



Ferndale School District #502

Date: July 5th, 2022

Project: FSD Building Controls Standardization Project

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**FERNDALE SCHOOL DISTRICT # 502
BUILDING CONTROLS STANDARDIZATION PROJECT
REQUEST FOR PROPOSAL**

1. **INTRODUCTION:** The Ferndale School District is requesting proposals for the Building Controls Standardization Project at the below-listed school bldgs.:
- 1.1 Cascadia Elementary School, 6175 Church Road, Ferndale WA 98248
 - 1.2 Central Elementary School, 5610 Second Ave., Ferndale WA 98248
 - 1.3 Horizon Middle School, 2671 Thornton Road, Ferndale WA 98248
 - 1.4 Alternate #1: Vista Middle School, 6051 Vista Drive, Ferndale WA 98248
- Consideration will only be given to proposals received no later than **11 AM on July 21, 2022**. All proposals received will be opened and publicly read at the Ferndale School District Office. Sealed proposals may be mailed, or hand-delivered in-person to Ferndale School District, Attention: Mark Deebach or Tammy Longstaff, 6041 Vista Drive (hand-delivered), PO Box 698 (mailed), Ferndale, WA 98248. Proposals received after the above-stated closing date and time cannot be considered and will be returned unopened.
2. **STATUTE:** This RFP is pursuant to RCW39.04.270. Electronic data processing and telecommunications systems, acquisition method, competitive negotiation, findings, intent.
3. **PROPOSAL EVALUATION FACTORS:**
A contract shall be awarded to the contractor with the highest-scoring proposal based on the following proposal evaluation factors and potential scores:

	<u>Evaluation Factor Description</u>	<u>Potential Score Value</u>
3.1	Provide, install & maintain for a 1 yr. period the Ferndale School District Standard Building Management System. <u>Basis of Design:</u> Tridium Niagara N4 Framework, JACE N4 System Controllers, and Distech field devices. Alternate but Equivalent systems may be proposed for evaluation by the school district.	20
3.2	Experience either manufacturing and/or being the authorized representative for the primary DDC systems components specified above in Section 3.1.	15
3.3	Experience providing, installing & maintaining School Building Management Systems to School Districts.	10
3.4	Service Proposal: 3.4.a Response time for service calls. 3.4.b Hourly Rates 3.4.c Software Update Provisions 3.4.d Annual Contract: 3.4.d.1 Is an annual contract available? 3.4.d.2 Is an annual contract required? 3.4.d.3 Cost of annual contract.	20
3.5	Contractor's previous project references.	10
3.6	Warranty Period: A one-year warranty is required. Points will be awarded based on the proposed length of warranty beyond the one-year requirement.	10

The proposal with the longest time frame will be awarded 10 points. Proposals with the minimum will be awarded 0 points. Proposals with timeframes extended beyond the minimum but less than the longest proposed timeframe will be awarded points on a percentage basis between the minimum and the longest proposed timeframes.

3.7 Proposed Cost **15**

Total Possible Base Score 100

3.8 Interviews: At the discretion of the Ferndale School District, interviews with the top 2 scoring proposers may be requested. If interviews are conducted, up to an additional 20 points will be added to each of the proposer's total base score.

- 4. SCHEDULE:** All four projects will commence no later than **01/01/2023** and complete no later than **05/31/2023**. Phasing and sequence TBD post-award. The schools involved with this project will be fully occupied during the project. The contractor is required to coordinate any classroom activities with district staff and occur outside of normal school operating hours but within the normal workday in the late afternoon.
- 5. PRE-PROPOSAL WALKTHROUGH:** There will be an optional pre-proposal walk-through of each facility at **10 AM on 07/12/2022** starting at Central Elementary School, 5610 Second Ave., Ferndale WA 98248. Questions will be either answered at that time or via follow-up emails. All contractors who have expressed an interest in the project will be provided with questions/answers from the walk-through regardless of attendance status.
- 6. EXAMINATION OF SPECIFICATIONS:** Proposers shall thoroughly examine and be familiar with the attached specifications. The failure or omission of a proposer to receive or examine any form, instruments, addendum, or other document or to visit the site when required to acquaint oneself with existing conditions, shall in no way relieve any proposer from obligations with respect to this proposal or any other resulting contracts. Contractors must consider all existing conditions prior to submitting a proposal. No change orders will be accepted for existing conditions. The submission of a proposal shall be taken as prima facie evidence of compliance with this section.
- 7. PAYMENT & PERFORMANCE BOND:** Within ten (10) working days of the contract award, the successful contractor shall provide a 100% payment & performance bond.
- 8. PUBLIC WORKS:** Pursuant to RCW 39.12.020, prevailing wages must be paid on this public works job. Five percent (5%) retainage will be withheld pending receipt of all WA State approvals.

The following approved documents must be on file with the Ferndale School District **prior** to any payments being released on this public works project.

8.1 Statement of Intent to Pay Prevailing Wages

8.2 Certificate of Insurance.

Applicable prevailing wages are to be determined as of the proposal due date and are available at: <https://lni.wa.gov/licensing-permits/public-works-projects/prevailing-wage-rates/>

Ferndale School District No. 502**Building Controls Standardization Project Bid Form****Proposal Due Date: 07/21/2022 by 11 AM**

Contractor's Name:	
Project Manager:	
Email:	
Phone #:	

Evaluation Factors Included in Proposal:	YES	No
3.1 Building Management System Basis of Design		
3.2 Experience with Building Management System DDC Components		
3.3 Experience with School District Building Management Systems		
3.4 Service Proposal		
3.5 Contractor References		
3.6 Warranty Period		
3.7 Proposed Cost		

Cost Proposal Per Facility:	Amount
Cascadia Elementary School Cost	
Central Elementary School Cost	
Horizon Middle School Cost	
Alternate #1: Vista Middle School Cost	
Base Contract Total	
Alternate #1 Total	
Project Grand Total	

Project Managers Signature:	Date:

Ferndale School District - HVAC Controls Replacement Requirements

1 SCOPE

- 1.1** Furnish all labor, materials and equipment necessary for a complete and operating Building Management System (BMS), utilizing Direct Digital Controls as described herein.
- 1.2** The intent of this specification is to provide a BMS system that is consistent throughout the Ferndale School district facilities.
- 1.3** System architecture shall provide secure Web access using any of the current versions of Microsoft Internet Explorer, Mozilla Firefox, or Google Chrome browsers from any computer on the owner's LAN.
- 1.4** All control devices furnished shall be programmable directly from the Niagara 4 Workbench embedded toolset upon completion of this project. The use of configurable or programmable controllers that require additional software tools or tools that require a specific Niagara 4 license brand to operate for post-installation maintenance shall not be acceptable.
- 1.5** All control devices controlling heating water systems, air handlers, fan coil units, rooftop units, or classroom unit ventilators shall include an integral LCD with hand-off-auto (HOA) control.
- 1.6** Any control vendor that shall provide additional BMS server software shall be unacceptable. Only systems that utilize the Niagara 4 Framework shall satisfy the requirements of this section.
- 1.7** The BMS Niagara N4 supervisor server shall host all graphic files and trend data for the control system.
- 1.8** All products of the BMS shall be provided with the following agency approvals. Verification that the approvals exist for all submitted products shall be provided on request, with the submittal package. Systems or products not currently offering the following approvals are not acceptable.
 - a. UL 504 - Industrial Control Equipment.
 - b. UL 506 - Specialty Transformers.
 - c. UL 916 - Energy Management Systems All.
 - d. IEEE C62.41- Surge Voltages in Low-Voltage AC Power Circuits.
 - e. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
 - f. NEMA 250 - Enclosures for Electrical Equipment.
 - g. NEMA ICS 1 - Industrial Controls and Systems.

2 SUBMITTALS

- 2.1** Product Data: Manufacturer's data sheets on each product to be used, including:
 - a. Preparation instructions and recommendations.
 - b. Storage and handling requirements and recommendations.
 - c. Installation methods.
- 2.2** Shop drawings of the entire control system shall be submitted and shall consist of a complete list of equipment and materials, including manufacturers' catalog data sheets and installation instructions. Submit in printed electronic format. Samples of written Controller

Checkout Sheets and Performance Verification Procedures for applications similar in scope shall be included for approval.

- 2.3** Shop drawings shall also contain complete wiring and schematic diagrams, sequences of operation, control system bus layout and any other details required to demonstrate that the system has been coordinated and will properly function as a system. Terminal identification for all control wiring shall be shown on the shop drawings.
- 2.4** Upon completion of the work, provide complete set of 'as-built' drawings and other project-specific documentation on Flash media.
- 2.5** Any deviations from these specifications or the work indicated on the drawings shall be clearly identified in the Submittals.

3 QUALITY ASSURANCE

- 3.1** The Control System Contractor shall have a full service DDC office within 50 miles of the job site.
- 3.2** Single Source Responsibility of Supplier: The Control System Contractor shall be responsible for the complete installation and proper operation of the control system. The Control System Contractor shall exclusively be in the regular and customary business of design, installation, and service of computerized building management systems similar in size and complexity to the system specified. The Control System Contractor shall be the manufacturer of the primary DDC system components or shall have been the authorized representative for the primary DDC components manufacturer for at least 5 years.
- 3.3** Equipment and Materials: Equipment and materials shall be cataloged products of manufacturers regularly engaged in the production and installation of HVAC control systems. Products shall be manufacturer's latest standard design and have been tested and proven in actual use.

4 PRE-INSTALLATION MEETINGS

- 4.1** Convene minimum two weeks prior to starting work of this section.

5 DELIVERY, STORAGE AND HANDLING

- 5.1** Maintain integrity of shipping cartons for each piece of equipment and control device through shipping, storage and handling as required to prevent equipment damage. Store equipment and materials inside and protected from weather.

6 JOB CONDITIONS

- 6.1** Coordinate the work with Ferndale School District to insure that the work will be carried out in an orderly fashion. It shall be this contractor's responsibility to check the contract documents for possible conflicts between their work and the school district in equipment location, pipe, duct and conduit runs, electrical outlets and fixtures, air diffusers and structural and architectural features.

7 SEQUENCING

- 7.1** Installation shall be coordinated with the Ferndale School District. Work to be done in phases during occupied and unoccupied school hours to provide minimal interruption to the

operation of existing HVAC control systems. Any interruptions to normal school operations will be coordinated with the school district.

8 PRODUCTS

8.1 MANUFACTURERS

- a. Distech programmable controls with Tridium Niagara Framework version
- b. Programmable equipment controllers with LCD display and HOA control
- c. Substitutions: Not permitted.

8.2 GENERAL

- a. The Building Management System (BMS) shall be comprised of a network of interoperable, stand-alone digital controllers, at least one network area controller per building site, graphics and programming and other control devices for a complete system as specified herein.
- b. The installed system shall provide secure strong password access to all features, functions and data contained in the overall BMS.

8.3 BUILDING AUTOMATION SERVER HARDWARE (BAS)

- a. Minimum Computer Configuration (Hardware Independent).
 - 8.3.a.1. Central Server. Owner shall provide a dedicated BAS server with configuration that includes the following components as a minimum:
 - 8.3.a.2. Processor: Intel Xeon CPU E5-2640 x64 (or better), compatible with dual- and quad-core processors.
 - 8.3.a.3. Memory: 2 GB or more recommended for large systems, 8 GB or more recommended for the Windows 64-bit version.
 - 8.3.a.4. Hard Drive: 4 GB minimum, more recommended depending on archiving requirements.
 - 8.3.a.5. Display: Video card and monitor capable of displaying 1024 x 768 pixel resolution or greater.
 - 8.3.a.6. Network Support: Ethernet adapter (10/100 Mb with RJ-45 connector).
 - 8.3.a.7. Connectivity: Full-time high-speed ISP connection recommended for remote site access (i.e. T1, ADSL, cable modem).
 - 8.3.a.8. Standard Client: The thin-client Web Browser BAS GUI shall be Microsoft Internet Explorer (10.0 or later) running on Microsoft 7+. No special software shall be required to be installed on the PCs used to access the BAS via a web browser.

8.4 DIGITAL ROOM SENSOR

- 8.5** General: The Digital Room Sensors shall provide the following types of functions:
 - a. Space temperature measurements and indications
 - b. Occupancy and CO₂, user setpoint adjustments where applicable.
 - c. Interface to Controller: The Digital Room Sensor shall connect directly to the controller. The Digital Room Sensor shall be able to be located up to 150' from the controller.

8.6 OTHER CONTROL SYSTEM HARDWARE

- a. Pipe and Duct Temperature sensing elements: Type III 10,000 ohm thermistor encapsulated temperature sensors with an accuracy of ± 0.36 Degrees F (± 0.20 Degrees C). Their range shall be -4 to 221 degrees F (-20 to 105 degrees C).
- b. Any existing control equipment that is inoperable to be replaced with equal or better like-in-kind equipment.
- c. Existing Control wiring can be re-used if serviceable and adequate for new control system.

