

IT IS THE MISSION OF THE SCHODACK CENTRAL SCHOOLS

to develop our students to become "...active, reflective, creative learners. In our schools, they will engage in rewarding work and practice behaviors that are intelligent in both an academic and a practical sense. Students will develop the attitudes, skills and understandings that will allow them to fulfill their potential and to function successfully in their individual and social roles."

Present: Michael Hiser, Michael Charsky, Mary Yurista, Christian Olsen, Bruce Romanchak, Victoria Adler, and Daniel Grandinetti

Absent: Paul Puccio and Michael Tuttle

Also present: Lee Bordick, Monica Kim, Michael Bennett, Jason Chevrier, James Derby and Jacqueline Hill

SCHODACK CENTRAL SCHOOL DISTRICT
1216 Maple Hill Road, Castleton, New York 12033-1699

July 25, 2016

Maple Hill High School Library

BOARD OF EDUCATION MINUTES – SPECIAL

1. Meeting called to order by President Hiser at 6:05 p.m.
2. President Hiser asked everyone to stand for the Pledge of Allegiance to the Flag.
3. Michael Charsky moved for approval of present agenda. Mary Yurista seconded, all present in favor.
4. Reports:
 - a. Commissioning – Matt LaClair explained the origin of Commissioning, it started with ships, Commissioning a ship to be sure everything was operational to go out to sea. He expressed that the Commissioning Agent will perform an 11 month check, they come back to check on everything and see if there are any problems. They look at the whole scope of the project and monitor every part. The district is buying a quality assurance that we get what we pay for from contractors. Current costs for Commissioning range from \$.40 – \$1.20 per sq. ft. and NOVUS is \$1.02 per sq. ft. Victoria Adler asked if the service was required or prudent, the answer was yes. Mary Yurista talked about the budget and if this was included in the capital project budget, the answer was yes, it is in the incidental portion of the budget. Chris Olsen asked about the 11 month checkup and if there is only one, the answer was there will be an 11 month check for each phase of the project, there are many phases.
 - b. Interim Superintendent search process – Michael Charsky shared the process that the board took to select an Interim Superintendent. There was a selection committee, they decided that Mr. Bennett would get approximately (4) four names of candidates for interim superintendents, information was collected. The Committee was interested in Lee Bordick, Administrators were consulted to see how they felt about working with Mr. Bordick, and it was decided that they wanted to ask Mr. Bordick and not waste other people's time to bring them into talk if they felt strongly about Mr. Bordick.
5. Board Discussion: None.
6. Meeting open for public discussion: Matt LaClair talked about the past 3 weeks and how the leadership of the district came together. He thanked them for the leadership. Renee Egan also spoke to how the district handled the situation and how the employees were notified; it speaks to the districts character and leadership. Mr. Romanchak talked about interactions he has had in the community since Mr. Horan's passing .

7. Consent/Appointments:

Bruce Romanchak asked that the items in the consent agenda be voted on separately and expressed that he is not in agreement with items b. and c.; not because of the candidate, but because of the process.

a. Michael Charsky moved for approval of a resolution appointing NOVUS Engineering, PC as Commissioning Agent for Schodack Central School District per their RFP dated June 30, 2016. Daniel Grandinetti seconded. All present in favor.

b. Michael Charsky moved for approval of a resolution appointing Lee Bordick as Interim Superintendent of Schools for the period from August 1, 2016 through June 30, 2017. Mary Yurista seconded, Bruce Romanchak voted no, all others present in favor.

c. Michael Charsky moved for approval of an employment agreement between Schodack Central School District and Lee Bordick. Mary Yurista seconded, Bruce Romanchak voted no, all others present in favor.

