

To: All Plan Holders & Bidding Contractors
From: Integrity Construction Services, LLC. (Construction Manager)
Date: September 25, 2017
Re: Otsego County Library Expansion

Addendum No. 2

This addendum is being issued for the purpose of modifying and/or clarifying the original Bidding Documents and shall take precedence over them.

All work included herein shall be in accordance with the general requirements of the original bidding documents, except as specifically noted herein.

This addendum is being sent to all known plan holders, suppliers, plan rooms, and governmental agencies having Bidding Documents.

BID SCOPE CLARIFICATIONS:

None

ARCHITECTURAL – CIVIL - MEP ITEMS:

See Addendum No. 2 dated September 25, 2017 from Sidock Group (12 pages)

Attachments:

- Building Management System Specification
- Sheet M-201

757 S. WISCONSIN AVENUE • GAYLORD MI 49735
phone 989.705.8400 • fax 989.705.8403

Addendum Number: 2
Date: September 25, 2017
Project Name: Otsego County Library Expansion
SG Project Number: 515747
Proposal Date: Unchanged

This Addendum is being issued for the purpose of clarifying and/or modifying the original Bidding Documents and shall take precedence over them. Each Bidder's proposal shall include the Work described herein. All requirements contained in the Contract Documents shall apply to this Addendum. All incidental work necessary to complete the Work shall be included in the Contractor's quotation even though not particularly mentioned. Parts of the Specifications and Drawings referred to herein supersede previously issued data and form a part of this Addendum.

CLARIFICATIONS:

1.

ATTACHMENTS:

The following documents are a part of this Addendum:

1. Reference Sheet M-201, Duct Smoke Detectors shall be installed in the return ductwork of RTU-1 and RTU-2, as indicated on the drawing.
2. Reference Sheet M-901, The following items shall be furnished with RTU-1 and RTU-2:
 - a. Duct Smoke Detectors for return duct.
 - b. Economizer
 - c. OA Control with CO2 Override, fully modulating actuator, and Enthalpy Limit.
 - d. 115V Convenience Outlet, factory wired.
 - e. Supply air blower with premium efficiency motor and VFD
 - f. 2" Pre-Filters and 4" MERV 13 Unit Filters
 - g. Hot Gas Bypass
 - h. Non-Fused Disconnect Switch
 - i. VAV Unit Controller, VAV cool plus CV Heat
 - j. Unit to be furnished DDC ready. Controls by Temperature Control Contractor.
 - k. DDC Control System shall be based on ControlNET LLC
3. Reference the Attached Building Management System Specification. Building Management System shall be based on ControlNET LLC.
4. Reference Sheet M-901. Controllers shall be furnished with all VAV boxes.
5. Reference Sheet M-901. Exhaust Fans shall be controlled by light switches.

BUILDING MANAGEMENT SYSTEM SPECIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Building Management System (BMS), utilizing direct digital controls.

1.2 SYSTEM DESCRIPTION

- A. Scope: Furnish all labor, materials and equipment necessary for a complete and operating Building Management System (BMS), utilizing Direct Digital Controls as shown on the drawings and schedules, and as described herein. All controllers furnished in this section shall communicate on a peer-to-peer bus over a LonWorks open protocol bus.
 - 1. The intent of this specification is to provide an extension of the existing ControlNET BMS system that is installed throughout the owner's facilities running the Niagara 4 Framework. The existing Niagara AX system and all associated Network Area Controllers shall be upgraded to accommodate the new Niagara 4 Web Supervisor system to be installed to function as a singular Niagara 4 BMS.
 - 2. System architecture shall fully support a multi-vendor environment and be able to integrate third party systems via existing vendor protocols including, as a minimum, LonTalk, BACnet and MODBUS.
 - 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.
 - 4. All equipment direct digital controllers shall be furnished, installed and programmed by the controls contractor for the following equipment:
 - a. Roof Top Units
 - 1) Room temperature
 - 2) Room temperature set point adjustment
 - 3) Room temperature sensor bypass mode button status
 - 4) Unit supply air temperature
 - 5) Unit fan status
 - 6) Supply Fan enable/disable
 - 7) Heating stage 1 enable/disable
 - 8) Heating stage 2 enable/disable (if applicable)
 - 9) Cooling stage 1 enable/disable
 - 10) Cooling stage 2 enable/disable (if applicable)
 - 11) Outdoor air damper signal (0-10vdc or 2-10vdc actuator to be provided with RTU)
 - 12) Unoccupied cooling
 - 13) Occupied cooling
 - 14) Occupied heating
 - 15) Unoccupied heating
 - 16) Economizer outdoor temperature lockout
 - 17) Minimum outdoor air damper position (occupied mode only)
 - b. Exhaust Fans
 - 1) Unit fan status
 - 2) Supply Fan enable/disable

1.3 QUALITY ASSURANCE

- A. The Direct Digital Control System shall be based on ControlNET LLC; all others in strict compliance with the specification shall bid as voluntary alternates only.