8.7 HVAC EQUIPMENT

- a. Replacement of existing HVAC equipment specified herein shall be completed by the qualified Control contractor or a qualified HVAC subcontractor.

9 BAS SERVER & WEB BROWSER GUI - SYSTEM OVERVIEW

- 9.1** The BAS Contractor shall provide system software based on server/thin-client architecture, designed around the open standards of web technology. The BAS server shall communicate using Ethernet and TCP. Server shall be accessed using a web browser over Owner intranet and remotely over the Internet.
- 9.2** The intent of the thin-client architecture is to provide the operator(s) complete access to the BAS system via a web browser. The thin-client web browser Graphical User Interface (GUI) shall be browser and operating system agnostic, meaning it will support HTML5 enabled browsers without requiring proprietary operator interface and configuration programs or browser plug-ins. Microsoft, Firefox, and Chrome browsers (current released versions), and Windows as well as non-Windows operating systems.
- 9.3** The BAS server software shall support at least the following server platforms (Windows 8.1, 10, Server 12). The BAS server software shall be developed and tested by the manufacturer of the system stand-alone controllers and network controllers/routers.
- 9.4** The web browser GUI shall provide a completely interactive user interface and shall provide a HTML5 experience that supports the following features as a minimum:
 - a. Trending.
 - b. Scheduling.
 - c. Electrical demand limiting.
 - d. Duty Cycling.
 - e. Downloading Memory to field devices.
 - f. Real time 'live' Graphic Programs.
 - g. Set point adjustments.
 - h. Alarm / event information.
 - i. Execution of global commands.
- 9.5** Software Components: All software shall be the most current version. All software components of the BAS system software shall be provided and installed as part of this project. BAS software components shall include:
 - a. Server Software, Database and Web Browser Graphical User Interface.

- b. 18 Month Software Maintenance license. Labor to implement not included.
 - c. Embedded System Configuration Utilities for future modifications to the system and controllers.
 - d. Embedded Graphical Programming Tools.
 - e. Embedded Direct Digital Control software.
 - f. Embedded Application Software.
- 9.6** BAS Server Database: The BAS server software shall utilize a Java Database Connectivity (JDBC) compatible database such as: MS SQL 8.0, Oracle 8i or IBM DB2. BAS systems written to Non-Standard and/or Proprietary databases are NOT acceptable.
- 9.7** Thin Client - Web Browser Based: The GUI shall be thin client or browser based and shall meet the following criteria:
- a. Web Browser's for PC's: Only the current released browser (Explorer/Firefox/Chrome) will be required as the GUI and a valid connection to the server network. No installation of any custom software shall be required on the operator's GUI workstation/client. Connection shall be over an intranet or the Internet.
 - b. Secure Socket Layers: Communication between the Web Browser GUI and BAS server shall offer encryption using 128-bit encryption technology within Secure Socket Layers (SSL). Communication protocol shall be Hyper-Text Transfer Protocol (HTTP).

10 WEB BROWSER GRAPHICAL USER INTERFACE

- 10.1** Web Browser Navigation: The Thin Client web browser GUI shall provide a comprehensive user interface. Using a collection of web pages, it shall be constructed to "feel" like a single application and provide a complete and intuitive mouse/menu driven operator interface. It shall be possible to navigate through the system using a web browser to accomplish requirements of this specification. The Web Browser GUI shall (as a minimum) provide for navigation, and for display of animated graphics, schedules, alarms/events, live graphic programs, active graphic set point controls, reports, and reporting actions for events.
- 10.2** Login: On launching the web browser and selecting the appropriate domain name or IP address, the operator shall be presented with a login page that will require a login name and strong password. Navigation in the system shall be dependent on the operator's role-based application control privileges.
- 10.3** Navigation: Navigation through the GUI shall be accomplished from the Action Pane by selecting dynamic links to other system graphics.
- a. Action Pane: The Action Pane shall provide several functional views for each subsystem specified. A functional view shall be accessed by clicking on the corresponding button:
 - 10.3.a.1. Graphics: Using graphical format suitable for display in a web browser, graphics shall include aerial building/campus views, color building floor plans, equipment drawings, active graphic set point controls, web content and other valid HTML elements. The data on each graphic page shall automatically refresh.
 - 10.3.a.2. Dashboards: User customizable data using drag and drop HTML5 elements. Shall include Web Charts, Gauges, and other custom developed

widgets for web browser. User shall have ability to save custom dashboards.

- 10.3.a.3. Properties: Shall include graphic controls and text for the following: Locking or overriding objects, demand strategies, and any other valid data required for setup. Changes made to the properties pages shall require the operator to depress an 'accept/cancel' button.
- 10.3.a.4. Schedules: Shall be used to create, modify/edit and view schedules based on the systems hierarchy (using the navigation tree).
- 10.3.a.5. Alarms: Shall be used to view alarm information geographically (using the navigation tree), acknowledge alarms, sort alarms by category, actions and verify reporting actions.
- 10.3.a.6. Charting: Shall be used to display associated trend and historical data, modify colors, date range, axis and scaling. User shall have ability to create HTML charts through web browser without utilizing chart builder. User shall be able to drag and drop single or multiple data points, including schedules, and apply status colors for analysis.
- 10.3.a.7. Logic - Live Graphic Programs: Shall be used to display 'live' graphic programs of the control algorithm, (micro block programming) for the mechanical/electrical system selected in the navigation tree.
- 10.3.a.8. Other actions such as Print, Help, Command, and Logout shall be available via a drop-down window.

10.4 Color Graphics: The Web Browser GUI shall make use of color in the graphic pane to communicate information related to set points and comfort. Animated .gifs or .jpg, vector scalable, active set point graphic controls shall be used to enhance usability. Graphics tools used to create Web Browser graphics shall be non-proprietary and conform to the following basic criteria:

- a. Display Size: The GUI workstation software shall graphically display in a minimum of 1024 by 768 pixels 24 bit True Color.
- b. General Graphic: General area maps shall show locations of controlled buildings in relation to local landmarks.
- c. Floor Plans: Floor plan graphics shall show heating and cooling zones throughout the buildings. Provide a visual display of temperature relative to their respective set points. The colors shall be updated dynamically as a zone's actual comfort condition changes.
- d. Mechanical Components: Mechanical system graphics shall show the type of mechanical system components serving any zone through the use of a pictorial representation of components. Selected I/O points being controlled or monitored for each piece of equipment shall be displayed with the appropriate engineering units. Animation shall be used for rotation or moving mechanical components to enhance usability. .
- e. Minimum System Graphics: Color graphics shall be selected and displayed via a web browser for the following:
 - 10.4.e.1. Each piece of equipment monitored or controlled including each terminal unit.
 - 10.4.e.2. Each building.
 - 10.4.e.3. Each floor and zone controlled.

- 10.5** Schedules: An operator (with proper access credentials) shall be able to define a Normal, Holiday or Override schedule for equipment groups to be defined by the school district through the GUI.
- a. Schedules: Schedules shall comply with the BACnet standards, (Schedule Object, Calendar Object, Weekly Schedule property and Exception Schedule property) and shall allow events to be scheduled based on:
 - 10.5.a.1. Types of schedule shall be Normal, Holiday or Override.
 - 10.5.a.2. A specific date.
 - 10.5.a.3. A range of dates.
 - 10.5.a.4. Any combination of Month of Year (1-12, any), Week of Month (1-5, last, any), Day of Week (M-Sun, Any).
 - 10.5.a.5. Wildcard (example, allow combinations like second Tuesday of every month).
 - b. Intelligent Scheduling: The control system shall be intelligent enough to automatically turn on any supporting equipment needed to control the environment in an occupied space. If the operator schedules an individual room in a VAV system for occupancy, for example, the control logic shall automatically turn on the VAV air handling unit, chiller, boiler and/or any other equipment required to maintain the specified comfort and environmental conditions within the room.
 - c. Partial Day Exceptions: Schedule events shall be able to accommodate a time range specified by the operator (ex: board meeting from 6 pm to 9 pm overrides Normal schedule for conference room).
- 10.6** Alarms: Alarms associated with a specific system, area, or equipment shall be displayed in the Action Pane by selecting an ' Alarms' view. Alarms, and reporting actions shall have the following capabilities:
- a. Alarms View: Each Alarm shall display an Alarms Category, date/time of occurrence, current status, alarm report and a bold URL link to the associated graphic for the selected system, area or equipment. The URL link shall indicate the system location, address and other pertinent information.
 - b. Alarm Time/Date Stamp: All events shall be generated at the DDC control module level and comprise the Time/Date Stamp using the standalone control module time and date.
 - c. Alarm Summary Counter: The view of Alarm in the Graphic Pane shall provide a numeric counter, indicating how many Alarms are active (in alarm), require acknowledgement and total number of Alarms in the BAS Server database.
 - d. Alarm Auto-Deletion: Alarms that are acknowledged and closed shall be auto-deleted from the database and archived to a text file after an operator defined period.
 - e. Alarm Reporting Actions: Alarm Reporting Actions specified shall be automatically launched (under certain conditions) after an Alarm is received by the BAS server software. Reporting Actions available shall be as follows:
 - 10.6.e.1. Email: Email shall be sent via any POP3-compatible e-mail server (most Internet Service Providers use POP3). Email messages may be copied to several email accounts. Note: Email reporting action shall also be used to support alphanumeric paging services, where email servers support pagers.
 - 10.6.e.2. File Write: The ASCII File write reporting action shall enable the operator to append operator defined alarm information to any alarm through a text file. The alarm information that is written to the file shall be

completely definable by the operator. The operator may enter text or attach other data point information (such as AHU discharge temperature and fan condition upon a high room temperature alarm).

- 10.7** Trends: As system is engineered, all points can be enabled to trend. Trends shall comprise analog, digital or calculated points simultaneously.
- a. Viewing Trends: The operator shall have the ability to view trends by using the Navigation Tree and selecting a Trends button in the Graphic Pane. The system shall allow y- and x-axis maximum ranges to be specified and shall be able to simultaneously graphically display multiple trends per graph.
 - b. Trends: Trend data shall be collected in the BAS server if historical trending is enabled for the object. Trend data, including run time hours and start time date shall be retained in non-volatile module memory. Systems that rely on a gateway/router to run trends are NOT acceptable.
 - c. Resolution. Sample intervals shall be as small as one second. Each trended point will have the ability to be trended at a different trend interval. When multiple points are selected for displays that have different trend intervals, the system will automatically scale the axis.
 - d. Zoom/Pan. It shall be possible to zoom-in on a particular section of a trend for more detailed examination and 'pan through' historical data by simply scrolling the mouse.
 - e. Numeric Value Display. It shall be possible to pick any sample on a trend and have the numerical value displayed.
- 10.8** Security Access: Systems that Security access from the web browser GUI to BAS server shall require a Login Name and Strong Password. Access to different areas of the BAS system shall be defined in terms of Role-Based Access Control privileges as specified:
- a. Roles: Roles shall reflect the actual roles of different types of operators. Each role shall comprise a set of 'easily understood English language' privileges. Roles shall be defined in terms of View, Edit and Function Privileges.
 - 10.8.a.1. View Privileges shall comprise: Navigation, Network, and Configuration Trees, Operators, Roles and Privileges, Alarm/Event Template and Reporting Action.
 - 10.8.a.2. Edit Privileges shall comprise: Set point, Tuning and Logic, Manual Override, and Point Assignment Parameters.
 - 10.8.a.3. Function Privileges shall comprise: Alarm/Event Acknowledgement, Control Module Memory Download, Upload, Schedules, Schedule Groups, Manual Commands, Print and Alarm/Event Maintenance.
- 10.9** Geographic Assignment of Roles: Roles shall be geographically assigned using a similar expandable/collapsible navigation tree. For example, it shall be possible to assign two HVAC Technicians with similar competencies (and the same operator defined HVAC Role) to different areas of the system.

11 EXECUTION

11.1 GENERAL

- a. Install system and materials in accordance with manufacturer's instructions, and as detailed on the project drawing set.

- b. Line and low voltage electrical connections to control equipment specified shall be furnished and installed by the Control System Contractor in accordance with these specifications.
- c. Equipment furnished by the Mechanical Contractor that is normally wired before installation shall be furnished completely wired. Control wiring normally performed in the field will be furnished and installed by the Control System Contractor.
- d. All control devices mounted on the face of control panels shall be clearly identified as to function and system served with permanent labels.

11.2 WIRING

- a. All electrical control wiring to the control panels shall be the responsibility of the Control System Contractor. Existing wiring may be used as appropriate.
- b. All wiring shall be in accordance with the National Electrical Code and any applicable local codes.
- c. Excess wire shall not be looped or coiled in the controller cabinet.
- d. Careful stripping of wire while inside the cabinet is required to ensure that no wire strand fragments land on circuit boards.
- e. Use manufacturer-specified wire for all network connections.
- f. Read installation instructions carefully. Any unavoidable deviations shall be approved by owner's rep prior to installation.
- g. Replacement of existing Air Handling Units or other HVAC equipment such as control valves outlined in specific building bid specifications are the responsibility of the Control Contractor and are to be installed by an authorized Mechanical Contractor or the Control Contractor where applicable.