8. Board Discussion: Mary Yurista asked to talk about the next steps. Lee Bordick expressed that he is aware of the challenges that lie ahead; he is honored to carry on the projects initiated by his friend and colleague. He also expressed he is aware of the strong community involvement, and that in working together he is confident we can go the next steps. "It is with heavy hearts, but we need to move forward". He would like to continue with the plans of a board retreat and, is committed to move forward to assure that the first day, week and month are perfect. Michael Hiser and Lee Bordick will meet to plan some topics for the board retreat. Mary Yurista expressed that she was disappointed that she was not included in the doodle poll and will not be available for the August 20th retreat date. Mr. Hiser suggested that she participate in the planning. Bruce spoke about the date being the second part of two dates. He suggested that the board re-poll dates and see if they can find a date that every board member can attend. Succession and Capital Project are important and could take a whole day of a retreat. There was question from Mary Yurista of what the original plan was for a board retreat consisting of two dates. Mr. Hiser explained the original plan and asked Mr. Bennett to explain what the plan was. He explained that the intent was to plan ahead for the 2017-18 school year and be in a better position to let teachers know what their assignments will be in 2017-18. It is fundamental to get the information from architects yet we do not have formal approval from the state so timing is tight. Mr. Charsky expressed that he feels that two retreats are necessary and the sooner the better.

9. Public Discussion: Renee Egan asked about contract negotiations, it was shared that SFA has a team, the board has a team consisting of members of the board, the Superintendent, Director of Business & Support Services and Assistant Superintendent for Human Resources, Safe Schools and Pupil Personnel Services. Ms. Kim expressed that over the summer not much happens, but once school begins again in September, things will pick up again.

10. Action Items: Doodle Poll to canvas for more dates for a Board Retreat, a list of board committees and a description of each to board members, Lee Bordick and Michael Hiser to meet.

11. Adjournment. Having no further business before the board, President Hiser adjourned the meeting at 6:43 pm.

Respectfully submitted,
Michele A. Reickert
District Clerk

EMPLOYMENT AGREEMENT
INTERIM SUPERINTENDENT OF SCHOOLS

(August 1, 2016 – June 30, 2017)

This Agreement is made by and between **THE BOARD OF EDUCATION** (hereinafter the “Board”) of the **SCHODACK CENTRAL SCHOOL DISTRICT**, 1216 Maple Hill Road, Castleton-on-Hudson, New York, 12033 (hereinafter the “District”) and **LEE A. BORDICK**, residing at 16 Dykeman Road, Delmar, New York 12054 (hereinafter, “Mr. Bordick” or “Interim Superintendent”).

RECITALS

The Board wishes to employ a qualified administrator, as the Interim Superintendent to serve as the District’s chief school officer during the above noted period so as to assist in the efficient operation of the District while the Board begins its process of searching for and retaining a new Superintendent of Schools.

The Parties desire to enter into this Agreement to establish the terms of employment of Mr. Bordick by the Board and hereby agree as follows:

1. Employment.

The Board hereby appoints and employs Lee A. Bordick as Interim Superintendent of Schools of the District from August 1, 2016 to June 30, 2017, upon the terms and conditions contained in this Agreement. Mr. Bordick hereby accepts such employment and agrees to perform, to the best of his ability, the duties of such positions, upon the terms of this Agreement.

2. Term of Appointment and Employment.

- A. Mr. Bordick’s services shall be during the period commencing on August 1, 2016 and shall terminate on June 30, 2017, unless further extended or sooner terminated as hereinafter provided.
- B. The parties may, by mutual agreement, extend the term of Mr. Bordick’s employment. The Board agrees that if it wishes to seek an extension of the term of this Agreement with Mr. Bordick, it shall notify Mr. Bordick of its intent no later than May 1, 2017. Any extension of the term of Mr. Bordick’s employment shall be upon such terms and conditions as are mutually agreed upon and shall be in the form of an amendment to this Agreement.

3. Duties and Responsibilities.

As Interim Superintendent, Mr. Bordick shall be the chief administrative officer of the District and shall perform all the duties of and possess all of the authority now or hereafter imposed upon or granted to a Superintendent of Schools under the provisions of the Education

Law or other statutes of the State of New York, or by rule or regulation of the Board of Regents or Commissioner of Education.