- B. The successful bidder shall have a minimum of five Tridium Niagara N4 Certified engineers that have successfully completed a software programming program accredited by the BMS system manufacturer. Copies of actual certificates may be requested and must be supplied within 24 hours of the request.
- C. The use of subcontractors for any programming, system setup and graphic creation, not in the direct employ of the bidding contractor shall not be permitted.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer / Installer: Honeywell WEBs N4, Honeywell Spyder, Honeywell Stryker and Smart Controls fully programmable controllers as installed by ControlNET, LLC.
- B. Closed, proprietary or systems not made available to the open market and their products are not acceptable.

2.2 GENERAL

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

2.3 OPEN, INTEROPERABLE, INTEGRATED ARCHITECTURE

- A. The intent of this specification is to provide a peer-to-peer networked, stand-alone, distributed control system utilizing Open protocols in one open, interoperable system.
- B. All components and controllers supplied under this contract shall be true "peer-to-peer" communicating devices. Components or controllers requiring "polling" by a host to pass data shall not be acceptable.
- C. The supplied system shall incorporate the ability to access all data using HTML5 enabled browsers without requiring proprietary operator interface and configuration programs or browser plug-ins. An Open Database Connectivity (ODBC) or Structured Query Language (SQL) compliant server database is required for all system database parameter storage. This data shall reside on the Operating System Server located in the Facilities Office on the LAN. Systems requiring proprietary database and user interface programs shall not be acceptable.

2.4 BAS SERVER & WEB BROWSER GUI - SYSTEM OVERVIEW

- A. 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.
- B. 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.

- C. The BAS server software shall support at least the following server platforms (Windows 7, 8.1, Server 12). The BAS server software shall be developed and tested by the manufacturer of the system stand-alone controllers and network controllers/routers.
- D. 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:
 - 1. Trending.
 - 2. Scheduling.
 - 3. Electrical demand limiting.
 - 4. Duty Cycling.
 - 5. Downloading Memory to field devices.
 - 6. Real time 'live' Graphic Programs.
 - 7. Tree Navigation.
 - 8. Parameter change of properties.
 - 9. Set point adjustments.
 - 10. Alarm / event information.
 - 11. Configuration of operators.
 - 12. Execution of global commands.
 - 13. Add, delete, and modify graphics and displayed data.
- E. 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:
 - 1. Server Software, Database and Web Browser Graphical User Interface.
 - 2. 5 Year Software Maintenance license. Labor to implement not included.
 - 3. Embedded System Configuration Utilities for future modifications to the system and controllers.
 - 4. Embedded Graphical Programming Tools.
 - 5. Embedded Direct Digital Control software.
 - 6. Embedded Application Software.
- F. 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.
- G. Thin Client - Web Browser Based: The GUI shall be thin client or browser based and shall meet the following criteria:
 - 1. Web Browsers for PCs: 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.
 - 2. Secure Sockets Layer: Communication between the Web Browser GUI and BAS server shall offer encryption using 128-bit encryption technology within Secure Sockets Layer (SSL). Communication protocol shall be Hyper-Text Transfer Protocol Secure (HTTPS).

2.5 WEB BROWSER GRAPHICAL USER INTERFACE

- A. 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/touchscreen/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, configuration menus for operator access, reports and reporting actions for events.

