration mounts. Deflection of vibration mounts shall be required to produce 95% vibration isolation efficiency, based on the equipment HP, rpm, location in regard to critical spaces and stiffness of the building supporting structural members, supporting the equipment.

PART 3 - EXECUTION

3.1 DRAWINGS

A. The drawings are partly diagrammatic, not necessarily showing all offsets or exact locations of piping and ducts, unless specifically dimensioned. The contractor shall provide all materials and labor necessary for a complete and operable system. Complete details of the building which affect the mechanical installation may not be shown. For additional details, see existing arch and structural plans and Electrical Drawings. Coordinate work under this section with that of all related trades.

3.2 INSTALLATION

A. All work shall comply with the latest adopted applicable codes and ordinances including, but not limited to, the IMC, UPC, IBC, NEC, NFPA, IECC, and IFC Standards, all local and state amendments to all codes and standards.

B. Obtain and pay for all inspection fees, connection charges and permits as a part of the Contract.

C. Compliance with codes and ordinances shall be at the Contractor's expense.

3.3 MEASUREMENTS

A. Verify all measurements on the job site.

B. Check all piping, equipment, etc. to clear openings.

3.4 OPERATING INSTRUCTIONS

A. Before the facility is turned over to the Owner, instruct the Owner or Owner's personnel in the operation, care and maintenance of all systems and equipment under the jurisdiction of the Plumbing Division. These instructions shall also be included in a written summary in the Operating Maintenance Manuals.

B. The Operation and Maintenance Manuals shall be utilized for the basis of the instruction.

C. When required by individual specification sections provide additional training on plumbing systems and equipment as indicated in the respective specification section.

D. Provide schedule for training activities for review prior to start of training.

3.5 SYSTEM ADJUSTING

A. Each part of each system shall be adjusted and readjusted as necessary to ensure proper functioning of all plumbing systems. Test all plumbing equipment, fixtures and piping for proper water distribution, drainage, pressure and flow, adjust systems as required to eliminate splashing, noise and vibration.

3.6 CUTTING, FITTING, REPAIRING, PATCHING AND FINISHING

A. Arrange and pay for all cutting, fitting, repairing, patching and finishing of work by other trades where it is necessary to disturb such work to permit installation of mechanical work. Perform work only with craftsmen skilled in their respective trades.

B. Avoid cutting, insofar as possible, by setting sleeves, frames, etc. and by requesting openings in advance. Assist other trades in securing correct location and placement of rough-frames, sleeves, openings, etc. for piping.

C. Cut all holes neatly and as small as possible to admit work. Include cutting where sleeves or openings have been omitted. Perform cutting in a manner so as not to weaken walls, partitions or floors. Drill holes required to be cut in floors without breaking out around holes.

3.7 PAINTING

A. Perform all of the following painting in accordance with provisions of Division 09 with colors as selected by the Architect. Provide the following items as a part of plumbing work:

1. Factory applied prime and finish coats on plumbing equipment.

2. Factory applied prime coat on access doors.

3. Pipe identification where specified.

B. If factory finish on any equipment furnished is damaged in shipment or during construction, refinish to equal original factory finish.

3.8 IDENTIFICATION

A. Tag all valves with heat resistant laminated plastic labels or brass tags engraved with readily legible letters. Securely fasten to the valve stem or bonnet with beaded chain. Provide a framed, typewritten directory under glass, and installed where directed. Provide complete record drawings that show all valves with their appropriate label. Seton 250-BL-G, or 2961.20-G, 2" round or equal.

B. Label all equipment with heat resistant laminated plastic labels having engraved lettering ½" high. If items are not specifically listed on the schedules, consult the Engineer concerning designation to use. Seton engraved Seton-Ply nameplates or equal.

C. Identify piping to indicate contents and flow direction of each pipe exposed to view by a labeled sleeve in letters readable from floor at least once in each room and at intervals of not more that 20' apart and on each side of partition penetrations. Coloring scheme in accordance with ANSI A13.1-1981, Seton Opti-Code or equal.

3.9 PIPE HANGERS AND SUPPORTS

A. Support plumbing piping in accordance with the latest adopted edition of the UPC.

B. Support horizontal piping as follows:

MATERIALS	TYPES OF JOINTS	HORIZONTAL	VERTICAL
Copper Tube and Pipe	Soldered or Brazed	1 ½ inches and smaller, 6 feet; 2 inches and larger, 10 feet	Each floor, not to exceed 10 feet[5]
Steel and Brass Pipe for Water or DWV	Threaded or Welded	¾ inch and smaller, 10 feet; 1 inch and larger, 12 feet	Every other floor, not to exceed 25 feet[5]

Notes:

[1] Support adjacent to joint, not to exceed 18 inches.

[2] Brace not to exceed 40 foot intervals to prevent horizontal movement.

[3] Support at each horizontal branch connection.

[4] Hangers shall not be placed on the coupling.
[5] See the appropriate IAPMO Installation Standard for expansion and other special requirements.
[7] See manufacturer installation instructions for additional requirements.

C. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

D. Place a hanger within 12 inches of each horizontal elbow.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.

3.10 INSERTS

A. Provide inserts for placement in concrete formwork.

B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

D. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.11 EQUIPMENT BASES AND SUPPORTS

A. Provide equipment bases of where shown on plans and where required by equipment manufacturer installation instructions.

B. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct support of steel members. Brace and fasten with flanges bolted to structure.

D. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment anchors.

E. Provide rigid anchors for pipes after vibration isolation components are installed.

F. Anchor (Expansion) Bolts: Install anchor bolts for all plumbing piping and equipment as required. Tightly fit and clamp base-supported equipment anchor bolts at all equipment support points. Provide locknuts where piping and equipment is hung. Install anchor (expansion) bolts in holes drilled in concrete where necessary to hang piping or equipment, or to anchor stationary equipment from existing concrete slabs.

3.12 SLEEVES

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Set sleeves in position in construction. Provide reinforcing around sleeves.

C. Extend sleeves through floors one inch above finished floor level. Caulk sleeves full depth and provide floor plate.

D. Where piping penetrates floor, ceiling, or wall, install sleeve, close off space between pipe and adjacent work with fire stopping insulation and caulk seal. Use fire rated caulking where fire rated walls are penetrated. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

E. Install chrome plated steel escutcheons at finished surfaces.

3.13 SEISMIC RESTRAINT

A. General:

1. All piping and equipment shall be restrained to resist seismic forces per the applicable building code(s) as a minimum. Restraint attachments shall be made by bolts, welds or a positive fastening method. Friction shall not be considered. Additional requirements specified herein are included specifically for this project.

2. Install seismic nd wind restraint devices per the manufacturer's submittals. Any deviation from the manufacturer's instructions shall be reviewed and approved by the manufacturer.

3. Attachment to structure for suspended pipe and equipment: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

4. Wall penetrations may be used as bracing locations provided the wall can provide adequate resistance without significant damage.

5. Coordinate sizes and locations of cast-in-place inserts for post-tensioned slabs with seismic restraint manufacturer.

6. Provide hanger rod stiffeners where indicated or as required to prevent buckling of rods due to seismic forces.

7. Where rigid restraints are used on equipment or piping, support rods for the equipment or piping at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.

8. Ensure housekeeping pads have adequate space to mount equipment and seismic restraint devices and shall also be large enough to ensure adequate edge distance for restraint anchor bolts to avoid housekeeping pad breakout failure.

B. Concrete Anchor Bolts:

1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling.

2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

3. Mechanical Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.

4. Set anchors to manufacturer's recommended torque, using a torque wrench.

C. Equipment Restraints:

1. Seismically restrain equipment all equipment. Install fasteners, straps and brackets as required to secure the equipment.