The parties recognize that in order to further the efficient operation of the District, it is important to maintain direct lines of communication between the Board and Mr. Bordick, and the Board recognizes the importance of using such process to communicate concerns related to Mr. Bordick's performance.

4. Certification.

As a condition of employment, Mr. Bordick shall possess a valid certificate to act as a Superintendent of Schools in the State of New York during the term of his employment with the District.

5. Cooperation with Distinguished Educator.

The Interim Superintendent shall be required to cooperate fully with any distinguished educator appointed by the Commissioner of Education pursuant to the requirements of the Education Law.

6. Compensation.

As Interim Superintendent, Mr. Bordick's annual compensation shall be One Hundred Fifty Thousand Dollars (\$150,000) prorated to One Hundred Thirty-Seven Thousand, Five Hundred Dollars (\$137,500) for the period August 1, 2016 through June 30, 2017.

7. Benefits.

A. Insurance.

Mr. Bordick hereby waives his right to participation in the health insurance and other insurance related plans offered to District employees.

B. Leave Time.

- 1) Mr. Bordick shall be entitled to fifteen (15) days of sick leave during the term of this Agreement.
- 2) Mr. Bordick shall be entitled to twenty-five (25) vacation days during the term of this Agreement.
- 3) Mr. Bordick shall be entitled to five (5) personal days during the term of this Agreement to conduct business which cannot be conducted outside the school day.
- 4) Mr. Bordick shall be entitled to all legal holidays recognized by the District as days of school closure.

- 5) Except as noted above, Mr. Bordick will be expected to work during school vacation periods.

C. Other Benefits.

Except as expressly stated herein, Mr. Bordick shall not be entitled to any other benefits offered to some or all District employees.

8. Expense Reimbursement.

The District shall pay or reimburse Mr. Bordick for reasonable and necessary expenses (including mileage reimbursements at the applicable IRS rate for District-related travel) approved by the Board and incurred by Mr. Bordick in the continuing performance of his duties under this Agreement as permitted by state law and as approved by the District in the annual budget. The Board will pay or reimburse Mr. Bordick for all such expenses upon presentation, of an itemized account of such expenditures.

9. Indemnification.

The Board agrees to provide legal counsel and to indemnify Mr. Bordick against all uninsured financial loss arising out of any proceeding, claim, demand, suit or judgment by reason of alleged negligence resulting in bodily or other injury to any person or damage to the property of any person committed while Mr. Bordick is acting within the scope of his employment or at the direction of the Board ("Claim"), provided that Mr. Bordick delivers a copy of the notice of claim, summons, complaint or other document asserting the Claim to the District Clerk within ten (10) days of the actual receipt of such document by Mr. Bordick.

10. Other Work.

Mr. Bordick shall devote his full time, skill, labor and attention to the discharge of his duties during the term of this Agreement and shall not undertake consultative work, speaking engagements, writings, lecturing or other professional duties, obligations and activities for others without the prior consent of the Board.

11. Termination.

This Agreement may be terminated at any time by written agreement between the Board and Mr. Bordick. This Agreement may also be terminated by the resignation of Mr. Bordick submitted in writing to the Board upon ninety (90) days prior written notice to the Board. The Board may terminate this Agreement upon thirty (30) days prior written notice to Mr. Bordick.

12. Residence.

Mr. Bordick shall not be required to reside within the District during the term of this Agreement.

13. Notice.

Unless otherwise specified, all notices give under this Agreement shall be given in writing delivered as follows:

- A. To Mr. Bordick: Personally or by certified mail, return receipt requested, addressed to his residence on file with the District;
- B. To the Board: To the President of the Board of Education, personally or by certified mail, return receipt requested, addressed to his residence on file with the District, with a copy to the office of the District Clerk, personally delivered or by certified mail, return receipt requested.
- C. When Effective: Notice given by the mail shall be deemed given three days after mailing (not counting the day mailed) regardless of the date of actual receipt. Notice may be signed by Mr. Bordick, by the President or other Board member designated by the Board by resolution, or by an attorney for either party.