- B. Mobile Web Browser Navigation through Smart Phones and Tablets: In order to assure comprehensive mobile navigation with all major browsers to include Safari and Firefox, navigation shall be done through the use of a touch-friendly dynamic navigation bar. Right-click commands are not compatible with most mobile/touch devices, so all equipment commands shall utilize touch-compatible buttons. The contents of the dynamic navigation bar shall be customized to match the specific requirements of each building, while retaining the same general categories for consistency and ease of use.
1. The buttons of the dynamic navigation bar shall be adaptive, changing hyperlink connections relevant to each system type, allowing hyperlinks, specific to the selected system to be added as requested by the consulting engineer.
 2. The dynamic navigation bar at the top of each BMS page will be provided and have the following links/functions:
 - a. Home: A link that takes the user to a main entry point of navigation at a building or district level.
 - b. Main Systems Icons/Buttons: Links to general systems like HVAC, Lights, and Card Access are indicated by icon buttons. Links to major systems and equipment such Hydronic Systems or Air Handlers are listed in descriptive buttons.
 - c. Floor Plans: Links to floor plan sections are shown as graphic outline keys with descriptive buttons. Visual indicators highlight the part of the building that is relevant to the user's navigation (i.e. the section in which the currently viewed VAV box resides).
 - d. Alarm Console: A table that shows all points that are in an alarm state and allowing users to silence or acknowledge alarms from the alarm console. The dynamic navigation bar will show the total number of unacknowledged alarms without having to go to the Alarm Console page.
 - e. Schedules: An at-a-glance schedule page that shows equipment schedule periods. The at-a-glance page allows users to change occupancy times with a weekly or calendar scheduler with a single click.
 - f. Information: A page with links to pertinent documents, including a BMS User's Guide. This page will provide legends/keys that define status colors and icons. This page will also serve as the landing page for links to the following feature pages, if they are not directly linkable from the dynamic navigation bar:
 1. Weather: A page that shows current local weather conditions in a seven-day forecast.
 2. Alarm History: A log of previous alarms that features sorting and time range filters.
 3. Audit Log: A log of users who have accessed the BMS. It records changes made by users and features sorting and time range filters.
 4. Chart Builder: A tool that allows charts to be made comparing historical data. It allows custom-built chart data to be exported as an Excel or .PDF file.
 5. Override Summary: A table of all equipment with a manual override status.
 6. User Configuration: A page that allows users to change log-in and profile information. Users with administrative rights may add or delete users to the BMS.
 7. Custom Dashboard: A page with customizable charts and gauges which can be saved independently for each operator.
 8. Email Configuration: A page that will allow administrators to set up email notification specifics for operators regarding alarms.
 9. User Configuration: A page that will allow administrators to add, delete, and edit the properties of users for the BAS.
 - g. Log-Out: Pressing this button will log the current user out of the BMS and return the browser to the log-in screen.

- h. Navigational Info Fields: This feature provides information to the user by displaying the building name, current page name, current page description, outside air temperature, current date, and current time. The current page description is editable by the user from the graphic.
- C. Critical Data Display: The dynamic navigation bar may also display a critical data summary
- D. 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.
- E. Graphics Pane: The Graphics Pane shall provide several functional views for each subsystem specified. A functional view shall be accessed by clicking on the corresponding button:
 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.
 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. See Section 2.13 below.
 3. Schedules: Shall be used to create, modify/edit and view schedules based on the systems hierarchy (using the dynamic navigation bar).
 4. Alarms: Shall be used to view alarm information geographically (using the dynamic navigation bar), acknowledge alarms, sort alarms by category, actions and verify reporting actions.
 5. 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.
 6. Global Set Points page: This page is used to monitor and set global commands that affect multiple systems/equipment. (For example, all finned tube valves in the building would have a global minimum valve position set point and corresponding outside air temperature set point).
 7. Preventative Maintenance Schedules page: This page is used to set and track runtimes for mechanical equipment. Alerts shall be sent to the Alarm Console when the runtime reaches the allocated time to notify operators that preventative maintenance is required. These runtime limits should be operator adjustable.
 8. 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.
- F. Color Graphics: The Web Browser GUI shall make extensive use of color in the Graphics Pane to communicate information related to set points and comfort. Animated .gifs, .pngs, scalable vector graphics, and 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:
 1. General Graphic: General area maps shall show locations of controlled buildings in relation to local landmarks.
 2. Color Floor Plans: Floor plan graphics shall show heating and cooling zones throughout the buildings in a range of colors, as selected by Owner. The room temperature label colors shall be updated dynamically as a zone's actual comfort condition changes to give an at-a-glance realization of temperatures to the operator.