D. Piping Systems:

1. For projects with a Seismic Design Category of D, E or F, provide seismic cable restraints on the following:

a. All piping systems assigned a component importance factor, Ip, of 1.5 with a nominal pipe diameter greater than 1" (25 mm) or trapeze-supported piping with combined operating weight over 10 lbs/ft (15 kg/m).

2. "12-inch rule", where pipe can be exempted from seismic restraint based on the length of the support rods, is accepted if one of the following conditions are met:

a. Hangers are detailed to avoid bending of the hangers and their attachment; and provisions are made for piping to accommodate expected deflections. The maximum stress due to combined loading including bending in the hangers must be less than 21.6 ksi.

b. Isolation hangers are added to hanger rod to provide swivel joint and to prevent bending moment in hanger.

3. Restraint spacing:

a. For ductile piping, space lateral supports a maximum of 40' (12 m) o.c., and longitudinal supports a maximum of 80' (24 m) o.c.

b. For non-ductile piping (e.g., cast iron, PVC) space lateral supports a maximum of 20' (6 m) o.c., and longitudinal supports a maximum of 40' (12 m) o.c.

4. Brace a change of direction longer than 12' (3.7 m).

5. Longitudinal restraints for single pipe supports shall be attached directly to the pipe, not to the pipe hanger.

6. For supports with multiple pipes (trapezes), secure pipes to trapeze member with clamps approved for application.

E. Install restraint cables so they do not bend across edges of adjacent equipment or building structure.

F. Install flexible metal hose loops in piping which crosses building seismic joints, sized for the anticipated amount of movement.

G. Install flexible piping connectors where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment.

H. Coordinate seismic restraints with thermal expansion compensators, guides and anchor points. Thermal expansion anchor points shall be designed to accommodate seismic forces.

3.14 SCOPE OF VIBRATION ISOLATION WORK

A. All vibrating equipment and the interconnecting pipe shall be isolated to eliminate the transmission of objectionable noise and vibration from the structure.

B. Plumbing equipment shall be carefully checked upon delivery for proper mechanical performance, which shall include proper noise and vibration operation.

C. All installed rotating equipment with excessive noise and/or vibration, which cannot be corrected in place, shall be replaced at no cost to Owner.

3.15 GENERAL PROCEDURES – VIBRATION ISOLATION

A. Select isolators in accordance with the manufacturer's recommendations and the equipment weight distribution to allow for proper static deflection of the isolators in relation to the span of the building structure supporting the equipment, considering the allowable deflection and weight of the structure.

B. Install isolators so they can be easily removed for replacement.

C. Mount all equipment absolutely level.

D. Install all isolators per manufacturer's instructions.

E. Install vibration isolators for mechanical motor driven equipment.

F. Set steel bases for 1" clearance between housekeeping pad and base.

G. All vibration isolated equipment shall be fitted with earthquake bracing and snubbers suitable for seismic control in accordance with the IBC.

H. Piping vibration isolation flexible connections shall be installed at a 90° angle to equipment deflection direction unless otherwise noted.

3.16 INSTALLATION OF EQUIPMENT

A. Unless otherwise indicated, mount all equipment and install in accordance with manufacturer's recommendations and approved submittals.

B. Maintain manufacture recommended minimum clearances for access and maintenance.

C. Where equipment is to be anchored to structure, furnish and locate necessary anchoring and vibration isolation devices.

D. Furnish all structural steel, such as angles, channels, beams, etc. required to support all piping, equipment and accessories installed under this Division. Use structural supports suitable for

equipment specified or as indicated. In all cases, support design will be based upon data contained in manufacturer's catalog.

E. Openings: Arrange for necessary openings in buildings to allow for admittance and reasonable maintenance or replacement of all equipment furnished under this Contract.

F. Access Doors: Provide as necessary for reasonable maintenance of all equipment valves, controls, etc.

END OF SECTION

SECTION 22 05 19 - METERS AND GAUGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Pressure Gauges and Pressure Gauge Taps.

B. Thermometers and Thermometer Wells.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Section 22 10 00 - Plumbing Piping: Installation of thermometer wells, pressure gauge tappings.

1.3 REFERENCES

A. ASTM E1 - Specification for ASTM Thermometers.

B. ASTM E77 - Verification and Calibration of Liquid-in-Glass Thermometers.

1.4 SUBMITTALS

A. Submit under provisions of Division 01.

B. Product Data: Include list which indicates use, operating range, total range and location for manufactured components.

C. Submit manufacturer's installation instructions under provisions of Division 01.

1.5 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Division 01.

B. Accurately record actual locations of instrumentation.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install instrumentation when areas are under construction, except for required rough-in, taps, supports and test plugs.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Trerice.

B. Marsh.

C. Ashcroft.

D. Enerpac.

E. Sisco.

F. Petersen.

G. Weiss.

H. Winters.

I. Substitutions: In accordance with Division 01.

2.2 PRESSURE GAUGES

A. 3-1/2 inch diameter cast aluminum case, phosphor bronze bourdon tube, rotary bronze movement, brass socket, with silicone fluid dampening black figures on white background, one percent mid-scale accuracy, scale calibrated in psi. Model 600CB as manufactured by Trerice.

2.3 PRESSURE GAUGE TAPS

A. Gauge Isolation Valve: Lever handle ball valve, forged brass body, chrome plated brass ball, viton o-rings for maximum 150 psig. Model Mini T-82-M as manufactured by Jomar or approved equal.

B. Needle Valve: Brass for maximum 150 psig. Model 735 as manufactured by Trerice or approved equal.

C. Pulsation Damper: Pressure snubber, brass with 1/4 inch connections. Series 870 as manufactured by Trerice or approved equal.

2.4 STEM TYPE THERMOMETERS

A. 9 inch scale, universal adjustable angle, blue organic spirit fill, lens front tube, cast aluminum case with blue epoxy finish and clear acrylic window, extended brass stem, cast aluminum adjustable joint with positive locking device, 2 percent of scale accuracy to ASTM E77, scale calibrated in both degrees F and degrees C. BX9 series as manufactured by Trerice.

2.5 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stems with or without extensions as required.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install thermometers in piping systems in sockets in short couplings Enlarge pipes smaller than 2-1/2 inch for installation of thermometer sockets. Select bulb length to reach centerline of pipe.

C. Install thermometer sockets adjacent to controls system thermostat, transmitter, or sensor sockets.

D. Provide instruments with scale ranges selected according to service with largest appropriate scale.

E. Install gauges and thermometers in locations where they are easily read from normal operating level.

3.2 PRESSURE GAUGE SCHEDULE

LOCATION	SCALE RANGE
Pumps less than 40' TDH	0 - 30 PSIG
Domestic Water System	0 - 100 PSIG
Others	As applicable

3.3 STEM TYPE THERMOMETER SCHEDULE

LOCATION	SCALE RANGE
Domestic Cold water system	0 - 100°F
Domestic Hot Water Supply and Recirc.	0 - 200°F
Others	As applicable

END OF SECTION

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Piping Insulation.

B. Equipment Insulation.

C. Jackets and Accessories.

1.2 RELATED WORK

A. Section 22 05 00 - Common Work Results for Plumbing.

B. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

C. Section 22 05 53 - Identification for Plumbing Piping and Equipment.

D. Section 22 10 00 - Plumbing Piping.

1.3 REFERENCES

A. ASTM B209 - Aluminum and Aluminum-alloy Sheet and Plate.

B. ANSI/ASTM C533 - Calcium Silicate Block and Pipe Thermal Insulation.

C. ANSI/ASTM C534 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

D. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.

E. ANSI/ASTM C547 - Mineral Fiber Preformed Pipe Insulation.

F. ANSI/ASTM C552 - Cellular Glass Block and Pipe Thermal Insulation.

G. ANSI/ASTM C553 - Mineral Fiber Blanket and Felt Insulation.

H. ANSI/ASTM C578 - Preformed, Block Type Cellular Polystyrene Thermal Insulation.

I. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).