14. Severability.

Every provision of this Agreement is intended to be severable. If any provision is held to be invalid or unenforceable by the Commissioner of Education on appeal to him or by a court of competent jurisdiction, such provision shall be deemed modified or rescinded to the extent necessary to comply with law and all other provisions shall continue in full force and effect.

15. Miscellaneous.

- A. Savings Clause: If, during the term of this Agreement, it is found that a specific clause of the Agreement is illegal under federal or state law, the remainder of the Agreement shall not be affected by such a ruling, and shall remain in force.
- B. Full Force: This Agreement shall remain in full force and effect for the term noted herein and may not be otherwise terminated, modified or extended unless by an agreement, in writing, between the parties.
- C. Headings: The paragraph headings contained in this Agreement have been prepared for convenience of reference only and will not control, affect the meaning, or be taken as an interpretation of any provision of this Agreement.
- D. Waiver: In the event any term or condition of this Agreement should be breached by either party and the breach is thereafter waived by the other party, such waiver shall be limited to the breach so waived and shall not be deemed to waive any other breach either prior or subsequent to the breach so waived.
- E. Governing Law: This Agreement will be governed by and construed in accordance with the laws of the State of New York.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals as of the date first set forth above.

Dated: July ___, 2016
Castleton-on-Hudson, New York

**BOARD OF EDUCATION OF THE
SCHODACK CENTRAL SCHOOL DISTRICT**

By: _____
Michael Hiser, President

By: _____
Lee A. Bordick
Interim Superintendent of Schools

PROPOSAL
FUNDAMENTAL COMMISSIONING SERVICES
FOR
SCHODACK CENTRAL SCHOOL DISTRICT
SUBMITTED BY NOVUS ENGINEERING, P.C.
JUNE 30, 2016

**FUNDAMENTAL COMMISSIONING SERVICES
FOR
SCHODACK CENTRAL SCHOOL DISTRICT**

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June 30, 2016

Monica Kim, Director of Business and Support Services
Schodack Central School District
1216 Maple Hill Road
Castleton, NY 12033

Re: **Proposal to Provide Fundamental Commissioning Services**

Dear Ms. Kim:

Novus Engineering, P.C. is pleased to submit this proposal in response to the Request for Proposals (RFP) for Fundamental Commissioning Services issued by the Schodack Central School District, dated June 13, 2016. The requested commissioning services pertain to the District Wide Renovations, Safety & Security and Technology Project. Novus Engineering can provide high-quality and cost-effective building commissioning services to the District.

General identification and contact information for Novus Engineering, P.C. is as follows:

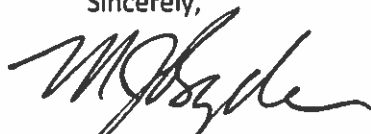
Novus Engineering, P.C.
25 Delaware Avenue
Delmar, NY 12054-1504
Website: www.novusengineering.com
Phone: 518-439-8235
Fax: 518-439-8592
Primary Contact: Mark J. Bagdon, P.E., Principal
Email: mbagdon@novusengineering.com
Phone: 518-439-8235, ext. 211

Staff leadership for contract tasks would be provided by the following individuals:

Mark Bagdon, P.E.: Principal-in-Charge
Matthew Gleason: Project Manager and Sr. Engineer

Thank you for the opportunity to submit this proposal and we look forward to hearing from you.

Sincerely,



Mark J. Bagdon, P.E., Principal

Section B: EXECUTIVE SUMMARY

Corporate Profile

Novus Engineering, P.C. ("Novus") is a multidisciplinary engineering consulting firm serving educational, institutional, commercial and industrial clients throughout New York State. Established in 1981 as Energy Resources Development Corporation, Novus provides mechanical/electrical engineering services and energy analysis, with a special focus on energy-consuming systems. Novus has a single office in Delmar, NY. Our professional staff numbers 17.