11.3 ALTERATIONS TO SCOPE

- a. A change order request will be submitted to Ferndale School district for any alterations to the original bid scope including omissions, additions, repairs or replacement of existing components. Approval of any change order by the school district is required prior to proceeding with work.

12 ACCEPTANCE TESTING

- 12.1** Upon completion of the installation or phase of installation, the Control System Contractor shall load all system software and start-up the system. The Control System Contractor shall perform all necessary calibration, testing and de-bugging and perform all required operational checks to insure that the system is functioning in full accordance with these specifications.
- 12.2** The Control System Contractor shall perform tests to verify proper performance of components, routines and points. Repeat tests until proper performance results. This testing shall include a point-by-point log to validate 100% of the input and output points of the DDC system operation.
- 12.3** System Acceptance: Satisfactory completion is when the Control System Contractor has performed successfully all the required testing to show performance compliance with the requirements of the Contract Documents to the satisfaction of the Owner's Representative.

System acceptance shall be contingent upon completion and review of all corrected deficiencies.

13 OPERATOR TRAINING

- 13.1** During system commissioning and at such time acceptable performance of the Control System hardware and software has been established, the Control System Contractor shall provide on-site operator instruction to the owner's operating personnel. Operator instruction shall be done during normal working hours and shall be performed by a competent representative familiar with the system hardware, software and accessories.

14 WARRANTY PERIOD SERVICES

- 14.1** Equipment, materials and workmanship incorporated into the work shall be warranted for a period of one year from the time of system acceptance.
- 14.2** Within this period, upon notice by the Owner, any defects in the BMS due to faulty materials, methods of installation or workmanship shall be promptly repaired or replaced by the Control System Contractor at no expense to the Owner.
- 14.3** Maintenance of Computer Software Programs: The Control System Contractor shall maintain all software during the standard first year warranty period. In addition, all factory or sub-vendor upgrades to software during the first year warranty period shall be added to the systems, when they become available, at no additional cost. In addition to first year standard warranty, software provided by Control System Contractor shall come with an 18 month Software Maintenance license. All SNC and BAS Servers are included in this coverage. Labor to implement upgrades in years two through five are not included in standard warranty.
- 14.4** Maintenance of Control Hardware: The Control System Contractor shall inspect, repair, replace, adjust, and calibrate, as required, the controllers, control devices and associated peripheral units during the warranty period. The Control System Contractor shall then furnish a report describing the status of the equipment, problem areas (if any) noticed during service work, and description of the corrective actions taken. The report shall clearly certify that all hardware is functioning correctly.
- 14.5** Service Period: Calls for service by the Owner shall be honored within 24 hours and are not to be considered as part of routine maintenance.

15 WARRANTY ACCESS

- 15.1** The Owner shall grant to the Control System Contractor reasonable access to the BMS during the warranty period. Remote access to the BMS (for the purpose of diagnostics and troubleshooting, via the Internet, during the warranty period) will be allowed.

16 OPERATION & MAINTENANCE MANUALS

- 16.1** O&M manuals shall include the following elements, as a minimum:

- 16.2** As-built control drawings for all equipment.
- 16.3** As-built Network Communications Diagram.
- 16.4** General description and specifications for all components.

17 PROTECTION

- 17.1** Protect installed products until completion of project.
- 17.2** Touch-up, repair or replace damaged products before Substantial Completion.

18 BUILDING SPECIFIC DETAILS: See additional documents for all building specific details. This bid spec includes:

- 18.1** Cascadia Elementary School
- 18.2** Central Elementary School
- 18.3** Horizon Middle School
- 18.4** Alternate #1: Vista Middle School

Logoff

Back

Forward

Home

RTU 1

GF 1

GF 2

GF 3

GF 4

GF 5

GF 6

GF 7

Wrestling Furnaces

EF / DHW / Ext Lts

Floorplan

Fieldhouse Alarms

Schedules

Equipment History Trends

History Chart Builder

11-Feb-21 11:06 AM PST

Outside Air Temp: 31.27 °F

GF_2 Boys LR

Left click on item for history

GF_2 Status

Space Temperature: 70.72 °F

Occupied Schedule: Occupied

Event Schedule: Unoccupied

Economizer Status: Off

Unoccupied Override: Off

Occupancy Sensor Status: ON

EF4_PROOF: ON

GF_2 Setpoints

Space Setpoint: 70.00 °F

Heat Lockout Temp: 65.00 °F

Minimum Supply Air Temp: 55.00 °F

Occupied Heat SP: 68.50 °F

Occupied Cool SP: 74.00 °F

Unoccupied Heat Setpoint: 55.00 °F

Unoccupied Cool Setpoint: 85.00 °F

Minimum Outside Air Damper Position: 100.00 %

GF_2 Alarms

Fan Failure Alarm: Off

Fan Running in Hand Alarm: Off

Low Space Temperature Alarm: Off

Outside Air Damper: 64.10 %

Mixed Air Temp: 45.30 °F

Supply Air Temp: 56.96 °F

Return Air Damper: 35.9

Fan Start: On

Fan Proof: On

Heat Start: Off

Heat Modulation: 0.00 %

0% modulation = Low fire

Space Temperature: 70.72 °F

Cascadia Elementary School HVAC Controls Replacement

1 HEATING WATER BOILER SYSTEM

1.1 Scope of Work: Replace existing heating water system DDC control with new DDC control. Existing Control Valves, RIB relays, CTs, and 24 Vac transformers are to be retained if operational. HWS, HWR, and OSA temp sensors to be replaced with sensors compatible with new DDC controls. Add Boiler 1 and 2 Supply Temperature

1.2 Inputs:

- a. Heating Water Supply Temperature
- b. Heating Water Return Temperature
- c. Heating Water Pump-1 Status
- d. Pump-1 Speed Feedback
- e. Heating Water Pump-2 Status
- f. Pump-2 Speed Feedback
- g. Boiler Management Panel Alarm
- h. Boiler Emergency Shutdown
- i. Outside Air Temperature
- j. Boiler 1 HWS Temperature
- k. Boiler 2 HWS Temperature
- l. HWS Differential Pressure 1
- m. HWS Differential Pressure 2

1.3 Outputs:

- a. Boiler Enable
- b. Boiler Firing Rate
- c. Pump-1 Speed
- d. Pump-2 Speed
- e. Heating Water Circulation Pump-1 Start/Stop
- f. Heating Water Circulation Pump-2 Start/Stop

1.4 Sequence of Operation: The boiler plant will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

1.5 Alarms shall be provided as follows:

- a. Heating Water Circulation Pump Failure: Pump commanded on, but status is off.
- b. Heating Water Circulation Pump in Hand: Pump commanded off, but the status is on.
- c. Low Heating Water Supply Temperature: If the boiler has been turned on for 30 minutes (adj) and the heating water supply temperature is less than 100 deg F (adj)

2 AIR HANDLERS (AHU'S 1,3,4,5,6,7,11,13,14,15,16,17)

2.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

2.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Freeze Stat

2.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air/Return Air Damper control
- c. Hot Water Valve Control

2.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

2.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat: Freeze Status indication requiring a manual reset.

3 AIR HANDLER 2

3.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

3.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Return Fan Status
- h. Freeze Stat

3.3 Outputs:

- a. Supply Fan Start/Stop
- b. Return Fan Start/Stop
- c. Outside Air/Return Air Damper control
- d. Hot Water Valve Control

3.4 Sequence of Operation: The Air Handler will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

3.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Return Fan Failure: Fan commanded on, but status is off.
- e. Return Fan in Hand: Fan commanded off, but the status is on.
- f. Freeze Stat: Freeze Status indication requiring a manual reset.

4 AIR HANDLER 3

4.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, and Return Air sensors to be replaced with sensors compatible with new DDC controls.

4.2 Inputs:

- a. Discharge Air Temperature
- b. Mixed Air Temperature
- c. Return Air Temperature
- d. Supply Fan Status
- e. Freeze Stat

4.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air/Return Air Damper control

4.4 Sequence of Operation: The Air Handler will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

4.5 Alarms shall be provided as follows:

- a. Supply Fan Failure: Fan commanded on, but status is off.
- b. Supply Fan in Hand: Fan commanded off, but the status is on.
- c. Freeze Stat: Freeze Status indication requiring a manual reset.

5 AIR HANDLER 8

5.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, Smoke Detectors, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

5.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Freeze Stat
- h. Duct Smoke Detector

5.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air Damper control

5.4 Sequence of Operation: The Air Handler will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

5.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat: Freeze Status indication requiring a manual reset.
- e. Duct Smoke Alarm

6 AIR HANDLER 9

6.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, Smoke Detectors, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, Space Temp and CO2 sensors to be replaced with sensors compatible with new DDC controls.

6.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Freeze Stat
- h. CO2
- i. Duct Smoke Detector

6.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air/Return Air Damper control
- c. Hot Water Valve Control

6.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

6.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat: Freeze Status indication requiring a manual reset.
- e. Duct Smoke Alarm
- f. CO2: High CO2 detected (1200 ppm Adj.)

7 AIR HANDLER 10

7.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, Smoke Detectors, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

7.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Return Fan Status
- h. Freeze Stat
- i. Supply Air Smoke Detector
- j. Return Air Smoke Detector
- k. CO2

7.3 Outputs:

- a. Supply Fan Start/Stop
- b. Return Fan Start/Stop
- c. Outside Air/Return Air Damper control
- d. Exhaust Air Damper control
- e. Hot Water Valve Control

7.4 Sequence of Operation: The Air Handler will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

7.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Return Fan Failure: Fan commanded on, but status is off.
- e. Return Fan in Hand: Fan commanded off, but the status is on.
- f. Freeze Stat: Freeze Status indication requiring a manual reset.
- g. Duct Smoke Alarm
- h. CO2: High CO2 detected (1200 ppm Adj.)

8 AIR HANDLER 12

8.1 Scope of Work: Replace existing Air Handler DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, and 24 Vac transformers to be retained if operational. Discharge Air, Mixed Air, Return Air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

8.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Return Air Temperature
- f. Supply Fan Status
- g. Freeze Stat

8.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air/Return Air Damper control
- c. Hot Water Valve Control
- d. DX Cooling Start/Stop

8.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

8.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Low Discharge Air Temp: If the discharge temperature is less than 50 deg F (adj.)
- c. Supply Fan Failure: Fan commanded on, but status is off.
- d. Supply Fan in Hand: Fan commanded off, but the status is on.
- e. Freeze Stat: Freeze Status indication requiring a manual reset.

9 ISOLATION DAMPERS

9.1 Scope of Work: Replace existing Isolation Damper DDC controls with new DDC controls. Existing Damper Actuators and 24 Vac transformers to be retained if operational.

9.2 Inputs:

- a. Damper Actuator x1 end switch
- b. Damper Actuator x2 end switch

9.3 Outputs:

- a. Damper Actuator x1 control
- b. Damper Actuator x2 control

9.4 Sequence of Operation: The Damper Actuators will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

9.5 Alarms shall be provided as follows:

- a. Damper Open Fail: The damper is commanded open but the end switch remains opened.
- b. Damper Close Fail: The damper is commanded closed but the end switch remains closed.

10 UNIT HEATERS

10.1 Scope of Work: Replace existing Unit Heater DDC controls with new DDC controls. Existing Control Valve Actuators, RIB relays, and 24 Vac transformers to be retained if operational. Space Temp sensors to be replaced with sensors compatible with new DDC controls.

10.2 Inputs:

- a. Space Temperature
- b. Exhaust Fan Status where applicable
- c. Isolation Damper End Switch where applicable

10.3 Outputs:

- a. Fan Start/Stop
- b. Hot Water Valve control
- c. Exhaust Fan Start/Stop where applicable
- d. Isolation Damper Control where applicable

10.4 Sequence of Operation: The Unit Heaters will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

10.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.

11 MDF ROOM

11.1 Scope of Work: Replace existing MDF Room DDC control with new DDC control. Discharge air and Space Temp sensors to be replaced with sensors compatible with new DDC controls. Space sensors to be a blank plate, Stainless steel.

11.2 Inputs:

- a. Space Temperature
- b. AC unit Discharge Air Temperature
- c. Fire Alarm Panel Monitor
- d. AC unit Common Alarm Monitor

11.3 Sequence of Operation: The Elevator Room Controller will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

11.4 Alarms shall be provided as follows:

- a. Fire Alarm Active
- b. AC Unit Common Alarm
- c. Space Temperature Alarm: If Room Temp rises above 80 deg F (Adj.)

12 HEATING COILS

12.1 Scope of Work: Replace existing Heating Coil DDC controls with new DDC controls. Existing Control Valves and 24 Vac transformers to be retained if operational. Discharge air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

12.2 Inputs:

- a. Supply Air Temperature
- b. Space Temperature

12.3 Outputs:

- a. Hot Water Valve Control

12.4 Sequence of Operation: The Heating Coil units will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

12.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)

13 EXHAUST FANS

13.1 Scope of Work: Replace existing Exhaust Fan DDC controls where dedicated EF controllers exist with new DDC controls. Existing RIB relays and 24 Vac transformers to be retained if operational.