J. ANSI/ASTM C612 - Mineral Fiber Block and Board Thermal Insulation.

K. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.

L. ASTM C1427 - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.

M. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Tim of Burning of Plastics in a Horizontal Position.

N. ASTM E84 - Surface Burning Characteristics of Building Materials.

O. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

P. NFPA 255 - Surface Burning Characteristics of Building Materials.

Q. UL 723 - Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Include product description, thickness for each service, and locations.

C. Submit manufacturer's installation instructions.

1.5 QUALITY ASSURANCE

A. Applicator: Company specializing in piping insulation application with three years minimum experience.

B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.

C. Materials: Flame spread/smoke developed rating of 25/50 in accordance with UL 723, ASTM E84, or NFPA 255.

D. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

1.6 DELIVERY STORAGE AND HANDLING

A. Division 01 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Shipment of materials from manufacturer to installation location shall be in weather tight transportation.

D. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

1.8 FIELD MEASURMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Division 01 - Execution and Closeout Requirements: Product warranties and product bonds.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Armacell.

B. Certain-Teed.

C. IMCOA.

D. Johns Manville.

E. Knauf.

F. Owens-Corning.

G. Manson.

H. Nomaco.

I. Pittsburgh - Corning.

J. K-Flex USA.

K. Armstrong.

L. TRUEBRO.

M. Substitutions: Under provisions of Division 01.

2.2 INSULATION - PIPING

A. Type A: Glass fiber, rigid, molded, non-combustible insulation; ANSI/ASTM C547; 'k' value of 0.23 at 75º F, rated from 0º F to 850º F, vapor retarder jacket of Kraft paper bonded to aluminum foil, self-sealing lap and butt strips; Johns Manville "Micro-Lok" or approved equal.

B. Type C: Expanded polystyrene; ANSI/ASTM C578; rigid closed cell; maximum water vapor transmission rating of 0.1 perms; 'k' value of 0.23 at 75º F.

C. Type D: Flexible unicellular polyolefin; ASTM C1427; 'k' value of 0.25 at 75º F ASTM C518; moisture vapor transmission of zero perm-inch ASTM E96; rated to 210º F; IMCOA “Imcolock” or approved equal.

D. Type E: Elastomeric foam; EPDM-based closed-cell flexible foam, ASTM C534; flexible cellular elastomeric in sheet or pre-formed tube, ’k’ value of 0.26 at 75º F, max. service temp - 300º F, ASTM C534; max. flame spread = 50, max. smoke developed = 50, ASTM E84; UV-resistant coating/jacketing if exposed to sunlight; K-FLEX USA “Insul-Tube”, “Insul-Sheet”, or approved equal.

2.3 INSULATION - EQUIPMENT

A. Type H: Rigid fiberglass board with FSK outer facing. Foil-Scrim-Kraft (FSK) facing of aluminum foil reinforced with fiberglass yarn and laminated with fire-resistant adhesive to kraft paper, 3.0 lbs./cu. ft. density, ASTM C612, 'k' value of 0.23 at 75º F, 450º F maximum service temperature; Johns Manville 814"Spin-Glas" Removable Blankets or approved equal.

2.4 FIELD APPLIED JACKET

A. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.

B. PVC Jackets and solvent welding adhesive: One piece, pre-molded type, Johns Manville "Zeston 2000", fitting covers and jacketing material. Johns Manville "Perma-Weld" solvent welding adhesive.

C. Aluminum Jackets: ASTM B209; 0.016 inch thick; corrugated or textured finish, longitudinal slip joints.

D. Stainless Steel Jackets: Type 304 stainless steel; 0.010 inch thick; corrugated finish.

E. Re-Wettable Canvas Jacketing: , Fiberglass cloth made from texturized yarns, impregnated throughout with an inorganic fire retardant asbestos free adhesive; 20x14 thread count, 14.5 oz./sq.yd, 0.04 inch thickness, 1,000º F upper temperature limit; GLT Products "Style 1989" or approved equal.

2.5 INSULATION ACCESSORIES

A. Adhesives: Waterproof and fire-retardant type.

B. Canvas Lagging Adhesive: Fire resistive to NFPA 255.

C. Impale Anchors: Galvanized steel, 12 gauge, self-adhesive pad.

D. Joint Tape: Glass fiber cloth, open mesh.

E. FSK Joint Tape; ASTM C1136 Foil-Scrim-Kraft (FSK) lamination coated with solvent acrylic pressure sensitive adhesive; capable of adhering to fibrous and sheet metal surfaces; tri-directionally reinforced 2x3 squares per inch fiberglass scrim; 9.5 mils thick, -40 to 240º F service temperatures; Venture Tape "1525CW" or approved equal.

F. Tie Wire: Annealed steel, 16 gauge.

G. Insulated pipe supports: Calcium silicate with galvanized steel jacket (min. 24 gauge); ANSI/ASTM C533; rigid white; 'k' value of 0.37 at 100º F, rated to 1,200º F; Thermal Pipe Shields "T-1000 Calsil" or equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install materials after piping and equipment has been tested and approved.

B. Clean surfaces for adhesives.

C. Prepare surfaces in accordance with manufacturer's recommendations.

3.2 INSTALLATION - PIPING

A. Install materials in accordance with manufacturer's recommendations, building codes and industry standards.

B. Continue insulation vapor barrier through penetrations except where prohibited by code.

C. Locate insulation and cover seams in least visible locations.

D. Neatly finish insulation at supports, protrusions, and interruptions.

E. Provide insulated cold pipes conveying fluids below ambient temperature with vapor retardant jackets with self-sealing laps. Insulate complete system, including under fitting jackets.

F. For insulated pipes conveying fluids above ambient temperature, secure jackets with self-sealing lap or outward clinched, expanded staples. Bevel and seal ends of insulation at equipment, flanges, and unions. Insulate complete system, including under fitting jackets.

G. Provide insulated piping supports on piping 1-½" inches diameter to 3" diameter for insulated piping supports. Insulated piping supports shall not be less than the following lengths:

1-½" to 2-½" pipe size 10" long

H. Jackets:

1. For pipe exposed in mechanical equipment rooms or in finished spaces below 10 feet above finished floor, finish with PVC jacket and fitting covers or metal jacket.

3.3 SCHEDULE – PIPING

PIPING	TYPE	PIPE SIZE Inch	MINIMUM INSULATION THICKNESS Inch
Domestic Cold Water	A, C, D , E	All Sizes	1"
Domestic Hot Water – Smaller then 1-1/2"	A, C, D, E	All Sizes	1"
Domestic Hot Water – 1-1/2" and Larger	A, C, D, E	All Sizes	1-1/2"
Domestic Hot Water Recirculated – Smaller then 1-1/2"	A, C, D, E	All Sizes	1"

3.4 INSTALLATION - EQUIPMENT

A. Install materials in accordance with manufacturer's instructions.

B. Do not insulate factory insulated equipment.

C. Apply insulation as close as possible to equipment by grooving, scoring, and beveling insulation, if necessary. Secure insulation to equipment with studs, pins, clips, adhesive, wires, or bands. Minimum 2" overlap on blanket material.

D. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.

E. Do not insulate over nameplate or ASME stamps. Bevel and seal insulation around such.

F. When equipment with insulation requires periodical opening for maintenance, repair, or cleaning, install insulation in such a manner that it can be easily removed and replaced without damage.

G. Where canvas jacketing is indicated, apply mastic in sufficient thickness to completely cover the texture of the canvas material.

3.5 SCHEDULE - EQUIPMENT

EQUIPMENT	INSULATION TYPE	THICKNESS INCH
Domestic Hot Water Filters	H	2"
Domestic Cold Water Filters	H	1"

END OF SECTION

SECTION 22 10 00 - PLUMBING PIPING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Water Piping.