3. 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.
 4. Minimum System Color Graphics: Color graphics shall be selected and displayed via a web browser for the following:
 - a. Each piece of equipment monitored or controlled including each terminal unit.
 - b. Each building.
 - c. Each floor and zone controlled.
- G. Alarms: Alarms associated with a specific system, area, or equipment selected in the Navigation Tree, shall be displayed in the Graphics Pane by selecting an ' Alarms' view. Alarms, and reporting actions shall have the following capabilities:
1. Alarms View: Each Alarm shall display an Alarm State (using a different icon for each alarm state), 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. An operator shall easily be able to sort events, edit event templates and categories, acknowledge or force a return to normal in the Events View as specified in this section.
 2. Alarm Classes: The operator shall be able to create, edit or delete alarm categories such as HVAC, Maintenance, Fire, or Generator.
 3. Alarm Areas: Alarm Areas enable an operator to assign specific Alarm Categories to specific Alarm Reporting Actions. For example, it shall be possible for an operator to assign all HVAC Maintenance Alarm on the 1st floor of a building to email the technician responsible for maintenance.
 4. 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.
 5. Alarm Configuration: Operators shall be able to define the type of Alarm generated per object. A property view of the Alarms shall expose all objects and their respective Alarm Configuration. Configuration shall include assignment of Alarm, type of Acknowledgement and notification for return to normal or fault status.
 6. 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.
 7. 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.
 8. Alarm Reporting Actions: Alarm Reporting Actions specified shall be automatically launched (under certain conditions) after an Alarm is received by the BAS server software. Operators shall be able to easily define these Reporting Actions using the Graphic Pane through the web browser GUI. Reporting Actions shall be as follows:
 - a. Print: Alarm information shall be printed to the BAS server's PC or a networked printer.
 - b. 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.
 - c. 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).

- d. Write Property: The write property reporting action updates a property value in a hardware module.
 - e. SNMP: The Simple Network Management Protocol (SNMP) reporting action sends an SNMP trap to a network in response to receiving an alarm.
 - f. Run External Program: The Run External Program reporting action launches specified program in response to an event.
- H. Trends: As system is engineered, all points shall be enabled to trend. Trends shall both be displayed and user configurable through the Web Browser GUI. Trends shall comprise analog, digital or calculated points simultaneously. A trend log's properties shall be editable using the Graphic Pane.
- 1. Viewing Trends: The operator shall have the ability to view trends by using 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.
 - 2. Local Trends: Trend data shall be collected locally by Multi-Equipment/Single Equipment general-purpose controllers, and periodically uploaded to 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.
 - 3. 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.
 - 4. Dynamic Update. Trends shall be able to dynamically update at operator-defined intervals.
 - 5. 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.
 - 6. Numeric Value Display. It shall be possible to pick any sample on a trend and have the numerical value displayed.
- I. Security Access: Systems that have 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:
- 1. 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.
 - a. View Privileges shall comprise: Navigation, Network, and Configuration Trees, Operators, Roles and Privileges, Alarm/Event Template and Reporting Action.
 - b. Edit Privileges shall comprise: Set point, Tuning and Logic, Manual Override, and Point Assignment Parameters.
 - c. Function Privileges shall comprise: Alarm/Event Acknowledgement, Control Module Memory Download, Upload, Schedules, Schedule Groups, Manual Commands, Print and Alarm/Event Maintenance.
 - 2. Geographic Assignment of Roles: Roles shall be geographically assigned using a configurable property view. 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.

2.6 LONWORKS NETWORK MANAGEMENT

- A. Systems requiring the use of third-party LonWorks network management tools shall not be accepted.
- B. Network management shall include the following services: device identification, device installation, device configuration, device diagnostics, device maintenance and network variable binding.

- C. The Network configuration tool shall also provide diagnostics to identify devices on the network, to reset devices and to view health and status counters within devices.
- D. These tools shall provide the ability to "learn" an existing LonWorks network, regardless of what network management tool(s) were used to install the existing network, so that existing LonWorks devices and newly added devices are part of a single network management database.
- E. The network management database shall be resident in the Network Area Controller (NAC), ensuring that anyone with proper authorization has access to the network management database at all times. Systems employing network management databases that are not resident, at all times and within the control system shall not be accepted.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 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 shown specified or shown on the control diagrams 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 permanently engraved phenolic labels.

3.4 WIRING

- A. All electrical control wiring to the control panels shall be the responsibility of the Control System Contractor.
- B. All wiring shall be in accordance with the Project Electrical Specifications (Division 16), the National Electrical Code and any applicable local codes. All control wiring shall be installed in raceways.
- C. Excess wire shall not be looped or coiled in the controller cabinet.
- D. Incorporate electrical noise suppression techniques in relay control circuits.