13.2 Inputs:

- a. Exhaust Fan Status

13.3 Outputs:

- a. Exhaust Fan Start/Stop

13.4 Sequence of Operation: The Exhaust Fans will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

13.5 Alarms shall be provided as follows:

- a. EF Failure: Fan commanded on, but status is off.
- b. EF in Hand: Fan commanded off, but the status is on.

14 EXTERIOR LIGHTING

14.1 Scope of Work: Replace existing Lighting DDC controls with new DDC controls. Existing RIB relays and 24 Vac transformers to be retained if operational.

14.2 Inputs:

- a. Exterior Lights Status

14.3 Outputs:

- a. Exterior Lights Start/Stop

14.4 Sequence of Operation: The Exhaust Fans will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

14.5 Alarms shall be provided as follows:

- a. Exterior Lights Proof Alarm: The Lights are commanded on but the status is off.

Central Elementary School HVAC Controls Replacement

2 HEATING WATER BOILER SYSTEM

14.6 Scope of Work: Replace existing heating water system DDC control with new DDC control. Existing Control Valve Actuators, RIB relays, CTs, and 24 Vac transformers are to be retained if operational. HWS, HWR, and OSA temp sensors to be replaced with sensors compatible with new DDC controls. Boiler 1,2 and 3 HWS temperature sensors are to be added.

14.7 Inputs:

- a. Heating Water Supply Temperature
- b. Heating Water Return Temperature
- c. Heating Water Pump-1 Status
- d. Heating Water Pump-2 Status
- e. Outside Air Temperature
- f. Hot Water Tank 1 Circulation Pump Status
- g. Boiler 1 HWS Temperature
- h. Boiler 2 HWS Temperature
- i. Boiler 3 HWS Temperature

14.8 Outputs:

- a. Boiler 1 Enable
- b. Boiler 2 Enable
- c. Boiler 3 Enable
- d. Heating Water Circulation Pump-1 Start/Stop
- e. Heating Water Circulation Pump-2 Start/Stop

14.9 Sequence of Operation: The boiler plant will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

14.10 Alarms shall be provided as follows:

- a. Heating Water Circulation Pump Failure: Pump commanded on, but status is off.
- b. Heating Water Circulation Pump in Hand: Pump commanded off, but the status is on.
- c. Low Heating Water Supply Temperature: If the boiler has been turned on for 30 minutes (adj) and the heating water supply temperature is less than 100 deg F (adj)

15 CONVECTOR UNITS

15.1 Scope of Work: Replace existing Convector Unit DDC controls with new DDC controls. Existing Control Valve Actuators and 24 Vac transformers to be retained if operational. HWS and space Temp sensors to be replaced with sensors compatible with new DDC controls.

15.2 Inputs:

- a. Supply Coil Temperature
- b. Space Temperature
- c. Additional Supply Coil Temperature on Convector 3 only

15.3 Outputs:

- a. Hot Water Valve Control
- b. Additional Control Valve on Convector 3 only

15.4 Sequence of Operation: The convector units will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

15.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)

16 Unit Ventilators

16.1 Scope of Work: Replace existing Unit Ventilator DDC controls with new DDC controls. Existing Control Valve Actuators, Freeze Stats, Damper Actuators, RIB relays, and 24 Vac transformers to be retained if operational. Discharge air, Mixed air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

16.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint Adjust.
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Fan Status
- f. Additional Supply Coil Temperature on Convactor 3 only

16.3 Outputs:

- a. Fan Start/Stop
- b. Heating Coil Enable
- c. Exhaust Fan Start/Stop (UV-1 and 3 only)
- d. Outside/Return Air Damper control
- e. Hot Water Valve control
- f. Exhaust Fan-1 and Exhaust Fan-2 Start/Stop

16.4 Sequence of Operation: The Unit Ventilators will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

16.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat Tripped: The unit has shut down due to Freeze stat. Requires manual reset.

17 Heating Coils

17.1 Scope of Work: Replace existing Heating Coil DDC controls with new DDC controls. Existing Control Valves, Freeze Stats, Damper actuators, RIBU1C relays, and 24 Vac transformers are to be retained if operational. Discharge air, Mixed air, and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

17.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint Adjust.
- c. Discharge Air Temperature
- d. Mixed Air Temperature
- e. Fan Status
- f. Additional Supply Coil Temperature on Convactor 3 only

17.3 Outputs:

- a. Fan Start/Stop
- b. Heating Coil Enable
- c. Exhaust Fan Start/Stop (UV-1 and 3 only)
- d. Outside/Return Air Damper control
- e. Hot Water Valve control
- f. Exhaust Fan-1 and Exhaust Fan-2 Start/Stop

17.4 Sequence of Operation: The Unit Ventilators will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

17.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat Tripped: The unit has shut down due to Freeze stat. Requires manual reset.

18 EXTERIOR LIGHTING

18.1 Scope of Work: Replace existing Lighting Time Clock controls with new DDC controls.

18.2 Inputs:

- a. Exterior Lights Status

18.3 Outputs:

- a. Exterior Lights On/Off

18.4 Sequence of Operation: The Exhaust Fans will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

18.5 Alarms shall be provided as follows:

- a. Exterior Lights Proof Alarm: The Lights are commanded on but the status is off.

Horizon Middle School HVAC Controls Replacement

3 HEATING WATER BOILER SYSTEM

18.6 Scope of Work: Replace existing heating water system DDC control with new DDC control. Existing Control Valves, RIB relays, CTs, DP switches, and 24 Vac transformer to be retained if operational. HWS, HWR, and OSA temp sensors to be replaced with sensors compatible with new DDC controls. Add Boiler 1 and 2 Supply Temperature

18.7 Inputs:

- a. Heating Water Return Temperature
- b. Heating Water Pump-1 Status
- c. Heating Water Pump-2 Status
- d. Heating Water Pump-3 Status
- e. Heating Water Pump-3A Status
- f. Outside Air Temperature
- g. Boiler 1 HWS Temperature
- h. Boiler 2 HWS Temperature
- i. Combustion Damper Open
- j. B-1 Alarm
- k. B-2 Alarm

18.8 Outputs:

- a. Boiler 1 Enable
- b. Boiler 2 Enable
- c. Pump 1 Start/Stop
- d. Pump 2 Start/Stop
- e. Pump Start/Stop
- f. Pump 3A Start/Stop
- g. Boiler 1 Lead
- h. Boiler 2 Lead
- i. Pump 1 Fail
- j. Pump 2 Fail
- k. System HWV
- l. OSA LED Display

18.9 Sequence of Operation: The boiler plant will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

18.10 Alarms shall be provided as follows:

- a. Heating Water Circulation Pump Failure: Pump commanded on, but status is off.
- b. Heating Water Circulation Pump in Hand: Pump commanded off, but the status is on.
- c. Low Heating Water Supply Temperature: If the boiler has been turned on for 30 minutes (adj) and the heating water supply temperature is less than 100 deg F (adj)

19 CABINET HEATER

19.1 Scope of Work: Replace existing Cabinet Heater DDC control with new DDC control. Existing Freeze Stats, Control Valves, RIB relays, Current transmitters, Damper Actuators, and 24 Vac transformers to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

19.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature
- d. Supply Fan Status
- e. Freeze Stat

19.3 Outputs:

- a. Supply Fan Start/Stop
- b. Outside Air/Return Air Damper control
- c. Hot Water Valve Control

19.4 Sequence of Operation: The Cabinet Heater will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

19.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat: Freeze Status indication requiring a manual reset.

20 FIN TUBE HEATER

20.1 Scope of Work: Replace existing Fin Tube Heater DDC controls with new DDC controls. Existing Control Valve Actuators, RIB relays, and 24 Vac transformers to be retained if operational. Space Temp sensors to be replaced with sensors compatible with new DDC controls.

20.2 Inputs:

- a. Space Temperature
- b. Exhaust Fan Status where applicable

20.3 Outputs:

- a. Hot Water Valve control

20.4 Sequence of Operation: The Fin Tube Heaters will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

20.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)

21 HEATING COIL

21.1 Scope of Work: Replace existing Heating Coil DDC controls with new DDC controls. Existing Control Valve Actuators, RIB relays, and 24 Vac transformers to be retained if operational. Space Temp sensors to be replaced with sensors compatible with new DDC controls.

21.2 Inputs:

- a. Space Temperature
- b. Exhaust Fan Status where applicable

21.3 Outputs:

- a. Hot Water Valve control

21.4 Sequence of Operation: The Heating Coils will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

21.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)

22 DOMESTIC HOT WATER.

22.1 Scope of Work: Replace existing Domestic Hot Water DDC control with new DDC control Space Temp sensor to be replaced with sensor compatible with new DDC controls.

22.2 Inputs:

- a. DHW-1 Start/Stop
- b. DHW-2 Start/Stop
- c. DHW-3 Start/Stop
- d. EF-14 Start/Stop
- e. UH-1 Start/Stop

22.3 Outputs:

- a. DHW-1 Supply Temp
- b. DHW-2 Supply Temp
- c. DHW-3 Supply Temp
- d. Circulation Pump-4 Status
- e. UH-1 Temp
- f. DHW Return Temp
- g. OSA Temp
- h. EF-14 Status

22.4 Sequence of Operation: The Domestic Hot Water, UH, and EF will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

22.5 Alarms shall be provided as follows:

- a. Fan Failure: Fan commanded on, but status is off.
- b. Fan in Hand: Fan commanded off, but the status is on.
- c. Space Temperature Alarm: If Room drops below 45 deg F (Adj.)

23 VAV

23.1 Scope of Work: Replace existing VAV DDC controls with new DDC controls. Existing Control Valves, Damper Actuators, and 24 Vac transformers are to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

23.2 Inputs:

- a. Space Temperature
- b. Space Temperature Setpoint
- c. Discharge Air Temperature

23.3 Outputs:

- a. Supply Fan Start/Stop
- b. Air Damper control
- c. Hot Water Valve Control

23.4 Sequence of Operation: The VAV boxes will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

23.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)

24 AHU (2-5, 10,11)

24.1 Scope of Work: Replace existing AHU DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, relays, DP switches and 24 Vac transformers to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

24.2 Inputs:

- a. Space Temperature (AHU 11 only)
- b. Discharge Air Temperature
- c. Mixed Air Temperature
- d. Supply Fan Status
- e. Return Fan Status (2-5 only)
- f. Freeze Stat
- g. Smoke Alarm
- h. High-Pressure Alarm

24.3 Outputs:

- a. Supply Fan Start/Stop
- b. Return Fan Start/Stop (2-5 only)
- c. OSA, Return, Exhaust (AHU 4 only) Damper Control
- d. Heating Water Valve Control

24.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

24.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.

- d. Freeze Stat: Freeze Status indication requiring a manual reset.
- e. Smoke Alarm
- f. High-Pressure Alarm

25 AHU (1,6)

25.1 Scope of Work: Replace existing AHU DDC control with new DDC control. Existing Freeze Stat, Control Valve, relays, DP switches and 24 Vac transformer to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

25.2 Inputs:

- a. Discharge Air Temperature
- b. Mixed Air Temperature
- c. Supply Fan Status
- d. Return CO2
- e. Freeze Stat
- f. Smoke Alarm
- g. High-Pressure Alarm

25.3 Outputs:

- a. Supply Fan Start/Stop
- b. OSA, Return Damper Control
- c. Heating Water Valve Control

25.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

25.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Freeze Stat: Freeze Status indication requiring a manual reset.
- e. Smoke Alarm
- f. High-Pressure Alarm

26 AHU (7,9)

26.1 Scope of Work: Replace existing AHU DDC controls with new DDC controls. Existing Freeze Stats, Control Valves, relays, DP sensors and switches and 24 Vac transformers to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

26.2 Inputs:

- a. Discharge Air Temperature
- b. Mixed Air Temperature
- c. Supply Fan Status
- d. Supply Fan Alarm
- e. Return Fan Status (AHU 7 only)
- f. Return Fan Alarm (AHU 7 only)
- g. Supply Fan SP
- h. Supply Duct SP
- i. Return Duct SP (AHU 7 only)

- j. Freeze Stat
- k. Smoke Alarm
- l. High-Pressure Alarm

26.3 Outputs:

- a. Supply Fan VFD Enable
- b. Return Fan VFD Enable
- c. OSA, Return, Relief (AHU 7 only) Damper Control
- d. Heating Water Valve Control
- e. Supply Fan Speed
- f. Return Fan Speed (AHU 7 only)

26.4 Sequence of Operation: The Air Handlers will be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

26.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.
- d. Return Fan Failure: Fan commanded on, but status is off.
- e. Return Fan in Hand: Fan commanded off, but the status is on.
- f. Freeze Stat: Freeze Status indication requiring a manual reset.
- g. Smoke Alarm
- h. High-Pressure Alarm

27 MISCELLANEOUS CONTROLLERS (EMCP)

27.1 Scope of Work: Replace the existing 16 EMCP DDC controllers with new DDC controllers. Existing relays, DP switches, Damper Actuators, and 24 Vac transformers are to be retained if operational. Discharge Air and Space Temp sensors to be replaced with sensors compatible with new DDC controls.