B. Valves.

C. Dielectric Connections.

1.2 RELATED WORK

A. Section 22 05 00 - Common Work Results for Plumbing.

B. Section 22 05 16 - Expansion Fittings and Loops for Plumbing Piping.

C. Section 22 05 19 - Meters and Gages for Plumbing Piping.

D. Section 22 05 29 - Hangers and Supports for Plumbing Piping and Equipment.

E. Section 22 05 53 - Identification for Plumbing Piping and Equipment.

F. Section 22 07 00 - Plumbing Insulation.

G. Section 22 30 00 - Plumbing Equipment.

1.3 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Any pipe or plumbing fitting or fixture, any solder, or any flux utilized on this project shall be “lead free” in accordance with the Safe Drinking Water Act, Section 1417. “Lead free” materials utilized in domestic water system shall not contain more than 0.2 percent lead when used with respect to solder and flux; and not more than a weighted average of 0.25 percent lead when used with respect to the wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.

C. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

D. Welders Certification: In accordance with ANSI/ASME Sec 9.

1.4 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Include data on pipe materials, pipe fittings, valves and accessories.

1.5 WARRANTY

A. Polypropylene pipe and fittings shall be covered by a factory warranty for 30 years to be free of defects in materials or manufacturing.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 01.

B. Store and protect products under provisions of Division 01.

C. Deliver and store valves in shipping containers with labeling in place.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type L, hard drawn. Fittings: ASME B16.18, cast copper alloy, or ASME B16.22, wrought copper. Joints: ANSI/ASTM B32, solder, Grade 95TA; Flux: ASTM B813 or Press-Fit.

B. PEX Tubing: Tubing shall be cross-linked high-density polyethylene. Tubing shall be produced using silane method of cross-linking and shall meet the dimension and performance specifications of ASTM F876/F877 and CSA B137.5. Tubing shall also comply with ANSI/NSF 61 as suitable for use with potable water. Temperature and pressure ratings shall be 160 psi at 73 degrees F, 100 psi at 180 degrees F, and 80 psi at 200 degrees F.

2.2 FLANGES, UNIONS, AND COUPLINGS

A. Pipe Size 2 Inches and Under: 150 psig malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.

B. Pipe Size Over 2 Inches: 150 psig forged steel slip-on flanges for ferrous piping; bronze flanges for copper piping: 1/16 inch thick preformed neoprene bonded to fiber.

C. Grooved and Shouldered Pipe End Couplings: Malleable iron housing clamps to engage and lock, designed to permit some angular deflection, contraction, and expansion; "C" shape composition sealing gasket; steel bolts, nuts, and washers; galvanized couplings for galvanized pipe.

2.3 ACCEPTABLE MANUFACTURERS - DIELECTRIC CONNECTIONS

A. Elster Perfection - Clearflow.

B. Substitutions: Under provisions of Division 01.

2.4 DIELECTRIC CONNECTIONS

A. Dielectric Connections: Dielectric waterway fitting shall have zinc electroplated steel casing with polypropylene inner lining to provide a dielectric waterway. The fitting shall be designed to meet requirements of ASTM F1545 for continuous use at temperatures up to 225°F and for pressures up to 300 psi. IAPMO, UPC and NSF-61 listed for use with potable water.

2.5 ACCEPTABLE MANUFACTURERS - ALL VALVE TYPES

A. Apollo.

B. FNW.

C. Hammond.

D. Milwaukee.

E. NIBCO.

F. Red-White Valve Corp.

G. Substitutions: Under provisions of Division 01.

2.6 GATE VALVES

A. Not permitted. Use ball or butterfly valves for isolation service.

2.7 GLOBE VALVES

A. Not permitted. Use ball or butterfly valves for throttling service.

2.8 BALL VALVES

A. Up to 2 Inches: 600 PSI CWP Lead free bronze two piece body, full port, forged lead free brass ball, Teflon seats and adjustable packing, lever handle, solder, threaded or press-fit ends.

B. Over 2 Inches: Cast steel, two piece body, full port chrome plated steel ball, Teflon seat and stuffing box seals, lever handle, flanged, solder, threaded or press-fit ends.

2.9 BUTTERFLY VALVES

A. Over 2 Inches: 200 PSI CWP Ductile iron body, aluminum bronze disc, EPDM seat for service to 180º F, lug ends 10 position lever handle.

2.10 SWING CHECK VALVES

A. Up to 2 Inches: 200 PSI CWP lead free bronze swing with PTFE disc, solder, screwed or press-fit ends.

B. Over 2 Inches: 285 PSI CWP ductile iron body, stainless steel trim, swing disc, renewable disc and seat, flanged ends.

2.11 SPRING LOADED CHECK VALVES

A. Up to 2 inches: 250 PSI CWP Lead free bronze spring loaded with PTFE seat, solder, screwed or press fit ends.

B. Over 2 inches: 200 PSI CWP Cast iron body, bronze trim, spring loaded, renewable composition disc, wafer, flanged ends.

2.12 PRESSURE RELIEF VALVES

A. Bronze body, Teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled, NPT ends.

2.13 BALANCE VALVE

A. Straight pattern, calibrated balance valve for 400 psig maximum working pressure, with NSF 61 compliant lead free brass body, type 304 stainless steel ball, glass and carbon filled TFE seat rings, brass and EPT check valves, EPDM stem o-ring, plastic wheel handle for shut-off service, and lockshield key cap with set screw memory bonnet for balancing service. NPT or sweat ends. Bell & Gossett Circuit Setter Plus, NIBCO PC/T/S-1805-LF or approved equal.

2.14 DRAIN VALVES

A. Bronze body, chrome plated brass ball, RPTFE seals and stuffing box ring, stainless steel handle with vinyl cover. 3/4” NPT x 3/4” Hose thread, with duct cover and chain, sweat ends. Apollo 78-100 Series or approved equal.

PART 3 - EXECUTION

3.1 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.

3.2 INSTALLATION

A. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

B. Route piping in orderly manner and maintain gradient.

C. Install piping to conserve building space and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

F. Provide clearance for installation of insulation and access to valves and fittings.

G. Provide access where valves and fittings are not exposed. Coordinate size and location of access doors.

H. Slope water piping and arrange to drain at low points.

I. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

J. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting. Refer to Division 09.

K. Establish invert elevations, slopes for drainage to 1/4” per foot, 1/8” per foot if 4" or over, minimum. Maintain gradients.

L. Install valves with stems upright or horizontal, not inverted.

M. Provide properly sized handles for valve operation. Handles shall not be cut or bent to make fit where installed.

N. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with Teflon™ based thread lubricate. Ensure clearance at cleanout for rodding of drainage system.

3.3 APPLICATION

A. Install unions downstream of valves and at equipment connections.

B. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.

C. Install ball or balance valve valves for throttling, bypass, or manual flow control services. (No globe valves permitted.)

D. Provide spring loaded check valves on discharge of water pumps.

3.4 TESTING

A. Test all water piping in accordance with Section 609 of the UPC. Submit a signed statement to the Engineer stating testing dates, procedure and initials of tester. The test pressure for a hydrostatic test shall be 1.5 times the design pressure or 150 psi, whichever is greater, and for an air test shall be 1.1 times the design pressure or 150 psi, whichever is greater.

3.5 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Flush, clean and disinfect the potable water system in accordance with Section 609 of the UPC. Submit a signed statement to the Engineer stating disinfection dates, procedure and initials of tester.

END OF SECTION

SECTION 22 30 00 - PLUMBING EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Pumps.

B. Filters.

1.2 RELATED WORK

A. Section 22 05 00 - Common Work Results for Plumbing.

B. Section 22 05 19 - Meters and Gages for Plumbing Piping.

C. Section 22 07 00 - Plumbing Insulation.

D. Section 22 10 00 - Plumbing Piping.

1.3 QUALITY ASSURANCE

A. Provide pumps with manufacturer's name, model number, and rating/capacity identified.

B. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. National Sanitation Foundation (NSF).