- E. There shall be no drilling on the controller cabinet after the controls are mounted inside.
- F. Careful stripping of wire while inside the cabinet is required to ensure that no wire strand fragments land on circuit boards.
- G. Use manufacturer-specified wire for all network connections.
- H. Use approved optical isolation and lightning protection when penetrating building envelope.
- I. Read installation instructions carefully. Any unavoidable deviations shall be approved by owner's rep prior to installation.

3.5 ACCEPTANCE TESTING

- A. Upon completion of the 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.
- B. 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.
- C. 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.

3.6 OPERATOR TRAINING

- A. 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.
- B. The Control System Contractor shall provide 24 total hours of comprehensive training in multiple four hour sessions for system orientation, product maintenance and troubleshooting, programming and engineering. These classes are to be spread out during the 1st year warranty period. The first class starting after final commissioning and the last class is to be in the last month of 1-year warranty period.

3.7 WARRANTY PERIOD SERVICES

- A. Equipment, materials and workmanship incorporated into the work shall be warranted for a period of one year from the time of system acceptance.
- B. 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.
- C. 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 a 5 Year

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.

- D. 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.
- E. 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.
- F. Service Documentation: A copy of the service report associated with each owner-initiated service call shall be provided to the owner.

3.8 OPERATION & MAINTENANCE MANUALS

- A. See Division 1 for requirements. O&M manuals shall include the following elements, as a minimum:
 1. As-built control drawings for all equipment.
 2. As-built Network Communications Diagram.
 3. General description and specifications for all components.
 4. Completed Performance Verification sheets.
 5. Completed Controller Checkout/Calibration Sheets.

END OF SECTION



Sidock Group
ENGINEERS-ARCHITECTS-CONSULTANTS

Corporate Headquarters
45650 Grand River Avenue
Novi, Michigan 48374
Ph: (248)349-4500 • Fax: (248)349-1429

Gaylord Office
757 S. Wisconsin Ave.
Gaylord, Michigan 49735
Ph: (989)705-8400 • Fax: (989)705-8403

Novi • Wyandotte • Muskegon
Lansing • Gaylord • Sault Ste. Marie
Detroit • Bay City
www.sidockgroup.com
www.sidockarchitects.com

Key Plan: No Scale

Client:
OTSEGO COUNTY LIBRARY

Project:
OTSEGO COUNTY LIBRARY EXPANSION

700 S. OTSEGO AVE
GAYLORD, MI, 49735

Seal:

Date: 09-05-17 Issued For: CONSTRUCTION
ADDENDUM #2

Drawn: PE
Checked: KS
Approved: BB

Sheet Title:
FIRST FLOOR HVAC PLAN

Project Number: 515747

Sheet Number: **M-201**

THIS MATERIAL IS THE EXCLUSIVE PROPERTY OF SIDOCK GROUP, INC. AND CANNOT BE REPRODUCED, COPIED, OR USED IN ANY MANNER WITHOUT THE WRITTEN CONSENT OF SIDOCK GROUP, INC. © 2017