27.2 Inputs: See ATS drawings

27.3 Outputs: See ATS drawings

27.4 Sequence of Operation: The miscellaneous controls to be controlled by the new DDC system. All functions of the ATS system will be taken over by the new system. The sequence will be identical to the existing sequence shown on the ATS plans.

27.5 Alarms shall be provided as follows:

- a. Low Space Temp: If the space temperature is less than 45 deg F (adj.)
- b. Supply Fan Failure: Fan commanded on, but status is off.
- c. Supply Fan in Hand: Fan commanded off, but the status is on.

Alternate #1

Vista Middle School HVAC Controls Replacement

Scope of Work

Replace existing Schneider Electric Microzone DDC controls system.

Existing Freeze Stats, Control Valves, Control Relays, Current Transmitters, Damper Actuators and 24 VAC Transformers to be retained if operational. Supply Air, Mixed Air & Return Air sensors to be replaced with sensors compatible to new DDC controls. Space Temp sensors to be replaced with setpoint adjustable sensors with CO2 monitoring, compatible with new DDC controls.

Functionality of any reused Controls System Components to be field tested. If needed, replacement of faulty Components to be coordinated with Ferndale School District Maintenance Department.

Sequence of Operations

Existing Heat Pumps and AHUs

Units will start based on an occupancy schedule. An optimal start routine will operate the unit in Warmup mode to bring spaces to temperature setpoint when schedule goes into occupied mode. The fan will be energized, the unit will cycle between the heating and cooling mode to maintain occupied room setpoint. In heating mode, the OA damper shall remain closed. During the occupied mode the OA dampers will position to minimum and modulate toward the open on a call for cooling if the OA temperature is below 75° (adjustable) (Adjustable) or to maintain a maximum CO2 level of 1000 ppm (adjustable). On a further call for cooling (AHUs that have mechanical cooling) the mechanical cooling will cycle on. On a call for heating the dampers will position to minimum OA and the heating valve will modulate open during the unoccupied mode the unit will be de-energized. The fan will be off, the OA dampers will be closed, and the compressor will be off. The unit will operate in the unoccupied mode to maintain the night setback setpoint of 55Deg° (adjustable), (adjustable). During the unoccupied mode of operation, the OA damper will remain closed.

If the temperature sensor at TLL-1 falls below 40° (adjustable); the unit will be de-energized, OA dampers will close, cooling will be off and the heating valve will drive to 100% open. TLL-1 will require a manual reset to restart system once the temperature rises above setpoint plus a differential of 5° (adjustable).

Units 2000 CFM or above have duct mounted smoke detectors which disable unit during an alarm condition.

Cabinet Unit Heaters

These units will start via operator entered time schedule. The fan will be energized, and the heating valve will modulate open on a call for heating from the thermostat.

Hot Water Tanks/DHW System

Hot water systems will be enabled via operator entered time schedule.

Duct Coil Control/Reheat

Control valves will modulate in response to room temperature, sensed by thermostat, to maintain room setpoint.

EFs

Fans will cycle on during the occupied mode of operation (after warmup).

Boilers

Boilers will be enabled via a boiler schedule or OA Temperature low limit of 40° (adjustable) if unoccupied. They will rotate in a lead/lag manner. Boilers will be disabled when the OA temperature is above 70° (adjustable). Circulating pumps will operate whenever the boilers are energized. The hot water supply temperature will be controlled via a reset schedule. When the OA temperature is 35° (adjustable) then loop supply temperature shall be 200° (adjustable). When the OA temperature is 70° (adjustable) then loop supply temperature shall be 150° (adjustable). During the unoccupied mode the system will cycle based on heating demand from the HPs. The OA lockout setpoint will be 60° (adjustable) during the unoccupied mode. Once boilers are enabled they will have a minimum run time to avoid short cycling.

Fire Alarm System Shutdown

Upon detecting a general fire alarm from the building fire alarm system all HVAC equipment will be shutdown.

1. HEATING WATER SYSTEM 1 (EXISTING MZ – 7) CONTROLLER (1 UNIT)

1.1 Scope of Work: Replace existing DDC heating water system controls with new DDC controls. System consists of (2) hot water boilers, (2) heating water pumps in the south wing, (1) DHW pump, (3) EFs, (3) Reheat Valves and (1) CUH in Rm-26F. System is typical for (1) Unit.

1.2 Inputs:

- a. Outdoor Air Temperature Sensor
- b. Large RNO Room Temperature
- c. Kitchen Temperature
- d. Boiler-1 Supply Temperature
- e. Boiler-2 Supply Temperature
- f. Heating Water Loop Return Temperature
- g. Hallway B4 Temperature
- h. Rm 26F CUH Fan Proof
- i. Power Roof EF Proof
- j. EF-5 Proof
- k. Rm B6 EF Proof
- l. Heating Water Pump – 1 Proof
- m. Heating Water Pump – 2 Proof
- n. DHW Pump Proof
- o. Rm 26F CUH Supply Air Temperature
- p. Small RNO Heating Water Valve Supply Air Temperature
- q. Large RNO rm Valves Supply Air Temperature

1.3 Outputs:

- a. Boiler - 1 Start
- b. Boiler - 2 Start
- c. Boiler - 1 Setpoint
- d. Boiler - 2 Setpoint
- e. Heating Water Pump - 1 Start
- f. Heating Water Pump - 2 Start
- g. DHW Pump Start
- h. Power Roof EF, EF-5 and Room B6 EF Start
- i. Rm 26F CUH Heating Water Valve
- j. Small RNO rm Heating Water Valve
- k. Large RNO rm Valves 2 Coils/HWV Wire in Parallel.

2. GYM BATHROOM UV CONTROLLER (TYPICAL OF 4)

2.1 Scope of Work: Replace existing DDC Gym Bathroom UV controls with new DDC controls. System is typical for (4) Units.

2.2 Inputs:

- a. Supply Air Temperature
- b. Space Temperature (Adjustable)
- c. Freeze Stat Input
- d. Supply Fan Proof

2.3 Outputs:

- a. Supply Fan Start
- b. EF Start
- c. Heating Water Coil Valve
- d. Damper Actuator

3. CUH RM. 27U, ROOF EF AND HOT WATER TANK RM. 27X (1 UNIT)

3.1 Scope of Work: Replace existing DDC controls for CUH rm 27U, roof EF and hot water tank rm 27X with new DDC controls. System is typical for (1) Unit.

3.2 Inputs:

- a. Supply Air Temperature
- b. Mixed Air Temperature
- c. Space Temperature (Adjustable)
- d. Freeze Stat Input
- e. CUH rm 27U Supply Fan Proof
- f. EF Proof
- g. Water Heater Supply Temperature
- h. Circ Pump Proof

3.3 Outputs:

- a. CUH rm 27U Supply Fan Start
- b. EF Start
- c. Heating Water Coil Valve
- d. Water Heater & Circ Pump Start
- e. Damper Actuator

4. RHC RM. 27P AND 27K

4.1 Scope of Work: Replace existing DDC controls for reheat coils in rm 27P and 27K with new DDC controls. System is typical for (1) unit.

4.2 Inputs:

- a. Space Temperature rm 27K (Adjustable)
- b. Space Temperature rm 27P (Adjustable)
- c. Reheat Coil rm 27K Supply Air Temperature
- d. Reheat Coil rm 27P Supply Air Temperature

4.3 Outputs:

- a. Reheat Coil rm 27K
- b. Reheat Coil rm 27P

5. SHOP UNIT VENTS (1 UNIT)

5.1 Scope of Work: Replace existing DDC controls for shop UVs with new DDC controls. System is typical for (1) unit.

5.2 Inputs:

- a. Supply Air Temperature UV - 1
- b. Supply Air Temperature UV – 2
- c. Mixed Air Temperature UV – 1
- d. Mixed Air Temperature UV – 2
- e. Space Temperature (Adjustable)
- f. Freeze Stat Input UV – 1
- g. Freeze Stat Input UV – 2
- h. UV – 1 Supply Fan Proof
- i. UV – 2 Supply Fan Proof
- j. EF – 1 Proof
- k. EF – 2 Proof

5.3 Outputs:

- a. UV – 1 Supply Fan Start
- b. UV – 2 Supply Fan Start
- c. EF – 1 Start
- d. EF – 2 Start
- e. UV – 1 Heating Water Coil Valve
- f. UV – 2 Heating Water Coil Valve
- g. UV – 1 Damper Actuator
- h. UV – 2 Damper Actuator

6. TYPICAL HEAT PUMP UNIT (17 UNITS)

6.1 Scope of Work: Replace existing DDC controls for a typical Heat Pump with new DDC controls. System is typical for (17) units.

6.2 Inputs:

- a. Supply Air Temperature
- b. Mixed Air Temperature
- c. Space Temperature (Adjustable)
- d. Freeze Stat Input
- e. Supply Fan Proof

- f. Return Fan Proof
- g. Auxiliary Device Proofs if Present. (See Controller Schedule for Auxiliary Devices)

6.3 Outputs:

- a. Supply Fan Start (Interlocked with Return Fan)
- b. DX Cooling Start
- c. Heating Water Coil Valve
- d. Damper Actuator
- e. Auxiliary Device Control if Present (See Controller Schedule for Auxiliary Devices)

7. AH-1 SCIENCE RM A9, AH-1 SCIENCE RM A11, AH-2 CLASSROOM A4 & AH-2 TECHNOLOGY A6 (4 UNITS)

7.1 Scope of Work: Replace existing DDC controls for a typical AH-1 (2) & AH-2 (2) with new DDC controls. System is typical for (4) units.

7.2 Inputs:

- a. Supply Air Temperature
- b. Space Temperature (Adjustable)
- c. Freeze Stat Input
- d. Supply Fan Proof
- e. EF – 1 Proof

7.3 Outputs:

- a. Supply Fan Start
- b. DX Cooling Start
- c. Heating Water Coil Valve
- d. Damper Actuator
- e. EF – 1 Start

8. CUH FOYER A1, CUH COORIDOR A12 AND RH A10 (1 UNIT)

8.1 Scope of Work: Replace existing DDC controls for CUH Foyer A1, CUH Corridor A12 and RH A10 with new DDC controls. System is typical for (1) unit.

8.2 Inputs:

- a. Space Temperature rm A12 (Adjustable)
- b. Space Temperature rm A10 (Adjustable)
- c. Foyer A1 Return Air Temperature
- d. CUH Foyer A1 Supply Fan Proof
- e. CUH Foyer A1 Supply Air Temperature
- f. CUH Corridor A12 Supply Fan Proof
- g. CUH Corridor A12 Supply Air Temperature
- h. Reheat Coil prep rm Supply Air Temperature

8.3 Outputs:

- a. CUH Foyer A1 Supply Fan Start
- b. CUH Foyer A1 Heating Water Coil Valve
- c. CUH Corridor A12 Supply Fan Start
- d. CUH Corridor A12 Heating Water Coil Valve
- e. Reheat Coil prep rm

9. MZ – 1 REHEAT COIL CONTROLLER (1 UNIT)

9.1 Scope of Work: Replace existing DDC controls for MZ-1 with new DDC controls. System is typical for (1) unit.

9.2 Inputs:

- a. Space Temperature rm 25A (Adjustable) (Served by AHU-3)
- b. Space Temperature rm 25B (Adjustable) (Served by AHU-3)
- c. Space Temperature rm 25D (Adjustable) (Served by AHU-3)
- d. Space Temperature rm 25 (Adjustable) (Served by AHU-3)
- e. Space Temperature rm 26 (Adjustable) (Served by AHU-3)
- f. Space Temperature rm 26R (Adjustable) (Served by AHU-3)
- g. Reheat Coil rm 25A Supply Air Temperature
- h. Reheat Coil rm 25B Supply Air Temperature
- i. Reheat Coil rm 25D Supply Air Temperature
- j. Reheat Coil rm 25 Supply Air Temperature
- k. Reheat Coil rm 26 Supply Air Temperature
- l. Reheat Coil rm 26R Supply Air Temperature

9.3 Outputs:

- a. Reheat Coil rm 25A
- b. Reheat Coil rm 25B
- c. Reheat Coil rm 25D
- d. Reheat Coil rm 25
- e. Reheat Coil rm 26
- f. Reheat Coil rm 26R

10. MZ – 2 REHEAT COIL CONTROLLER (1 UNIT)

10.1 Scope of Work: Replace existing DDC controls for MZ-2 with new DDC controls. System is typical for (1) unit.

10.2 Inputs:

- a. Space Temperature rm 29A (Adjustable) (AHU-1)
- b. Space Temperature rm Art (AHU-1)
- c. Space Temperature rm 21 (Adjustable) (AHU-2)