2. National Electrical Manufacturers' Association (NEMA).

3. Underwriters Laboratories (UL).

C. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, operate within 25 percent of midpoint of published maximum efficiency curve.

1.4 REGULATORY REQUIREMENTS

A. Conform to NSF, NFPA 70 requirements for water heaters.

B. All materials utilized in domestic water system shall be certified by an ANSI accredited organization to conform to ANSI/NSF Standard 61.

1.5 SUBMITTALS

A. Submit product data under provisions of Division 01.

B. Include filter and cartridge dimensions, and performance data.

C. Indicate pump type, capacity, materials of construction, power requirements, and affected adjacent construction.

D. Submit certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.

E. Submit manufacturer's installation instructions under provisions of Division 01.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Division 01.

B. Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Division 01.

B. Store and protect products under provisions of Division 01.

1.8 WARRANTY

A. Provide manufacturer's warranty under provisions of Division 01.

PART 2 - PRODUCTS

A. ACCEPTABLE MANUFACTURERS - IN-LINE CIRCULATOR PUMPS

B. Grundfos.

C. Wilo.

D. Taco.

E. Substitutions: Under provisions of Division 01.

2.2 IN-LINE CIRCULATOR PUMPS

A. Casing: Bronze, rated for 125 psig working pressure.

B. Impeller: Bronze.

C. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.

D. Seal: Carbon rotating against a stationary ceramic seat.

E. Drive: Flexible coupling.

2.3 FILTERS

A. Housing: 304 or 316L stainless steel, rated up to 140 F, Brass wing nuts, EPDM Rim Gaskets, ¼” inlet and outlet sample ports, Rated up to 150 PSI.

B. Cartridge: 50 – 100 micron, NSF 61 Listed, Low pressure drop, Cleanable and Reusable.

2.4 PUMP INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Provide line sized ball valve and strainer on suction and line sized soft seated check valve and globe valve on discharge.

END OF SECTION

SECTION 23 09 93 - SEQUENCE OF OPERATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Domestic Hot Water Circulation Pumps.

1.2 RELATED SECTIONS

A. Section 22 30 00 – Plumbing Equipment.

1.3 SYSTEM DESCRIPTION

A. Existing Direct Digital Controls system is by Johnson Controls (sole source contractor). All controls work as required to accomplish the sequence of operations, all controls, wiring and associated components shall be designed, provided, and installed by Johnson Controls.

B. This Section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other Sections.

1.4 SUBMITTALS

A. Submit under provisions of Division 01.

B. Submit diagrams indicating mechanical system controlled and control system components. Label with settings, adjustable range of control and limits. Include written description of control sequence.

1.5 PROJECT RECORD DOCUMENTS

A. Submit documents under provisions of Division 01.

B. Accurately record actual setpoints and settings of controls, including changes to sequences made after submission of shop drawings.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 DOMESTIC HW CIRCULATING PUMPS HWCP-1

A. Alarms:

1. No flow.

B. Manual Control and Indication:

1. HWCP on-off Control.

C. Automated Control:

1. The pump shall operate continuously.

END OF SECTION

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. General Requirements specifically applicable to Division 26.

B. The electrical system equipment and installation shall comply with all provisions and requirements of this specification, as well as any and all applicable national, state and local codes and standards.

1.2 COORDINATION

A. Coordinate the Work specified in this Division.

B. Prepare drawings showing proposed rearrangement of Work to meet job conditions, including changes to Work specified under other Sections. Obtain permission of Architect prior to proceeding.

1.3 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code, latest adopted edition including all state and local amendments.

B. NECA - Standard of Installation.

C. Electrical Reference Symbols: The Electrical "Legend" on drawings is standardized version for this project. All symbols shown may not be used on drawings. Use legend as reference for symbols used on plans.

D. Electrical Drawings: Drawings are diagrammatic; complimentary to the Architectural drawings; not intended to show all features of work. Install material not dimensioned on drawings in a manner to provide a symmetrical appearance. Do not scale drawings for exact equipment locations. Review Mechanical Drawings and adjust work to conform to conditions shown thereon. Field verification of dimensions, locations and levels is directed.

1.4 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 70.

B. Conform to the latest adopted edition of the International Building Code and the International Fire Code including all state and local amendments thereto.

C. Obtain electrical permits, plan review, and inspections from authority having jurisdiction.

1.5 SUBMITTALS

A. Submittal review is for general design and arrangement only and does not relieve the Contractor from any requirements of Contract Documents. Submittal not checked for quantity, dimension, fit or proper operation. Where deviations of substitute product or system performance have not been specifically noted in the submittal by the Contractor, provisions of a complete and satisfactory working installation are the sole responsibility of the Contractor.

B. The following is required for work provided under this division of the specification.

1. Provide material and equipment submittals containing complete listings of material and equipment shown on Electrical Drawings and specified herein. Separate from work furnished under other divisions.

2. Submittals shall be provided in PDF format with each section indexed in the PDF document. Submittals for Division 26 shall be complete and submitted at one time. Unless given prior approval, partial submittals will be returned unreviewed.

3. Clearly identify all material and equipment by item, name or designation used on drawings and in specifications.

4. Submit only pages which are pertinent; mark catalog sheets to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring diagrams and controls; component parts; finishes; dimensions; and required clearances.

5. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.

6. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.

7. Coordinate submittals with requirements of work and of Contract Documents.

8. Certify in writing that the submitted shop drawings and product data are in compliance with requirements of Contract Documents. Notify Engineer in writing at time of submittal, of any deviations from requirements of Contract Documents.

9. Do not fabricate products or begin work which requires submittals until return of submittal with Engineer acceptance.

10. Equipment scheduled by manufacturer's name and catalog designations, manufacturer's published data and/or specification for that item, in effect on bid date, are considered part of this specification. Approval of other manufacturer's item proposed is contingent upon compliance therewith.

1.6 SUBSTITUTIONS

A. In accordance with the General Conditions and the General Requirements, Substitution and Product Options, all substitute items must fit in the available space, and be of equal or better quality including efficiency performance, size, and weight, and must be compatible with existing equipment.

1.7 PROJECT RECORD DRAWINGS

A. In addition to the other requirements, mark up a clean set of drawings as the work progresses to show the dimensioned location and routing of all electrical work which will become permanently concealed. Show routing of work in permanently concealed blind spaces within the building. Show complete routing and sizing of any significant revisions to the systems shown.

B. Record drawing field mark-ups shall be maintained on-site and shall be available for examination of the Owner's Representative at all times.

1.8 DEMONSTRATION OF ELECTRICAL SYSTEMS

A. During substantial completion inspection:

1. Demonstrate installation to operate satisfactorily in accordance with requirements of Contract Documents.

2. Should any portion of installation fail to meet requirements of Contract Documents, repair or replace items failing to meet requirements until items can be demonstrated to comply.

3. Have instruments available for measuring light intensities, voltage and current values, and for demonstration of continuity, grounds, or open circuit conditions.

4. Provide personnel to assist in taking measurements and making tests.

1.9 WARRANTY

A. Warrant all materials, installation and workmanship for one (1) year from date of acceptance.

B. Copies of manufacturer product warranties for all equipment shall be included in the operation and installation manuals.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All Materials and Equipment shall be new.

B. All Materials and Equipment shall be listed by Underwriter's Laboratories or equivalent third party listing agency for the use intended.

C. Materials and Equipment shall be acceptable to the authority having jurisdiction as suitable for the use intended when installed per listing and labeling instructions.

D. No materials or equipment containing asbestos in any form shall be used. Where materials or equipment provided by this Contractor are found to contain asbestos such items shall be removed and replaced with non-asbestos containing materials and equipment at no cost to the Owner.

E. In describing the various items of equipment, in general, each item will be described singularly, even though there may be numerous similar items.

PART 3 - EXECUTION

3.1 WORKMANSHIP

A. Install Work using procedures defined in NECA Standard of Installation and/or the manufacturer's installation instructions.