Novus staff members have a broad range of competencies and credentials: licensed professional engineers, LEED®-certified staff, certified energy managers, and lighting specialists. Staff members are expert in all aspects of building systems and energy utilization, including mechanical and electrical system design; energy studies and audits; building commissioning and retro-commissioning; energy system operation and troubleshooting; and building codes and standards.

Our project history includes substantial experience in commissioning for a variety of clients and building types. Representative projects include the operations and data center of the Office of the New York State Comptroller; Guilderland Central School District; Ravena-Coeymans-Selkirk Central School District; Presidential Park Elementary in Middletown, NY; dormitory buildings at Siena College in Loudonville, NY and Paul Smiths College in Paul Smiths, NY; new headquarters and quartermaster buildings for the New York State Police Troop G in Latham, NY; and two new science laboratory buildings at Bard College in Annandale-on-Hudson, NY.

Proposal Summary

Novus Engineering proposes to undertake fundamental commissioning for the District, as part of their District Wide Renovations, Safety & Security and Technology Project. Upgrades will take place at Maple Hill High School, and encompass upgrades to mechanical, electrical, and plumbing systems as well as new security, fire alarm, and technology systems. The project also includes architectural renovations, landscaping and site work, and fire protection system upgrades; however this work is outside the commissioning scope. The requested commissioning services are detailed in the District's Request for Proposals, dated June 13, 2016.

Novus' relevant experience to provide commissioning services is presented in Section C: *Project Experience*. As noted, Novus has broad experience with building commissioning engagements over the past decade. In Section C, five (5) selected projects are fully detailed, and key project parameters are summarized.

Project staffing is addressed in Section D (project organization chart) and Section E: *Staffing Plan and Resumes*. Project leaders include Mark Bagdon, P.E., Principal-in-Charge, Matthew Gleason, Project Manager, and Michael Schietzelt, P.E., Senior Electrical Engineer. In addition to resumes summarizing

education and experience, Section E includes a discussion of project role and commitment level for each key staffer.

Novus' approach to coordinating, scheduling, staffing and carrying out the Fundamental Commissioning services for the District are fully detailed in Section F: *Scope of Services and Project Approach*. We have provided a detailed scope of work based on careful review of project plans and specifications. Novus' approach will be to carry out the requested services as a coordinated effort across all trades, with portions of the commissioning documentation prepared separately by trade to optimize communications between project team members.

The Fee Proposal for Novus Engineering composes Section K. This proposal utilizes the RFP's Attachment B: *Bid Form – Fee Proposal*. Hourly rates for additional services are also provided, along with information about work week and other parameters.

Attachment 1 to the proposal is a Preliminary Draft Commissioning Plan for the District Project, per the RFP instructions.

Section C - PROJECT EXPERIENCE

The project descriptions in this section highlight Novus Engineering's ability to provide fundamental commissioning services for the Schodack Central School District. The requested project data and full contact information for owners are summarized below. Detailed project information sheets for five (5) engagements illustrating the full range of Novus' commissioning capabilities follow this summary.

Guilderland Central School District, Guilderland, NY

Services Provided	Commissioning (HVAC & Lighting Renovations)
Year Completed	2016 (Estimated)
Representative	Clifford Nooney
Title	Director of Facilities
Address	3 Dutchmen Lane Guilderland Center, NY 12085
Phone	518.861.5246 x301
Project Manager	Matthew Gleason
Team	Mark Bagdon, Ramy Girgis, Ryan Smith

Enlarged City School District of Middletown, Middletown, NY

Services Provided	Commissioning (New Construction)
Year Completed	2014
Representative	Tom Scott
Title	Superintendent of Buildings and Grounds
Address	223 Wisner Avenue Middletown, NY 10940-3298
Phone	845.326.1135
Project Manager	Matthew Gleason
Team	Mark Bagdon, Ryan Curry, Marianne Donovan