- d. Space Temperature rm 20 (Adjustable) (AHU-2)
- e. Space Temperature rm Home EC (Adjustable) (AHU-1)
- f. Space Temperature rm Mech DRW. (Adjustable) (AHU-1)
- g. Reheat Coil rm 29A Supply Air Temperature
- h. Reheat Coil Corridor Supply Air Temperature
- i. Reheat Coil rm 21 Supply Air Temperature
- j. Reheat Coil rm 20 Supply Air Temperature
- k. Reheat Coil rm 20C & 20D Supply Air Temperature
- l. Reheat Coil rm Art Supply Air Temperature
- m. Reheat Coil rm Mech DRW Supply Air Temp

10.3 Outputs:

- a. Reheat Coil rm 29A
- b. Reheat Coil Corridor
- c. Reheat Coil rm 21
- d. Reheat Coil rm 20
- e. Reheat Coil rm 20C & 20D
- f. Reheat Coil rm Art
- g. Reheat Coil Mech DRW

11. MZ – 3 REHEAT COIL CONTROLLER (1 UNIT)

11.1 Scope of Work: Replace existing DDC controls for MZ-3 with new DDC controls. System is typical for (1) unit.

11.2 Inputs:

- a. Space Temperature rm 28G (Adjustable)
- b. Space Temperature rm 28D (Adjustable)
- c. Space Temperature rm 28 (Adjustable)
- d. Space Temperature Corridor 1A
- e. Space Temperature Corridor 12A
- f. Reheat Coil rm 28G Supply Air Temperature
- g. Reheat Coil rm 28D Supply Air Temperature
- h. Reheat Coil rm 28 Supply Air Temperature
- i. Reheat Coil Corridor 1A Supply Air Temperature
- j. Reheat Coil Corridor 12A Supply Air Temperature
- k. Admin UHs Proofs

11.3 Outputs:

- a. Reheat Coil rm 28G
- b. Reheat Coil rm 28D
- c. Reheat Coil rm 28
- d. Reheat Coil Corridor 1A

- e. Reheat Coil Corridor 12A
- f. Admin UHs Start

12. MZ – 4 REHEAT COIL CONTROLLER (1 UNIT)

12.1 Scope of Work: Replace existing DDC controls for MZ-4 with new DDC controls. System is typical for (1) unit.

12.2 Inputs:

- a. Space Temperature rm 1 (Adjustable)
- b. Space Temperature rm 2 (Adjustable)
- c. Space Temperature rm 3 (Adjustable)
- d. Space Temperature rm 4 (Adjustable)
- e. Space Temperature rm 5A (Adjustable)
- f. Space Temperature rm 5 North (Adjustable)
- g. Space Temperature rm 5 South (Adjustable)
- h. Space Temperature rm 6 (Adjustable)
- i. Reheat Coil rm 1 Supply Air Temperature
- j. Reheat Coil rm 2 Supply Air Temperature
- k. Reheat Coil rm 3 Supply Air Temperature
- l. Reheat Coil rm 4 Supply Air Temperature
- m. Reheat Coil rm 5A Supply Air Temperature
- n. Reheat Coil rm 5 North Supply Air Temperature
- o. Reheat Coil rm 5 South Supply Air Temperature
- p. Reheat Coil rm 6 Supply Air Temperature

12.3 Outputs:

- a. Reheat Coil rm 1
- b. Reheat Coil rm 2
- c. Reheat Coil rm 3
- d. Reheat Coil rm 4
- e. Reheat Coil rm 5A
- f. Reheat Coil rm 5 North
- g. Reheat Coil rm 5 South
- h. Reheat Coil rm 6

13. MZ – 5 REHEAT COIL CONTROLLER (1 UNIT)

13.1 Scope of Work: Replace existing DDC controls for MZ-5 with new DDC controls. System is typical for (1) unit.

13.2 Inputs:

- a. Space Temperature rm 17 (Adjustable) (AHU 17)

- b. Space Temperature rm 18 (Adjustable) (AHU 17)
- c. Space Temperature rm 19 (Adjustable) (AHU 16)
- d. Space Temperature rm 19C (Adjustable) (AHU 16)
- e. Space Temperature rm 16C (Adjustable) (AHU 16)
- f. Space Temperature rm 16 North (Adjustable) (AHU 16)
- g. Space Temperature rm 16 South (Adjustable) (AHU 16)
- h. Space Temperature rm 16G (Adjustable) (AHU 16)
- i. Reheat Coil rm 17 Supply Air Temperature
- j. Reheat Coil rm 18 Supply Air Temperature
- k. Reheat Coil rm 19 Supply Air Temperature
- l. Reheat Coil rm 19C Supply Air Temperature
- m. Reheat Coil rm 16C Supply Air Temperature
- n. Reheat Coil rm 16 North Supply Air Temperature
- o. Reheat Coil rm 16 South Supply Air Temperature
- p. Reheat Coil rm 16G Supply Air Temperature

13.3 Outputs:

- a. Reheat Coil rm 17
- b. Reheat Coil rm 18
- c. Reheat Coil rm 19
- d. Reheat Coil rm 19C
- e. Reheat Coil rm 16C
- f. Reheat Coil rm 16 North
- g. Reheat Coil rm 16 South
- h. Reheat Coil rm 16G

14. MZ – 6 REHEAT COIL CONTROLLER (1 UNIT)

14.1 Scope of Work: Replace existing DDC controls for MZ-6 with new DDC controls. System is typical for (1) unit.

14.2 Inputs:

- a. Space Temperature rm 7 (Adjustable) (AHU 13)
- b. Space Temperature rm 8 (Adjustable) (AHU 14)
- c. Space Temperature rm 9 (Adjustable) (AHU 14)
- d. Space Temperature rm 10 (Adjustable) (AHU 14)
- e. Space Temperature rm 11 (Adjustable) (AHU 13)
- f. Space Temperature rm 12 North (Adjustable) (AHU 13)
- g. Reheat Coil rm 7 Supply Air Temperature
- h. Reheat Coil rm 8 Supply Air Temperature
- i. Reheat Coil rm 9 Supply Air Temperature
- j. Reheat Coil rm 10 Supply Air Temperature
- k. Reheat Coil rm 11 Supply Air Temperature

l. Reheat Coil rm 12 Supply Air Temperature

14.3 Outputs:

- a. Reheat Coil rm 7
- b. Reheat Coil rm 8
- c. Reheat Coil rm 9
- d. Reheat Coil rm 10
- e. Reheat Coil rm 11
- f. Reheat Coil rm 12

15. MZ – 9 REHEAT COIL CONTROLLER (1 UNIT)

15.1 Scope of Work: Replace existing DDC controls for MZ-9 with new DDC controls. System is typical for (1) unit.

15.2 Inputs:

- a. Space Temperature rm 13 (Adjustable) (AHU 4)
- b. Space Temperature rm 14 (Adjustable) (AHU 4)
- c. Space Temperature rm 15 (Adjustable) (AHU 4)
- d. Reheat Coil rm 13 Supply Air Temperature
- e. Reheat Coil rm 14 Supply Air Temperature
- f. Reheat Coil rm 15 Supply Air Temperature

15.3 Outputs:

- a. Reheat Coil rm 13
- b. Reheat Coil rm 14
- c. Reheat Coil rm 15

16. MZ – 10 REHEAT COIL CONTROLLER (1 UNIT)

16.1 Scope of Work: Replace existing DDC controls for MZ-10 with new DDC controls. System is typical for (1) unit.

16.2 Inputs:

- a. Fire Alarm (AHU 4)
- b. Space Temperature Offices (AHU 4)
- c. Space Temperature First Aid (Adjustable) (AHU 4)
- d. Space Temperature Work Offices Temperature
- e. Space Temperature for space served by unit CUH-26F
- f. CUH 26F Supply Air Temperature

16.3 Outputs:

- a. Reheat Coil rm 15
- b. Reheat Coil rm Office Valve

- c. Reheat Coil rm First Aid Valve
- d. Reheat Coil rm Work Office Valve
- e. CUH 28F Start
- f. CUH 26F Heating Water Coil Valve

17. AH-3 MECHANICAL LOFT B12 (1 UNIT)

17.1 Scope of Work: Replace existing DDC controls for AH-3 with new DDC controls. System is typical for (1) unit.

17.2 Inputs:

- a. Supply Air Temperature
- b. Return Air Temperature
- c. Space Temperature (Adjustable)
- d. Freeze Stat Input
- e. Supply Fan Proof

17.3 Outputs:

- a. Supply Fan Start
- b. Heating Water Coil Valve
- c. Damper Actuator

18. CUH FOYER B11, B9 EF AND CUH – B7 (2 UNITS)

18.1 Scope of Work: Replace existing DDC controls for CUH Foyer B11, B9 EF and CUH – B7 with new DDC controls. System is typical for (2) units.

18.2 Inputs:

- a. Space Temperature (Adjustable)
- b. Space Temperature rm served by radiator B4 (Adjustable)
- c. Supply Fan Proof
- d. Rm B9 EF Proof
- e. Supply Air Temperature CUH
- f. Radiator B4 Supply Air Temperature

18.3 Outputs:

- a. Supply Fan Start
- b. Heating Water Coil Valve CUH
- c. Heating Water Coil Valve Radiator B4
- d. EF in rm B9 Start

19. MZ – 8 CONTROLLER (IN SOUTHWEST ADDITION MECH RM, BOILER NO LONGER OPERATIONAL) (1 UNIT)

19.1 Scope of Work: Replace existing DDC controls for MZ-8 with new DDC controls. The system includes (2) Circ Pumps that are linked into the main buildings hydronic loop. System is typical for (1) unit.

19.2 Inputs:

- a. HC-1 Space Temperature (Adjustable)
- b. DPS Circ. Pump Proof - 1
- c. DPS Circ. Pump Proof – 2
- d. HC-1 Supply Air Temperature

19.3 Outputs:

- a. Circ. Pump – 1 Start
- b. Circ. Pump – 2 Start
- c. HC-1 Heating Water Coil Valve

20. AC – (1-5) CONTROLLER (5 UNIT)

20.1 Scope of Work: Replace existing DDC controls for AC – (1-5) with new DDC controls. System is typical for (5) unit.

20.2 Inputs:

- a. Supply Air Temperature
- b. Space Temperature (Adjustable)
- c. Freeze Stat Input
- d. Supply Fan Proof

20.3 Outputs:

- a. Supply Fan Start
- b. DX Cooling Start
- c. Heating Water Coil Valve
- d. Damper Actuator

AGREEMENT BETWEEN FERNDALE SCHOOL DISTRICT AND CONTRACTOR PUBLIC WORKS CONTRACT

Effective Agreement Date:	___ day of ___, 20__
<u>The Parties to the Agreement are:</u>	
The “School District”	Ferndale School District No. 502 6041 Vista Drive, P.O. Box 698 Ferndale, Washington 98248 Attn: Mark Deebach, Assistant Superintendent, Business and Support Services
The “Contractor”	
Name and General Description of the Project:	
The Architect or Engineer, if any:	
Contract Sum for the Work:	
Payment/Retainage Options: <i>(check one)</i>	<input type="checkbox"/> The School District will retain 10% of the Contract Sum until thirty days after Final Acceptance and as described in RCW 39.08.010(3) (only allowable for projects \$150,000 and less; see RCW 39.08.010(3) for further requirements; if this is selected payment and performance bonds are not required). <input type="checkbox"/> 5% retainage; to be released upon approval of DOR, ESD, and L&I and as otherwise required by statute and this Agreement (required for projects exceeding \$150,000 or if option above not selected; if this is selected payment and performance bonds are required).
Payment and Performance Bond <i>(check one)</i>	<input type="checkbox"/> Required. <input type="checkbox"/> Not required (this box can only be checked if first box is checked under Payment/Retainage Options above)
Date of Substantial Completion of the Work:	
Date of Final Completion of the Work:	10 business days after reaching Substantial Completion
Liquidated Damages: <i>(check one)</i>	<input type="checkbox"/> Not Applicable. <input type="checkbox"/> \$_____ per day
Accepted Alternates, if any:	N/A
Unit Prices, if any:	N/A
Addenda, if any:	

The School District and Contractor agree as set forth below

ARTICLE 1: THE WORK. The Contractor shall fully execute and complete the entire Work described in the Contract Documents, which include:

ARTICLE 2: COMMENCEMENT AND SUBSTANTIAL AND FINAL COMPLETION

2.1 The date of commencement of the Work (the date from which the Contract Time is measured) is the date of this Agreement.

2.2 The Contractor shall achieve Substantial Completion and Final Completion of the entire Work as specified above, subject to adjustments of the Contract Time as provided in the Contract Documents.

ARTICLE 3: THE CONTRACT SUM. The School District shall pay the Contractor the Contract Sum on account of the Contractor's performance of the Agreement, subject to additions and deductions as provided in the Contract Documents.