3.2 TESTS

A. Notify the Owner's representative at least 72 hours prior to conducting any tests.

B. Following completion of installation, test system ground in accordance with the requirements of NETA ATS 7.13. and all feeders in accordance with NETA ATS 7.3. Submit logs of values obtained, and nameplate data of instruments used prior to final inspection. Include a copy of all data in the power distribution section of the Operation and Maintenance Manuals.

C. Perform additional tests required under other sections of these specifications.

D. Perform all tests in the presence of the Owner's representative.

END OF SECTION

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical Demolition.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition Drawings are based on a non-destructive walkthrough and existing record documents. Report discrepancies to Owner before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove abandoned wiring to source of supply.

B. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

C. Maintain access to existing electrical installations which remain active.

D. Extend existing installations using materials and methods as specified.

E. Where materials or equipment are to be turned over to Owner or reused and installed by the Contractor, it shall be the Contractor’s responsibility to maintain condition of materials and equipment equal to the existing condition of the equipment before the work began. Repair or replace damaged materials or equipment at no additional cost to the Owner.

3.4 EXISTING PANELBOARDS

A. Ring out circuits in existing panel affected by the Work. Where additional circuits are needed, reuse circuits available for reuse.

B. Tag unused circuits as spare.

C. Where existing circuits are indicated to be reused, use sensing measuring devices to verify circuits feeding Project area or are not in use.

D. Remove existing wire no longer in use from panel to equipment.

E. Provide new updated directories where more than three circuits have been modified or rewired.

3.5 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions.

3.6 DISPOSAL

A. Dispose of all hazardous waste in accordance with all local, State and Federal requirements.

END OF SECTION

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building Wire.

B. Cable.

C. Wiring Connections and Terminations.

1.2 RELATED SECTIONS

A. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

A. ANSI/NEMA WC 70-2021 – Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy.

B. NETA ATS – Acceptance testing specifications for Electrical Power Distribution and Systems.

C. NFPA 262 – Standard Method of test for flame travel and smoke of wires and cables for use in air-handling spaces.

D. UL 83 – Thermoplastic Insulated Wire and Cable.

E. UL 1063 – Standard for Machine and Tool Wire and Cable.

F. UL 1569 – Standard for Metal Clad Cable.

G. UL 1581 – Reference Standard for Electrical Wires, Cables and Flexible Cords.

1.4 SUBMITTALS

A. Submittals are not requested for this section.

1.5 QUALITY ASSURANCE

A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5m) when tested in accordance with NFPA 262.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Thermoplastic-insulated Building Wire: NEMA WC 70.

B. Feeders and Branch Circuits 6 AWG and Smaller: Copper conductor, 600 volt insulation, THHN/THWN or XHHW-2. 6 and 8 AWG, stranded conductor; smaller than 8 AWG, solid or stranded conductor.

C. Branch Circuit Wire Color Code:

1. Color code wires by line or phase as follows:

a. Black, red, blue and white for 120/208V systems.

2. For conductors 6 AWG and smaller, insulation shall be colored.

3. Grounding conductors 6 AWG and smaller shall have green colored insulation.

2.2 WIRING CONNECTIONS AND TERMINATIONS

A. For conductors 8 AWG and smaller:

1. Dry interior areas: Spring wire connectors, pre-insulated “twist-on” rated 105 degrees C per UL 468C. Where stranded conductors are terminated on screw type terminals, install crimp insulated fork or ring terminals. Thomas & Betts Sta-Kon or equal.

2. Motor connections: Spring wire connectors, pre-insulated “twist-on” rated 105 degrees C per UL 468C. Provide a minimum of 8 wraps of Scotch 33+ electrical tape around conductors and connector to eliminate connector back off.

PART 3 - EXECUTION

3.1 GENERAL WIRING METHODS

A. Use no wire smaller than 12 AWG for power circuits.

B. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet.

C. Splice only in junction or outlet boxes.

D. Neatly train and lace wiring inside boxes, equipment, and panelboards.

E. Make Conductor lengths for parallel circuits equal.

F. Wiring in lighting fixture channels shall be rated for 90º C minimum.

G. Do not share neutral conductors. Provide a dedicated neutral conductor for each branch circuit that requires a neutral.

3.2 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Verify that raceway is complete and properly supported prior to pulling conductors. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Do not install XHHW-2 conductors when ambient temperatures are below 23F and THHN/THWN conductors when ambient temperatures are below 32F.

D. Conductors shall be carefully inspected for insulation defects and protected from damage as they are installed in the raceway. Where the insulation is defective or damaged, the cable section shall be repaired or replaced at the discretion of the Owner and at no additional cost to the Owner.

E. Place an equal number of conductors for each phase of a circuit in same raceway or cable.

F. Route conductors from each system in independent raceway system and not intermix in the same raceway, enclosure, junction box, wireway, or gutter as another system unless otherwise shown on the plans.

G. No more than six current carrying conductors shall be installed in any homerun unless otherwise indicated on the drawings or without prior approval from the Engineer.

H. Completely and thoroughly swab raceway system before installing conductors.

I. When two or more neutrals are installed in one conduit, identify each with the proper circuit number in accordance with Section 26 05 53.

3.3 CABLE INSTALLATION

A. Provide protection for exposed cables where subject to damage.

B. Use suitable cable fittings and connectors.

3.4 WIRING CONNECTIONS AND TERMINATIONS

A. Stranded wire shall not be wrapped around screw terminals.

B. Splice only in accessible junction boxes.

C. Thoroughly clean wires before installing lugs and connectors.

D. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

E. Terminate spare conductors with twist on connectors or heat shrink insulation to proper voltage rating.

F. Do not exceed manufacturer's recommended pull tensions.

3.5 FIELD QUALITY CONTROL

A. Inspect wire and cable for physical damage and proper connection.

B. Torque conductor connections and terminations to manufacturer's recommended values.

3.6 WIRE AND CABLE INSTALLATION SCHEDULE

A. All Locations: Building wire and/or remote control and signal cable in raceways.

END OF SECTION

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical Equipment and Raceway Grounding and Bonding.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and sections under Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

1.3 REFERENCE STANDARDS

A. IEEE Std 81 – Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.

B. UL 467 – Standard for Grounding and Bonding Equipment.

1.4 SUBMITTALS

A. Product Data: Submit product data for all components provided, showing material type and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

1.5 CLOSEOUT SUBMITTALS

A. Closeout submittals are not requested for this section.

1.6 COORDINATION

A. Complete grounding and bonding of building reinforcing steel prior to concrete placement.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Bonding Conductors: Solid bare copper wire for sizes No. 8 AWG and smaller diameter. Conductors may be insulated conductors if used provide green insulation.

B. Grounding Conductors: Copper conductor bare or green insulated.

C. Mechanical Grounding and Bonding Connectors: Non-reversible crimp type lugs only. Use factory made compression lug for all terminations.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide a separate, insulated equipment-grounding conductor in all branch circuits. Terminate each end on a grounding lug, bus, or bushing. Multiple conductors on single lug not permitted. Each grounding conductor shall terminate on its own terminal lug.

B. Grounding conductors for branch circuits shall be sized in accordance with NEC, except minimum size grounding conductor shall be No. 12 AWG.

C. Grounding conductor is in addition to neutral conductor and in no case shall neutral conductor serve as grounding means.

3.2 FIELD QUALITY CONTROL

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Section included hangers and supports for Power Systems.

B. Conduit Supports.

C. Equipment Bases and Supports.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and Section 26 05 00 – Common Work Results for Electrical.