Ravena-Coeymans-Selkirk Central School District, Ravena, NY

Services Provided	RetroCommissioning, Energy Audit
Year Completed	2015
Representative	Stephen Meier
Title	School Business Administrator
Address	15 Mountain Road Ravena, NY 12143
Phone	518.756.5200
Project Manager	Matthew Gleason
Team	Mark Bagdon, Marianne Donovan, Ryan Smith

NYS Office of State Comptroller Operations Center, Troy, NY

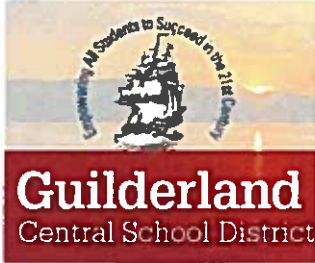
Services Provided	Commissioning (Major Renovation)
Year Completed	2015
Representative	Mike Stewart
Title	Senior Project Manager
Address	Turner Construction 365 Jordan Road Troy, NY 12180
Phone	518.432.0277
Project Manager	Matthew Gleason
Team	Mark Bagdon, Chris Maher, Jim Mackenzie

Troop G Headquarters and Quartermaster Buildings, Latham, NY

Services Provided	LEED® Commissioning (New Construction)
Year Completed	2013
Representative	Mark Chaffee
Title	Staff Inspector
Address	New York State Police Building 22 1220 Washington Avenue Albany, NY 12226
Phone	518.457.6621
Project Manager	Matthew Gleason
Team	Mark Bagdon, Marianne Donovan, Kalyan Nishtala

Guilderland Central School District District-Wide Renovations 2015-2016

Guilderland, New York



Novus Engineering, P.C. was hired by the Guilderland Central School District in 2014 to provide comprehensive commissioning services for mechanical, electrical and controls upgrades across seven district buildings. Novus has successfully completed commissioning for the first phase of renovation work, while the second phase is currently underway. Commissioning services have been provided for the following systems:

- New boilers and controls upgrades on existing boilers
- Variable Frequency Drives on pumps
- New air rooftop units, air handlers, unit ventilators, and cabinet heaters
- Variable Refrigerant Flow (VRF) systems
- New ductwork and piping
- Testing, Adjusting and Balancing (TAB) of new and existing systems
- Upgrades to existing DDC controls (6 buildings)
- Full pneumatic to DDC upgrade at one elementary school
- Lighting systems and controls

The commissioning scope of work included design-phase services, such as design review and specification development as well as pre-construction submittal review and planning services, which were completed in early 2015. During the course of construction, Novus has worked closely with the construction manager to coordinate start-up, TAB and functional testing services at each of the various buildings.

During the course of construction and functional testing, Novus has identified and assisted in the resolution of a wide range of mechanical and control system issues. Performance issues were also identified and corrected for several existing-to-remain HVAC systems which had been the source of routine complaints by district staff.

Novus has also provided technical guidance to the construction team in coordinating a revised completion schedule and controls scope of work for boiler plant upgrades, which was necessary to minimize heating system downtimes due to unexpected vendor delays.

Project commissioning services are expected to be completed Fall/Winter 2016, with follow-up review and reporting services carrying into 2017.



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Enlarged City School District of Middletown Presidential Park Elementary School

Middletown, NY



Novus Engineering, P.C. carried out commissioning activities for the construction of the new Presidential Park elementary school in the Enlarged City School District of Middletown, NY. Novus verified the installation and operation of all energy-consuming systems for the new school. The direct digital control (DDC) system was carefully reviewed to ensure that equipment performs

consistent with the design intent. In addition, Novus confirmed requirements necessary to obtain incentives from the New York State Energy and Research and Development Authority (NYSERDA) and certification under the High Performance Schools (NY-CHPS) program.

The new elementary school is approximately 208,000 gross square feet, with approximately 140,000 square feet serving as classroom space. The remainder of the building is composed of two gymnasiums, two cafeterias, two libraries and administrative and support spaces.