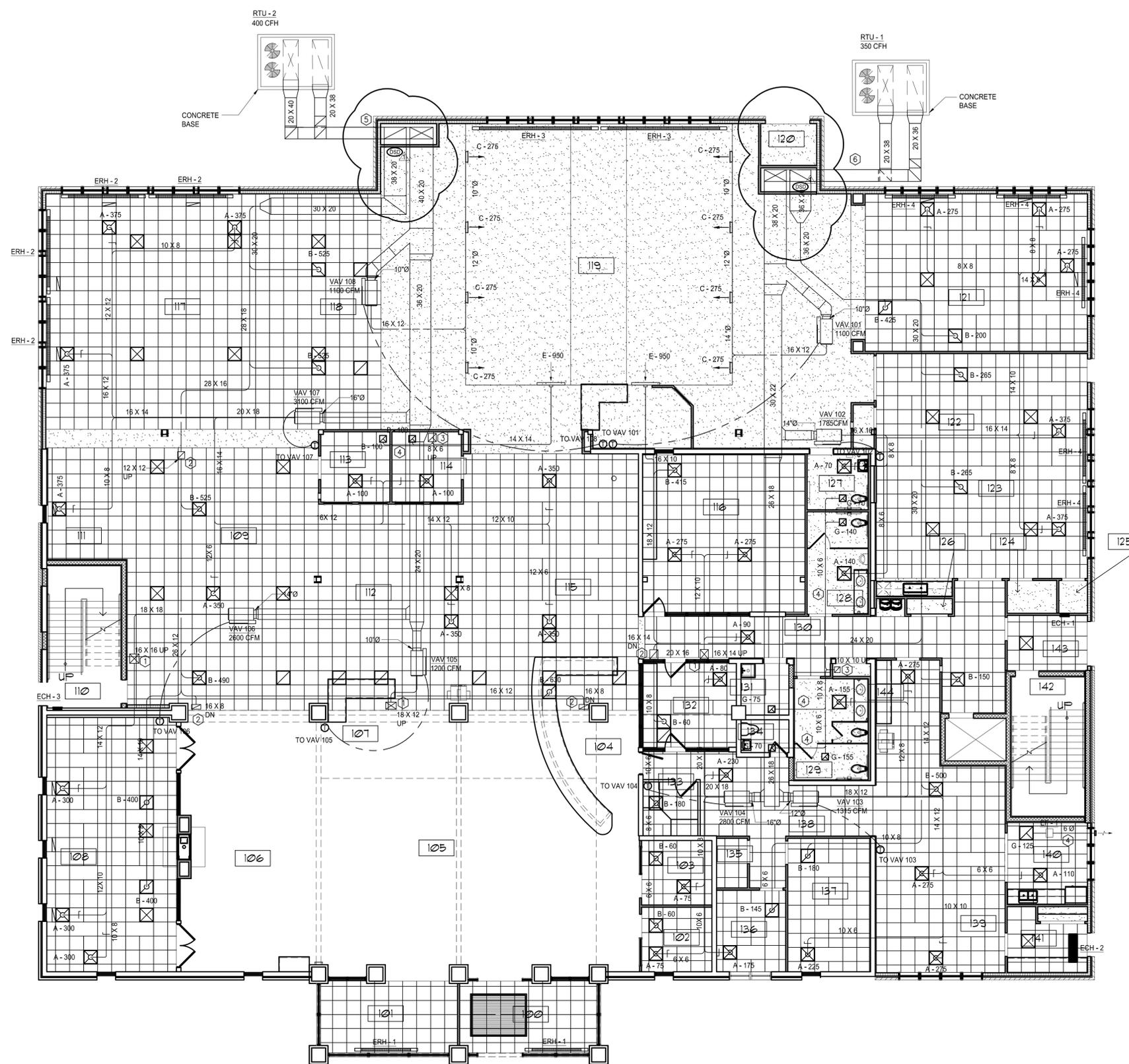
GENERAL MECHANICAL NOTES

1. THE MECHANICAL TRADES SHALL FAMILIARIZE THEMSELVES WITH ALL EXISTING AND NEW CONDITIONS, THESE DRAWINGS, ADDENDA AND RELATED SPECIFICATIONS. THEY SHALL COMPLETELY SATISFY THEMSELVES AS TO THE CONDITIONS TO WHICH THE WORK IS TO BE PERFORMED BEFORE SUBMITTING THEIR BID. NO ALLOWANCES OR CONSIDERATIONS WILL BE GIVEN AT A LATER DATE FOR ALLEGE MISUNDERSTANDING AS TO THE REQUIREMENTS OF THE WORK, MATERIALS TO BE FURNISHED, OR CONDITIONS REQUIRED BY THE NATURE OF THIS PROJECT SITE DUE TO NEGLECT ON THE BIDDERS PART TO MAKE SUCH AN EXAMINATION AND COORDINATION.
2. DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW APPROXIMATE LOCATION AND GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT. DRAWINGS SHALL NOT BE SCALED FOR LOCATION OF SYSTEMS, EQUIPMENT, ETC. ALL LOCATIONS OF SYSTEMS AND EQUIPMENT SHALL BE VERIFIED IN FIELD AND COORDINATED WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS. SOME SYSTEMS (PIPING, DUCTWORK, ETC.) AND EQUIPMENT LOCATIONS MAY REQUIRE CHANGES IN LOCATION DUE TO FIELD CONDITIONS AND COORDINATION WITH OTHER TRADES. THESE CHANGES SHALL BE MADE WITH NO ADDITIONAL COST TO THE OWNER. FAILURE TO VERIFY AND COORDINATE WILL BE NO REASON FOR ADDITIONAL COMPENSATION.
3. THE INSTALLATION OF ALL SYSTEMS, EQUIPMENT, ETC. IS SUBJECT TO CLARIFICATION WITH SUBMITTED SHOP DRAWINGS AND FIELD COORDINATION REQUIREMENTS. EQUIPMENT OUTLINES SHOWN ON DRAWINGS OR DIMENSIONED ON DRAWINGS ARE LIMITING DIMENSIONS. ANY EQUIPMENT THAT REDUCES THE INDICATED CLEARANCES OR EXCEEDS SPECIFIED OR SCHEDULED EQUIPMENT DIMENSIONS SHALL NOT BE USED.
4. THE ARCHITECT/ENGINEER AND OWNER RESERVE THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF EQUIPMENT, PIPING, DUCTWORK, ETC. AT THE TIME OF ROUGH-IN WITHOUT ADDITIONAL COST TO THE OWNER.