1.3 REFERENCES

A. International Building Code (IBC), Chapter 16 – Structural Design.

1.4 SUBMITTALS

A. Product Data: Submit product data for specialty supports.

1.5 QUALITY ASSURANCE

A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

PART 2 - PRODUCTS

2.1 CONDUIT SUPPORTS

A. Manufacturers:

1. Allied Tube & Conduit Corp.

2. Minerallac Fastening Systems.

3. O-Z Gedney Co.

4. Substitutions: per Division 01

B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

E. Conduit clamps - general purpose: One-hole malleable iron for surface mounted conduits.

F. Cable Ties: High strength nylon temperature rated to 185 degrees F. self-locking.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, preset inserts, beam clamps, or spring steel clips.

B. Use toggle bolts or hollow wall fasteners in hollow masonry partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.

C. Do not support raceways, low voltage pathways, cables, telecommunication pathways or boxes from ceiling suspension wires or suspended ceiling systems. Provide support from building structure independently to allow ceiling removal and replacement without removal of electrical system. If dedicated support wires are used, wires and wire clips must be painted or color-coded.

D. Do not fasten supports to piping, ductwork, mechanical equipment, conduit, or ceiling suspension system.

E. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

F. Securely fasten fixtures and equipment to building structure in accordance with manufacturer's recommendations and to provide necessary earthquake anchorage.

G. Earthquake Anchorages:

1. Equipment weighing more than 50 pounds shall be adequately anchored to the building structure to resist lateral earthquake forces.

2. Total lateral (earthquake) forces shall be 1.5 times the equipment weight acting laterally in any direction through the equipment center of gravity. Provide adequate backing at structural attachment points to accept the forces involved.

END OF SECTION

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Metal Conduit.

B. Flexible Metal Conduit.

C. Fittings and Conduit Bodies.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

C. Section 26 05 26 – Grounding and Bonding for Electrical Systems.

D. Section 26 05 29 – Hangers and Supports for Electrical Systems.

E. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated..

B. American Society for Testing and Materials (ASTM):

1. ASTM A 123 – Specification for Zinc Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.

C. National Electrical Manufacturers Association (NEMA):

1. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

2. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

3. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

D. Underwriters Laboratory (UL):

1. UL 6 - Rigid Steel Conduit, Zinc Coated.

2. UL 514B – Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

E. National Fire Protection Association (NFPA):

1. NFPA 70 - National Electrical Code.

F. International Building Code (IBC):

1. IBC chapters 16 and 17 seismic requirements.

1.4 RACEWAY AND BOX INSTALLATION SCHEDULE

A. Exposed Dry Locations:

1. Raceway: Provide rigid steel conduit or intermediate metal conduit. EMT conduit may be used where exposed conduit is allowed, where it is not subject to physical damage or, where installed on the ceiling or a minimum of ten feet above the floor.

2. Boxes and Enclosures: Provide sheet-metal boxes with raised steel covers.

3. Fittings: Provide galvanized malleable iron and steel.

B. Equipment Connections: Provide short extensions (three feet maximum) of flexible metal conduit for connections to motors, vibrating equipment or equipment that requires removal for maintenance or replacement. Use Liquidtight flexible conduit and fittings for motors and equipment in damp or wet locations or subject to spilling of liquids as at pumps, etc.

1.5 DESIGN REQUIREMENTS

A. Raceway Minimum Size:

1. Above Grade or Slab on Grade: Provide 1/2 inch minimum, unless otherwise noted. Raceway may be reduced to ½ inch for final connection of raceway up to 6 feet for connection to fixture or device where maximum conduit entry size is ½ inch.

2. Line Voltage Circuits: Raceway is sized on the drawings for copper conductors with 600-Volt type XHHW insulation, unless otherwise noted. Where a raceway size is not shown on the drawings, it shall be calculated to not exceed the percentage fill specified in the NEC Table 1, Chapter 9 using the conduit dimensions of the NEC Table 4, Chapter 9 and conductor properties of the NEC Table 5, Chapter 9.

B. Box Minimum Size: Provide all boxes sized and configured per NEC Article 370 and as specified in this section.

C. Seismic Support: Provide support in accordance with section 26 05 29 – Hangers and Supports for Electrical Systems.

1.6 SUBMITTALS

A. Product Data: Submit data for products to be provided.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

PART 2 - PRODUCTS

2.1 RIGID METAL CONDUIT (RMC)

A. Rigid Steel Conduit: ANSI C80.1, UL 6.

B. Fittings and Conduit Bodies: NEMA FB 1, UL 514B; Galvanized malleable iron with threaded hubs for all conduit entries. Provide threaded connections and couplings only. Set Screw and running thread fittings are not permitted.

C. Provide insulated throat bushings at all conduit terminations.

2.2 EXPANSION FITTINGS

A. Galvanized malleable iron, galvanized with grounding bond jumper.

2.3 BUSHINGS

A. Non-grounding: Threaded impact resistant plastic.

B. Grounding: Insulated galvanized malleable iron/steel with hardened screw bond to raceway and conductor lug.

2.4 LOCKNUTS

A. Threaded Electro Zinc Plated Steel designed to cut through protective coatings for ground continuity.

2.5 WIREWAY

A. Product Description: General purpose type wireway. Size per NEC minimum fill capacity required.

B. Knockouts: Field-installed, no factory knockouts acceptable.

C. Cover: Screw cover.

D. Fittings and Accessories: Include factory couplings, offsets, elbows, adapters and support straps required for a complete system. Provide internal ground bonding jumper bonded to each section.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26.

B. Provide seismic support and fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

C. Identify raceway and boxes with origin and destination in accordance with Section 26 05 53.

D. Unless otherwise noted, do not inter-mix conductors from separate panelboards or any other system in the same raceway system or junction boxes.

3.2 INSTALLATION - GENERAL RACEWAY

A. Install raceway for all systems, unless otherwise noted.

B. Install an equipment grounding conductor inside of all raceways containing line voltage conductors.

C. Provide raceways concealed in construction unless specifically noted otherwise, or where installed at surface cabinets, motor and equipment connections and in Mechanical and Electrical Equipment rooms. Do not route conduits on roofs, outside of exterior walls, or along the surface of interior finished walls unless specifically noted on the plans.

D. Raceway routing and boxes are shown in approximate locations unless dimensioned. Where raceway routing is not denoted, field-coordinate to provide complete wiring system.

E. Do not route raceways on floor. Arrange raceway and boxes to maintain a minimum of 6 feet 6 inches of headroom and present a neat appearance. Install raceways level and square to a tolerance of 1/8” per 10 feet. Route exposed raceways and raceways above accessible ceilings parallel and perpendicular to walls, ceiling, and adjacent piping.

F. Maintain minimum 6-inch clearance between raceway and mechanical and piping and ductwork. Maintain 12-inch clearance between raceway and heat sources such as flues, steam pipes, heating pipes, heating appliances, and other surfaces with temperatures exceeding 104 degrees F.

G. Do not install raceway imbedded in spray applied fire proofing. Seal raceway penetrations of fire-rated walls, ceilings, floors in accordance with the requirements of Section 26 05 00 and Division 07.

H. Conduit embedded in concrete or solid masonry shall not be larger than 1/3 the thickness of the wall or slab and shall be spaced not less than three diameters apart. No cutting of reinforcing bars shall be permitted unless specifically approved. Should structural members prevent the installation of conduit or equipment, notify the Contracting Officer before proceeding.

I. Arrange raceway supports to prevent misalignment during wiring installation. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

J. Do not attach raceway to ceiling support wires or other piping systems and do not fasten raceway with wire or perforated pipe straps. Remove all wire used for temporary raceway support during construction, before conductors are pulled. Raceway shall be installed to permit ready removal of equipment, piping, ductwork, or ceiling tiles.

K. Group raceway in parallel runs where practical and use conduit rack constructed of steel channel with conduit straps or clamps, as specified in Section 26 05 29. Provide space on each rack for 25 percent additional raceway.

L. Cut conduit square; de-burr cut ends. Bring conduit to the shoulder of fittings and couplings and fasten securely. Where locknuts are used, install with one inside box and one outside with dished part against box.