The walls are composed of continuous rigid insulation and spray foam, with a total assembly R-value of R-19.8. The roof is composed of rigid insulation with a rubber membrane and an assembly R-value of R-24.9. The HVAC system design includes central energy-recovery air handlers that provide conditioning and ventilation air to the large common spaces, such as the gymnasiums, cafeterias and library. In each classroom wing, a central energy recovery unit provides tempered fresh air to clusters of unit ventilators and fan coil units that condition each classroom. A boiler and chiller plant provides heated and chilled water to the air handlers, unit ventilators and fan coils throughout the building. Split air conditioning units serve data closets that are scattered throughout the building. The lighting system was designed using high efficiency fixtures equipped with fluorescent lamps and ballasts and automated controls.

Construction started in the spring of 2011 and the building was occupied in the spring of 2013. Commissioning activities started in September 2011 and continued through early 2014 in order to resolve outstanding controls issues.

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Ravena-Coeymans-Selkirk Central School District RetroCommissioning Ravena, New York



In October 2012, The Ravena-Coeymans-Selkirk Central School District (RCS) solicited proposals for retro-commissioning (RCx) services through the NYSERDA FlexTech Program. Novus Engineering was competitively selected to provide full RCx for all schools

in the District during the 2013 calendar year.

The goals of RCx the District schools included ensuring the following:

- Existing HVAC systems are in their proper operational state, and the air systems are balanced;
- Indoor air quality issues are addressed;
- Building pressures are set to proper levels;
- Energy and electrical demand costs are reduced;
- Occupant complaints due to equipment operational issues are reduced;
- Equipment life is increased due to proper operation and maintenance;
- Overall occupant comfort is improved; and,
- Equipment operation is optimized through system operational efficiency.

As a part of the project, Novus provided a full equipment inventory, an air quality investigation, functional testing for major mechanical systems, a Master List of deficiencies, and assistance in selecting and implementing cost effective and energy saving equipment improvements.

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New York State Office of State Comptroller Operations Center Troy, New York



Novus Engineering, P.C. provided mechanical and electrical commissioning services for the major renovation of the 42,000 square foot New York State Comptroller Operations Center located at 365 Jordan Road in Troy, New York. This facility contains a large computer center that performs the bulk of the data processing and printing required by the department. The mission-critical mechanical and electrical systems were designed to N+1 redundancy standards to assure reliability. Virtually all major mechanical and electrical systems were replaced and a new outdoor equipment yard constructed. The following systems were commissioned:

Mechanical Systems

- Air and water cooled chillers
- Dry and Liquid coolers
- Pumps and variable speed drives
- Computer Room Air Conditioners (CRAC)
- Hot and Chilled water systems
- Building Management System (BMS)
- Rooftop Air Handling Units
- Testing, Adjusting, and Balancing (TAB) for HVAC

Electrical Systems

- Paralleling Switchgear
- Emergency Generators
- Automatic Transfer Switches (ATS)
- Low voltage distribution panels
- Low voltage power and molded case circuit breakers (> 200 Amps)
- Uninterruptible power systems, batteries, battery monitoring
- Power distribution units
- Electrical Power Monitoring System
- Grounding equipment and system
- 600 Volt cable
- BMS monitoring of power equipment

Commissioning was conducted following ASHRAE Guidelines for mechanical systems and NETA ATS-2007 for electrical systems. In addition to component and system-level commissioning, the project included integrated testing to verify correct interaction of all support systems under all foreseeable failure modes. The commissioning schedule was complicated by the fact that the data center remained operational during the phased construction work. Novus was sole-sourced by the building owner for this project due to our ability to handle complex commissioning engagements. Commissioning work was completed in summer 2015.