ARTICLE 4: PAYMENT. The School District will pay the Contractor within thirty days of receipt of Applications for Payment in accordance with the Agreement. The School District will make final payment after Final Completion, within thirty days of receipt of a final Application for Payment, provided that an approved "Statement of Intent to Pay Prevailing Wages," and approved "Affidavit of Wages Paid," and all releases have been submitted. Retention shall be paid per statute.

ARTICLE 5: PERMITS AND FEES

5.1 The Contractor shall prepare documents for, secure, and pay for all necessary permits required for the Work. The School District will secure and pay for only those governmental permits, approvals, fees, licenses, inspections, governmental charges and inspection fees explicitly listed as the School District's responsibility in the Contract Documents.

5.2 The School District shall secure and pay for approvals, easements, assessments, and charges required for the use or occupancy of permanent structures or permanent changes in existing facilities.

ARTICLE 6: ENUMERATION OF CONTRACT DOCUMENTS. The Contract Documents include this executed Agreement, including the attached General Conditions, any Supplemental and other Conditions of the Agreement, the Specifications, the Drawings, any Addenda, and the prevailing wage rates. In the event of a conflict or discrepancy among or in the Contract Documents, interpretation shall be governed in the following order of priority:

1. Agreement
2. General Conditions
3. Scope of Work
4. Drawings and Specifications
5. Site Conditions and Coordination
6. Supplemental Conditions

FERNDAL SCHOOL DISTRICT No. 502

CONTRACTOR

By _____
(Signature)

By _____
(Signature)

(Printed name and title)

(Printed name and title)

GENERAL CONDITIONS

ARTICLE 7 **THE CONTRACT DOCUMENTS**

7.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contractor's performance is required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the intended results.

7.2 "Work" means the construction and services required by the Contract Documents and includes all labor, materials, equipment, and services to be provided by the Contractor to fulfill the Contractor's obligations.

ARTICLE 8 **ADMINISTRATION OF THE AGREEMENT**

8.1 The School District will provide administration of the Agreement. School District representatives are not authorized to revoke, alter, relax, or release any requirements of the Contract Documents, to issue instructions contrary to the Contract Documents, or to approve or accept any portion of the Work not executed in accordance with the Contract Documents.

8.2 The School District may reject Work that, in its opinion, does not conform to the Contract Documents.

8.3 The School District may visit the site at intervals it considers appropriate to the stage of the Work to become generally familiar with the progress and quality of the completed Work.

ARTICLE 9 **THE CONTRACTOR**

9.1 Using its best skill and attention, the Contractor shall perform, supervise and direct the Work. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures and personnel, for safety, and for coordinating all portions of the Work under the Agreement. The Contractor shall provide and pay for all labor, materials, equipment, tools and machinery, transportation, and other facilities and services necessary for the proper execution and completion of the Work.

9.2 Subcontractors. A "Subcontractor" is a person or entity that has a direct contract with the Contractor to perform a portion of the Work at the Site or to supply materials or equipment. A "Subcontractor of any tier" includes Subcontractors and all lower-level subcontractors and suppliers. As soon as practicable and no later than *five days* after award of the Agreement, the Contractor shall confirm in writing to the School District the names of the Subcontractors for each portion of the Work.

9.3 Compliance with Law. The Contractor, its employees, Subcontractors, and representatives, shall comply with all applicable laws, ordinances, statutes, rules and regulations, federal and state, county and municipal, and particularly those relating to wages, hours, fair employment practices, non-discrimination, safety and working conditions.

9.3.1 Prevailing Wages. Pursuant to RCW 39.12, no worker, laborer, or mechanic shall be paid less than the "prevailing rate of wage" in effect on the Proposal Date.

9.3.2 Hours of Labor. The Contractor shall comply with all applicable provisions of RCW 49.28.

9.3.3 Workers' Right to Know. The Contractor shall comply with RCW 49.70 and WAC 296-62-054 regarding workplace surveys and material safety data sheets for "hazardous" chemicals at the Site.

9.4 Workers. The Contractor shall enforce strict discipline and good order among persons carrying out the Work and shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. A person shall be unfit and removed from the Work who has been found guilty of any felony crime as specified in RCW 28A.400.330, generally regarding crimes against children.

9.5 Warranty. The Contractor warrants that materials and equipment furnished under the Agreement will be of good quality and new, that the Work will be performed in a skillful and workmanlike manner, free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents.

9.6 Submittals. The Contractor shall review, approve and submit to the School District with reasonable promptness Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents. The Work shall be in accordance with approved submittals.

9.7 Progress Schedule. Within *five days* of execution of this Agreement, the Contractor shall submit a schedule of the Work to the School District.

9.8 Clean-Up. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials caused by operations under the Agreement.

9.9 Indemnification. Subject to the following conditions, the Contractor shall defend, indemnify, and hold harmless the School District, any listed Architect or Engineer, and their respective agents, employees, consultants, successors and assigns (“Indemnified Parties”) from and against all claims, damages, losses and expenses, direct and indirect, or consequential, including costs and attorneys’ fees incurred on such claims and in proving the right to indemnification, arising out of or resulting from any act or omission of the Contractor, its agents, any of its Subcontractors of any tier, and anyone directly or indirectly employed by the Contractor or Subcontractors of any tier (“Indemnitor”). The Contractor will fully indemnify the Indemnified Parties for the sole negligence of the Indemnitor. The Contractor will indemnify the Indemnified Parties for the concurrent negligence of the Indemnitor to the extent of the Indemnitor’s negligence. The Contractor has not duty to indemnify the Indemnified Parties for the sole negligence of the Indemnified Parties. The Contractor agrees to being added by the School District as a party to any arbitration or litigation with third parties in which the School District alleges indemnification or contribution from an Indemnitor. The Contractor agrees that all of its Subcontractors of any tier will, in the subcontracts, similarly stipulate; in the event any does not, the Contractor shall be liable in place of such Subcontractor(s). PROVIDED FURTHER that the Contractor agrees to waive its immunity under the Washington State Industrial Act (Title 51 RCW) as to the Indemnified Parties only. To the extent a court or arbitrator strikes any portion of this indemnification provision for any reason, all remaining provisions shall retain their vitality and effect.

9.10 Records. The Contractor shall maintain and preserve books, ledgers, records, estimates, correspondence, logs, schedules, electronic data, and other documents relating or pertaining to the costs and/or performance of the Agreement (“records”). Within *seven days* of the School District’s request, the Contractor shall make available at the Contractor’s office all records for inspection, audit and reproduction (including electronic reproduction) by the School District’s representatives. These requirements apply to each Subcontractor of any tier. The Contractor agrees, on behalf of itself and Subcontractors of any tier, that the invocation of any rights under RCW 42.56 shall initiate an

equivalent right to disclosures from the Contractor and Subcontractors of any tier for the benefit of the School District.

ARTICLE 10 **CONSTRUCTION NOT BY THE CONTRACTOR**

10.1 The School District may perform construction or operations related to the Project with its own forces and to award separate contracts in connection with other portions of the Project.

10.2 The Contractor shall afford the School District and separate contractors’ reasonable opportunity for the introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor’s construction and operations as required by the Contract Documents.

ARTICLE 11 **CHANGES IN THE WORK**

11.1 The School District, without invalidating the Agreement, may order changes in the Work consisting of additions, deletions, or modifications (“Changes”), and the Contract Sum and Contract Time will be adjusted accordingly. Changes in the Work, the Contract Sum and/or the Contract Time shall be authorized only in writing, through a Change Order or a Construction Change Directive.

11.1.1 Change Orders. A Change Order is a written instrument signed by the School District and the Contractor stating their agreement upon a change in the Work, the amount of any adjustment in the Contract Sum, and the extent of any adjustment in the Contract Time.

11.1.2 Construction Change Directives. A Construction Change Directive is a written order prepared and signed by the School District that directs a change in the Work and states a proposed basis for any adjustment in the Contract Sum and/or Contract Time. It is used in the absence of total agreement on the terms of a Change Order. The Contractor shall promptly proceed with the change in the Work described in the Construction Change Directive. As soon as possible, and within *seven days* of receipt, the Contractor shall advise the School District in writing of the Contractor’s agreement or disagreement with the cost or the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

11.2 If the parties cannot agree on the cost or credit to the School District from a Change in the Work, the Contractor shall keep and present an itemized accounting with supporting data. The total cost of any Change or Claim

shall be limited to the reasonable value of the direct labor costs, material costs, construction equipment usage costs for the actual time equipment appropriate for the Work is used solely on the Change in the Work, the cost of any change in insurance. Subcontractor costs, and a Fee for all combined overhead and profit, including impact costs of any kind, limited to 15% of the cost for any materials or work performed by a Contractor's or Subcontractor's own forces, and 8% on amounts due to lower tier Subcontractors

11.3 Claims for Concealed or Unknown Conditions.

If conditions unknown to the Contractor are encountered at the site that are (1) concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found and generally recognized as inherent in activities of the character provided for in the Contract Documents, then the Contractor shall give written notice to the School District promptly before conditions are disturbed and in no event later than *seven days* after the first observance on the conditions. Any Claim arising from such condition shall be made in accordance with the dispute resolution procedures of Article 19.

ARTICLE 12 **TIME**

12.1 If, through no fault of the Contractor or a Subcontractor of any tier, the Work is delayed by changes ordered in the Work, unanticipated general labor disputes, fire, unforeseeable delay in deliveries, abnormal adverse weather conditions not reasonably anticipatable, unavoidable casualties or any other causes beyond the Contractor's control, then the Contract Time shall be extended by Change Order to the extent the critical path is affected. The Contractor is entitled to damages for delay only if the School District's actions or inactions were the actual, substantial cause of the delay and if the Contractor could not have reasonably avoided the delay by the exercise of due diligence. The Contractor is not entitled to an increase in the Contract Time or Contract Sum if a delay was caused by the Contractor, a Subcontractor of any tier, or anyone acting on behalf of any of them.

12.2 The timely completion of this Project is essential to the School District. The School District will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time; however, it may be difficult if not impossible to determine the amount of such damages. Consequently, the Agreement may include provisions for liquidated damages, which are not affected by partial completion, occupancy, or beneficial

occupancy. If this Agreement does not include liquidated damages, then the School District may pursue its actual damages resulting from delay.

ARTICLE 13 **PAYMENTS AND COMPLETION**

13.1 Payments. Payment shall be made as provided in this Agreement. If progress payments are specified, they will be made as specified in the Specifications Section, Application for Payment, and, pursuant to RCW 60.28, the School District will reserve 5% from the moneys the Contractor earns on estimates during the progress of the Work, to be retained as a trust fund for the protection and payment of the claims of any person arising under the Agreement and the state with respect to taxes imposed pursuant to Title 82 RCW that may be due from the Contractor. The moneys reserved may, at the option of the Contractor, be (1) retained in a fund by the School District until *forty-five days* following Final Acceptance; or (2) deposited by the School District in an interest-bearing account in a bank, mutual savings bank, or savings and loan association, not subject to withdrawal until *forty-five days* following Final Acceptance, with interest to the Contractor; or (3) placed in escrow with a bank or trust company until *forty-five days* following the Final Acceptance, by the School District's joint check to the bank or trust company and the Contractor, to be converted into bonds and securities chosen by the Contractor, approved by the School District, and held in escrow, with interest on the bonds and securities paid to the Contractor as it accrues. If moneys are retained from the Contractor, it may retain payment of not more than 5% from the moneys earned by any Subcontractor, provided that the Contractor pays interest to the Subcontractor at the same interest rate it receives from its reserved funds.

13.2 Prevailing Wages. The Contractor shall comply with all applicable provisions of RCW 39.12, including but not limited to submission of approved "Statements of Intent to Pay Prevailing Wage," payment of all L&I fees, submission and posting of approved "Statements of Intent to Pay Prevailing Wages" and payment of prevailing wages.

13.3 Withheld Payment. Payment may be withheld on account of (1) defective Work not remedied, (2) claims filed by third parties, (3) failure of the Contractor to make payments properly for labor, materials or equipment, (4) damage to the School District or another contractor, (5) reasonable evidence that the unpaid balance would not be adequate to cover delay damages for which the Contractor is responsible, (6) failure to carry out the Work in accordance with the Contract Documents, or (7) liquidated damages.

13.4 Substantial Completion.

13.4.1 When the Contractor believes that the Work is Substantially Complete, it shall notify the School District in writing. When the School District agrees, it will issue a Certificate of Substantial Completion. Substantial Completion is the stage in the progress of the Work when the construction is sufficiently complete, in accordance with the Contract Documents, so the School District can fully utilize the Work (or a designated portion) for its intended use. All Work other than incidental corrective or punch list work and final cleaning shall have been completed. The Work is not Substantially Complete if all systems and parts affected by the Work are not usable. The fact that the School District may use or occupy the Work or designated portion thereof does not indicate that the Work is Substantially Complete, nor does such occupation toll or change any liquidated damages due the School District.

13.4.2 Immediately before any occupancy, the School District will schedule an inspection tour of the area to be occupied. Representatives of the School District and Contractor will jointly tour the area and record items still remaining to be finished or corrected. The Contractor shall supply and install any items missed by the inspection but required or necessary for Final Completion as a part of the Contract Sum.