M. Install no more than the equivalent of three 90-degree bends between boxes.

N. Install conduit bodies to make sharp changes in direction, such as around beams. “Goosenecks” in conduits are not acceptable.

O. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch size.

P. Provide protective plastic bushings or insulated throat bushings at each raceway termination not installed to an enclosure. Bushings shall be threaded to the raceway end or connector.

Q. Install fittings and flexible metal conduit to accommodate 3-axis movements where raceway crosses seismic joints.

R. Install fittings designed and listed to accommodate expansion and contraction where raceway crosses control and expansion joints.

S. Stub a minimum of 2 inches above floor all raceways terminated beneath free standing service equipment, pad mounted equipment, etc.

T. Paint all exposed conduit to match surface to which it is attached or crosses. Clean greasy or dirty conduit prior to painting in accordance with paint manufacturer's instructions. Where raceway penetrates non-rated ceilings, floors or walls, provide patching, paint and trim to retain architectural aesthetics similar to surroundings.

3.3 INSTALLATION – GENERAL BOXES

A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance. All electrical box locations shown on Drawings are approximate unless dimensioned.

B. Provide knockout closures for unused openings.

C. Do not fasten boxes to ceiling support wires or other piping systems.

D. Support boxes independently of conduit.

E. Clean interior of boxes to remove dust, debris, and other material and clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Tape Labels.

B. Wire and Cable Markers.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables.

C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

D. Section 26 24 16 – Panelboards.

1.3 SUBMITTALS

A. Section 26 05 00 – Common Work Results for Electrical.

B. Product Data:

1. Submit manufacturer's catalog literature for each product required.

2. Submit electrical identification schedule including list of wording, symbols, letter size, color-coding, tag number, location, and function.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Install labels and nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.

PART 2 - PRODUCTS

2.1 TAPE LABELS

A. Product Description: Adhesive tape labels, with 3/16 inch Bold Black letters on clear background made using Dymo Rhino series label printer or approved equal.

B. Embossed adhesive tape will not be permitted for any application.

2.2 WIRE AND CABLE MARKERS

A. Power and Lighting Description: Machine printed heat-shrink tubing, cloth or wrap-on type, for all neutrals and Phase conductors.

B. Low Voltage System Description: Self-adhesive machine printed label with unique wire number that is shown on shop drawing for system.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Degrease and clean surfaces to receive nameplates and tape labels.

B. Install nameplates and tape labels parallel to equipment lines.

3.2 WIRE IDENTIFICATION

A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identification shall be as follows:

1. Markers shall be located within one inch of each cable end, except at panelboards, where markers for branch circuit conductors shall be visible without removing panel deadfront.

2. Each wire and cable shall carry the same labeled designation over its entire run, regardless of intermediate terminations.

3. Color code phases, neutral, and ground per NEC requirements and Section 26 05 19.

4. Color-code all low-voltage system wires and cables in accordance with the individual sections in which they are specified.

5. For power circuits, identify with branch circuit or feeder number.

B. Provide pull string markers at each end of all pull strings. Marker shall identify the location of the opposite end of the pull string.

3.3 JUNCTION BOX IDENTIFICATION

A. Label each power junction box with the panelboard name and circuit number.

END OF SECTION

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Branch Circuit Panelboards.

1.2 RELATED SECTIONS

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, Supplementary Conditions, and Section 26 05 00 – Common Work Results for Electrical.

B. Section 26 05 26 – Grounding and Bonding for Electrical Systems.

C. Section 26 05 53 – Identification for Electrical Systems.

D. Section 26 29 16 – Enclosed Contactors.

1.3 REFERENCES

A. NEMA AB 1 - Molded Case Circuit Breakers.

B. NEMA KS 1 - Enclosed Switches.

C. NEMA PB 1 - Panelboards.

D. UL 67 – Panelboards.

E. UL 98 - Enclosed and Dead-front Switches.

F. UL 489 – Molded Case Circuit Breakers and Circuit Breaker Enclosures.

G. Federal Specification W-C-375B/Gen – Circuit Breakers, Molded Case, Branch Circuit and Service.

1.4 SUBMITTALS

A. Submit data under provisions of Section 26 05 00.

B. Product Data: Submit product data for all components provided which fall under this section showing configurations, finishes, and dimensions. Each catalog sheet should be clearly marked to indicate exact part number provided, including all options and accessories.

C. Shop drawings: Submit shop drawings for each panelboard indicating features and device arrangement and size. Include outline and support point dimensions, voltage, main bus ampacity, and integrated short circuit ampere rating.

1.5 CLOSEOUT SUBMITTALS

A. Project Record Drawings: Submit final record panel schedules as hardcopy and in Microsoft Excel format. Submit under Section 26 05 00.

B. Operation and Maintenance Manuals: Provide product data and shop drawing information including replacement parts list. Provide installation, operation and maintenance information per manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

A. Upon arrival at the site inspect equipment and report on any damage.

B. Handle carefully on site to avoid any damage to internal components, enclosures and finishes.

C. Store in a clean, dry environment. Maintain factory packaging and provide an additional heavy canvas or plastic cover to protect enclosures from dirt, water, construction debris and traffic.

1.7 WARRANTY

A. Manufacturer shall warrant specified equipment to be free of defects for a period of one year from the date of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS - PANELBOARDS

A. Square D.

B. Cutler Hammer.

C. General Electric.

D. Siemens.

2.2 PANELBOARD IDENTIFICATION

A. For each existing panelboard where circuits are added or modified, provide typed schedule denoting each circuit load by the load type and final name and room number. Schedule shall not be typed with names shown on the Contract Drawings unless names are acceptable to the Owner.

B. Provide panel schedule for every existing panelboard where circuits are added or modified.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide filler plates for unused spaces in panelboards.

B. Panel Schedules: Revise schedules to reflect circuiting changes required to balance phase loads.

3.2 FIELD QUALITY CONTROL

A. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers.

END OF SECTION

SECTION 26 29 13 - ENCLOSED CONTROLLERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Manual Motor Starters.

1.2 RELATED SECTIONS

A. Division 22 – Plumbing.

B. Section 26 05 29 – Hangers and Supports for Electrical Systems.

C. Section 26 05 53 – Identification for Electrical Systems.

1.3 REFERENCES

A. The Work under this section is subject to requirements of the Contract Documents including the General Conditions, and Supplementary Conditions.

B. NEMA AB 1 - Molded Case Circuit Breakers.

1.4 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division 01.

B. Provide product data on motor starters and overcurrent protective devices.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Include recommended maintenance procedures and intervals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - MOTOR STARTERS

A. Square D.

B. Allen Bradley.

C. Siemens.

D. Cutler Hammer.

E. Substitutions: Under provisions of Division 01.

2.2 MANUAL MOTOR STARTERS

A. Fractional Horsepower Manual Starter: NEMA ICS 2; AC general-purpose Class A manually operated, number of poles as required by the load served, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and toggle operator.

B. Enclosure: ANSI/NEMA ICS 6; Type 1, 3R or 4. As indicated on the Drawings.

2.3 CONTROLLER OVERCURRENT PROTECTION AND DISCONNECTING MEANS

A. Molded Case Thermal-Magnetic Circuit Breakers: NEMA AB 1; circuit breakers with integral thermal and instantaneous magnetic trip in each pole.

B. Motor Circuit Protector: NEMA AB 1; circuit breakers with integral instantaneous magnetic trip in each pole.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install motor control equipment in accordance with manufacturer's instructions.

B. Motor Data: Provide neatly typed label inside each motor starter enclosure door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

C. After final connections are made, check and correct the rotation of all motors.

D. Field adjust the trip settings of all motor starter magnetic trip only circuit breakers to approximately 11 times motor full load current. Determine full load current from motor nameplate following installation.

E. Motor starting equipment shall be listed for use with the motors specified under Division 22.

END OF SECTION