5. THESE DRAWINGS AND THE ASSOCIATED SPECIFICATIONS ARE INTENDED TO PROVIDE A COMPLETELY FURNISHED, INSTALLED AND OPERATIONAL MECHANICAL SYSTEM (HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND PIPING, ETC.). IF THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS HAVE INFORMATION OMITTED THAT WOULD NOT ALLOW A COMPLETELY OPERATIONAL SYSTEM, AS IS THE INTENT OF THE ENGINEER, THE BIDDER SHALL NOTIFY THE ENGINEER A MINIMUM OF ONE WEEK PRIOR TO THE BID DATE TO ALLOW FOR ADDENDA. ONCE BIDS HAVE BEEN RECEIVED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MATERIAL, LABOR, ETC., TO FURNISH AND INSTALL A COMPLETELY OPERATIONAL MECHANICAL SYSTEM AS IS THE INTENT OF THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS.
6. THE MECHANICAL TRADES SHALL TAKE OUT ALL PERMITS AND ARRANGE FOR NECESSARY INSPECTIONS AND SHALL PAY ALL FEES AND COSTS.
7. THE MECHANICAL TRADES SHALL COORDINATE ALL WORK WITH OTHER TRADES AND SHALL COORDINATE ANY SYSTEMS SHUT-DOWN WITH THE ARCHITECT/ENGINEER AND OWNER.
8. SEE SPECIFICATION FOR FURTHER INFORMATION.

KEYED NOTES:

- 1 SUPPLY AIR DUCT UP TO SECOND FLOOR.
- 2 RETURN AIR DUCT DOWN FROM SECOND FLOOR.
- 3 EXHAUST AIR DUCT UP TO SECOND FLOOR.
- 4 EXHAUST AIR DUCT IN FIRST FLOOR CEILING SPACE.
- 5 RETURN DUCT ROUTED LOW IN TO BUILDING, SUPPLY DUCT ROUTED ABOVE RETURN DUCT IN TO BUILDING.
- 6 SUPPLY DUCT ROUTED LOW IN TO BUILDING, RETURN DUCT ROUTED ABOVE SUPPLY DUCT IN TO BUILDING.

RM. NO.	ROOM NAME
100	VESTIBULE
101	ALCOVE
102	STUDY ROOM
103	STUDY ROOM
104	CIRCULATION DESK
105	MEDIA
106	LARGE PRINT
107	REFERENCE DESK
108	LOCAL HIST./QUIET RM.
109	ADULT NON-FICTION
110	STAIR
111	REFERENCE
112	COMPUTERS
113	STUDY ROOM
114	STUDY ROOM
115	NEW
116	TEEN ROOM
117	ADULT FICTION
118	YOUNG ADULT
119	YOUTH
120	MAINTENANCE RM.
121	PRESCHOOL/2ND GRADE CLOSET
122	CLOSET
123	MULTI-PURPOSE RM.
124	STORAGE
125	FIRE PROTECTION RM.
126	CLOSET
127	FAMILY RESTROOM
128	MEN'S
129	WOMEN'S
130	COORIDOR
131	JANITOR'S
132	CIRCULATION DESK
133	OPEN OFFICE
134	EX. STAFF RESTROOM
135	STORAGE
136	ASSIST. DIRECTOR OFF.
137	DIRECTOR'S OFFICE
138	COORIDOR
139	STAFF
140	BREAK ROOM
141	EMPLOYEE ENTRANCE
142	STAIR
143	VESTIBULE
144	MAIL ROOM



FIRST FLOOR HVAC PLAN
SCALE: 1/8" = 1'-0"