13.5 Final Payment. Pursuant to RCW 60.28, completion of the contract Work shall occur, and final payment shall become due after the Contractor has been notified that the Work has been concluded and submits the items listed below to the School District, any required occupancy permit has been issued and the School District's Board of Directors formally accepts the Project.

.1 An affidavit that all payrolls, Subcontractors, bills for materials and equipment, and other indebtedness connected with the Work for which the School District might be responsible or encumbered, have been paid or otherwise satisfied.

.2 A certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least *thirty days'* prior written notice has been given to the School District.

.3 Other data establishing payment or satisfaction of or protection (satisfactory to the School District) against all obligations, such as receipts, releases and waivers of liens arising out of the Agreement, satisfactorily demonstrating to the School District that the claims of Subcontractors and laborers who have filed claims have been paid.

.4 Pursuant to RCW 39.12.040, required "Affidavits

of Wages Paid."

.5 Pursuant to RCW 50.24, a certificate from the Department of Employment Security. A certified statement that the Contractor has closed all necessary permits or otherwise met the requirements of all governing jurisdictions related to this Project.

.6 All warranties, guarantees, certificates, spare parts, specified excess material, and other documents or items required by the Contract Documents.

.7 A legible hard copy of the as-built drawings.

.8 Original permits and permit documents.

If any Subcontractor of any tier refuses to furnish a release or waiver required by the School District, the School District may retain such amount as to defray the cost of foreclosing the liens of such claims and to pay attorneys' fees, the total of which shall be no less than 150% of the claimed amount. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the School District all moneys that the School District may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

13.6 Waivers.

13.6.1 Final Payment by School District. The making of final payment shall constitute a waiver of claims by the School District except those arising from (1) claims or encumbrances arising out of the Agreement and unsettled; (2) failure of the Work to comply with the requirements of the Contract Documents; or (3) terms of warranties required by the Contract Documents or law.

13.6.2 Final Payment to Contractor. Acceptance of final payment by the Contractor shall constitute a waiver of Claims except those previously made in writing and identified in writing as unsettled on the final Application for Payment.

13.6.3 Change Orders. The execution of a Change Order shall constitute a waiver of Claims by the Contractor arising out of the Work to be performed or deleted pursuant to the Change Order, except as specifically described in the Change Order. If the Contractor adds a reservation of rights that has not been initialed by the School District, any amounts previously agreed to shall be considered disputed and not payable.

13.7 Warranty of Title. The Contractor warrants and guarantees that title to Work, materials and equipment covered by payment, whether incorporated in the Project or not, will pass to the School District no later than the time of payment, free and clear of liens.

ARTICLE 14
PROTECTION OF PERSONS AND PROPERTY

14.1 The Contractor shall have the right to control and shall be solely responsible, and the School District shall not have responsibility, for all aspects of safety. The Contractor shall take reasonable precautions for safety on site, and shall provide reasonable protection to prevent damage, injury or loss.

14.2 The Contractor shall not be required to perform Work relating to asbestos or polychlorinated biphenyl ("PCB"), unless identified as the Contractor's responsibility in the Contract Documents.

ARTICLE 15
INSURANCE AND BONDS

15.1 Contractor's Liability Insurance. The Contractor shall purchase from and maintain during the life of this Agreement, at its own cost in a company or companies admitted to do business in the State of Washington possessing a Best's policyholder's rating of A- or better and a financial rating of no less than VIII, and reasonably acceptable to the School District, an occurrence-based Commercial General Liability Insurance Policy and such other insurance as will provide protection from claims set forth below which may arise out of or result from Contractor's operations under the Contract Documents, whether to be performed or furnished by Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

15.1.1 Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts, including Contingent Employers Liability (Stop Gap).

15.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees.

15.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.

15.1.4 Claims for damages insured by personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or (b) by any other person for any other reason;

15.1.5 Claims for damages, other than to the

Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

15.1.6 Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property. This coverage will include claims by third parties, including School District for bodily injury, sickness or disease, property damage and/or clean-up caused by the abatement of materials deemed to be hazardous materials by State and Federal authorities. The scope of insurance coverage shall encompass the abatement of lead paint and asbestos as well as any other hazardous materials.

15.1.7 Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle, including coverage for Owned Motor Vehicles, Non-Owned Motor Vehicles and Hired or Borrowed Motor Vehicles. Coverage shall also cover the clean-up of pollutants caused by the up-set or overturn of vehicles carrying hazardous materials; and

15.1.8 The School District shall be named as an additional insured on such policies other than State Workers Compensation. The School District's specification or approval of this insurance or of its amount shall not relieve or decrease the liability of the Contractor under the Contract Documents or otherwise. Policies shall contain a provision that the School District shall be given *thirty days'* written notice by certified mail before cancellation of any insurance or reduction of the amount thereof, or any alteration, modification, or restriction thereto.

15.1.9 The comprehensive general liability insurance required by this section must include contractual liability insurance applicable to Contractor's obligations under Section 12.12.

15.2 Insurance Amounts. The insurance required by these General Conditions shall be written on an occurrence basis, for not less than the following (or greater if required by law):

- .1. Worker's Compensation
 - (a) State: Statutory
 - (b) Employer's Liability: \$1,000,000
 - (c) Washington Stop Gap
- .2. Comprehensive General Liability (including Premises-Operations; Independent Contractor's Protective; Products and Completed Operations; Broad-Form Property Damage):
 - (a) Bodily Injury; Property Damage; Combined Single Limit: \$1,000,000 each Occurrence and \$1,000,000 general aggregate

(b) Products and Completed Operations of \$1,000,000 to be maintained for two years after final payment.

(c) The coverages required above shall have a deductible or self-insured retention of no greater than \$10,000.

15.3 Property Insurance. The School District shall insure the property in the amount of its insurable replacement cost, including additions and alterations, against "all risks" of physical loss. The policies shall inure to the benefit of the School District only. Upon the occurrence of an insured loss, the School District shall have the power to adjust and settle any loss with the insurers. The Contractor shall bear the risk of any loss, damage or destruction to its own property to the extent that it will not be incorporated in the Work, including but not limited to loss from theft or vandalism. Any insurance provided by the School District will not cover any such loss, damage or destruction.

15.4 Payment and Performance Bond. If the Contractor is required to secure a payment and performance bond (see cover page), it shall be in the amount of the Contract Sum plus sales tax and shall comply with RCW 39.08 in a form and with a surety approved by the School District.

ARTICLE 16

CORRECTION OF WORK

16.1 The Contractor shall promptly correct Work rejected or failing to conform to the requirements of the Contract Documents at any time through a period of one year from the date of Substantial Completion of the Agreement or by terms of a longer manufacturer's warranty or an applicable special warranty required by the Contract Documents.

16.2 If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents or fails to carry out the Work in accordance with the Contract Documents, the School District, by a written order, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

16.3 Nothing in this Article shall establish a period of limitation with respect to other obligations that the Contractor might have under the Contract Documents.

ARTICLE 17

MISCELLANEOUS PROVISIONS

17.1 The Agreement shall be governed by the

internal law of Washington, without regard to its choice-of-law provisions. Exclusive venue for any litigation shall be in Superior Court in the county in which the Project is located.

17.2 The Contractor shall give notices and comply with applicable laws, rules, regulations and orders of public authorities, including but not limited to RCW 39.06 and RCW 18.27 (Registration), RCW 49.60 (Discrimination), RCW 70.92 (Aged and Handicapped Persons), WAC 296-155 (Safety Standards), RCW 50.24 (Unemployment Compensation), Drug-Free Workplace Act of 1988 (Drug-Free Workplace), RCW 9A.1.280 (Weapons), and RCW 49.26 (any asbestos removal). Smoking or use of any kind of lighted smoking equipment, material or smokeless tobacco products is prohibited on all School District property.

17.3 Neither the Contractor nor any of its Subcontractors of any tier shall utilize any employee who is a registered sex offender or has pled guilty to or been convicted of any felony crime involving the physical neglect of a child under Chapter 9A.42 RCW, the physical injury or death of a child under Chapter 9A.32 RCW or Chapter 9A.36 RCW (except motor vehicle violations under Chapter 46.61 RCW), sexual exploitation of a child under Chapter 9A.68A RCW, sexual offenses under Chapter 9A.44 RCW where a minor is a victim, promoting prostitution of a minor under Chapter 9A.88 RCW, the sale or purchase of a minor child under Chapter 9A.64.030 RCW, or violation of similar laws of another jurisdiction. The Contractor shall remove from the Project any employee or other person who has engaged in such actions or who the School District reasonably considers objectionable at no cost to the School District. Failure to comply with these requirements is grounds for immediate termination of the Agreement for cause.

ARTICLE 18

TERMINATION OF THE CONTRACT

18.1 Termination for Cause by Contractor. If the School District fails to make payment for a period of *sixty days* through no fault of the Contractor, the Contractor may, upon *seven additional days'* written notice, terminate the Agreement and recover from the School District payment for all Work executed, in accordance with the Agreement.

18.2 Termination for Cause by School District. The School District may, upon *seven days'* written notice to the Contractor, terminate without prejudice the whole or any portion of the Work for cause, including but not limited to the Contractor's material breach of this Agreement; the Contractor's failure to prosecute the Work or any portion

thereof with sufficient diligence to ensure the Substantial Completion of the Work within the Contract Time; the Contractor's material disregard of laws, ordinances, rules, regulations or orders of any public authority having jurisdiction; the Contractor's being adjudged bankrupt, making a general assignment for the benefit of its creditors, a receiver being appointed on account of the Contractor's insolvency; or the Contractor's failure to comply with RCW 28A.400.330 (generally, a worker having contact with children who has been found guilty of a felony crime involving children).

18.3 Termination for Convenience by School District.

The School District may, at any time upon *ten days'* written notice to the Contractor, terminate without prejudice the whole or any portion of the Work for the convenience of the School District. The School District shall be liable to Contractor only for (1) the amount due under this Agreement for the Work properly performed prior to the termination and (2) other pre-approved costs, consistent with Paragraph 11.2, necessary and reasonably incurred in connection with the termination.

18.4 Effects of Termination.

18.4.1 The total sum to be paid to the Contractor under this Article shall not exceed the Contract Sum as reduced by the amount of payments otherwise made.

18.4.2 Unless the School District directs otherwise, after receipt of a Notice of Termination by the School District, the Contractor shall: promptly stop Work as specified in the Notice of Termination; place no further orders or subcontracts, except as necessary for completion of non-terminated Work; procure cancellation of all orders and subcontracts to the extent related to the performance of terminated Work; assign to the School District all of its right, title and interest under all orders and subcontracts; with the School District's approval, settle outstanding liabilities and claims arising out of the termination of orders and subcontracts not assigned to the School District; transfer title and deliver to the entity or entities designated by the School District the fabricated or un-fabricated parts, Work in process or completed, partially completed supplies and equipment, materials, tools, dies, jigs and other fixtures, supplies and other material produced as part of, or acquired in connection with the performance of, the Work terminated, and the completed or partially completed plans, drawings, information and other property related to the Work; take such action as may be necessary or directed by the School District to preserve and protect the Work and property related to this Project in the possession of the Contractor in which the School District has an interest; and continue performance only to the extent not terminated.

18.4.3 The damages and relief from termination under this Paragraph 18.4 shall be the Contractor's sole entitlement in the event of termination.

ARTICLE 19 **DISPUTE RESOLUTION**

19.1 All claims, disputes and other matters in question of the Contractor arising out of, or relating to, the Contract Documents or the breach thereof ("Claims") shall be decided exclusively by the following dispute resolution procedure. The Contractor shall diligently carry on the Work and maintain the progress schedule during the dispute resolution procedure, unless the parties mutually agree in writing otherwise.]

19.2 Notice of Claim. The Contractor shall submit notice of all Claims to the School District in writing within *seven days* of the event giving rise to them.

19.3 Claim Submission. Within *fourteen days* of the event giving rise to the Claim, the Contractor shall provide the School District with a written Claim that includes a clear description of the Claim, all changes sought in cost and in time, and data supporting the Claim. Failure to timely file either the Notice of Claim to the Claim itself shall constitute a waiver of the Contractor's right to pursue the Claim.

19.4 Mediation. The Contractor may bring no Claim against the School District unless the Claim is first subject to mediation under the Construction Mediation Rules of the American Arbitration Association ("AAA"). To initiate the mediation process, the Contractor shall submit a written mediation request to the School District. If the parties are unable to agree upon a mediator within *thirty days* after the School District's receipt of the written request for mediation, either party may submit a request for mediation to the AAA. Other parties in interest, such as Subcontractors, shall also attend the mediation session. All unresolved Claims in the Project shall be considered at a single mediation session that shall occur prior to Final Acceptance by the School District.

19.5 Litigation. The Contractor may not bring litigation on a Claim unless it has been properly addressed in the above dispute resolution procedure. Litigation must be filed within *120 days* after the Date of Substantial Completion. The pendency of mediation shall toll these filing requirements.