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Troop G Headquarters and Quartermaster Buildings Latham, New York



Novus Engineering, P.C. served as the commissioning authority for a new, two-story 83,000 square foot headquarters building and a new, one-story 30,000 square foot Vehicle Maintenance/Quartermaster building for Troop G of the NY State Police. Construction started in the Spring of 2011 and continued through 2012. Services included preparing commissioning specifications,

reviewing the Owner's Project Requirements (OPR) and Basis of Design (BOD), reviewing the controls sequence of operation, conducting 60% and 80% design reviews, preparing a commissioning plan, making multiple site visits to inspect the installation of windows, insulation, HVAC equipment, lighting and controls systems, and performing functional performance testing of all major HVAC and lighting system components.

The headquarters building incorporates offices, conference rooms, training facilities, laboratories, and an energy-intensive data and emergency response center. The building is primarily conditioned by six variable air volume air handling units, which are served by boiler and chiller plants. Demand controlled ventilation has been incorporated where appropriate and the high efficiency lighting system utilizes occupancy sensors and daylight harvesting throughout a majority of the facility.

The quartermaster facility provides space for vehicle maintenance, special equipment storage and fit-up, and building and grounds. High efficiency rooftop units, in-slab radiant heat and numerous supply/exhaust fans condition the building.



Architect of Record:

Woodward Connor Gillies & Seaman

Overall Value of Work: \$28 million

Work Performed: 2009-2013

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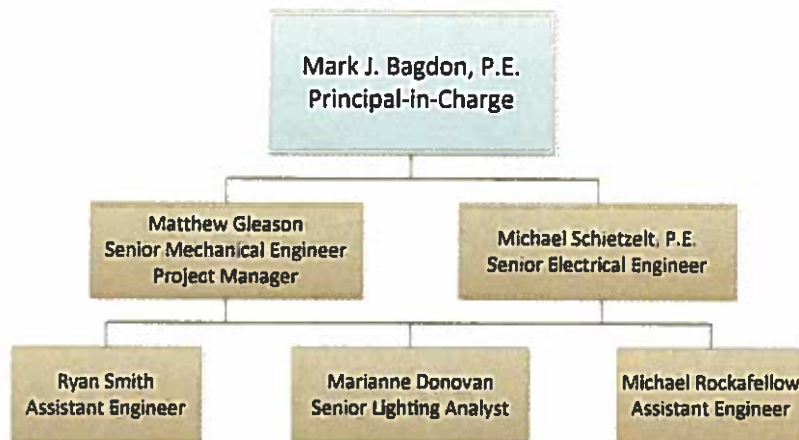


ENGINEERING, P.C.

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FUNDAMENTAL COMMISSIONING SERVICES
FOR
SCHODACK CENTRAL SCHOOL DISTRICT

PROJECT ORGANIZATIONAL CHART



Section E: STAFFING PLAN

Staff Roles and Task Commitment

Novus President Mark Bagdon, P.E., will serve as Principal-in-Charge, with Senior Mechanical Engineer Matthew Gleason as Lead Project Manager. Senior Electrical Engineer Michael Schietzelt will manage the electrical and telecommunications portion of the project. Mr. Gleason and Mr. Schietzelt will manage all commissioning tasks, with assistance from other Novus engineers as needed.

The level of project commitment shown below for Novus staff members represents the proportion of each staffer's time to be spent on Schodack School District commissioning tasks, relative to that staffer's overall workload. Commitment levels will, of course, vary to some extent over the course of the project, and dedication to this project could be substantially higher during intensive phases of commissioning activity.

Mark Bagdon has been a Registered Professional Engineer in the State of New York since 1993. He is also a Certified Energy Manager (CEM), as recognized by the Association of Energy Engineers, and a LEED[®] accredited professional (LEED[®] AP). Mr. Bagdon has 35 years of experience providing HVAC engineering, mechanical and electrical design, commissioning services, and energy management assistance. Over the past decade, he has been actively engaged as a recognized commissioning authority for multiple projects. As Principal-in-Charge for this assignment, he would oversee project tasks and provide final review of all work products for technical accuracy and completeness. His level of project commitment is anticipated to be 5% overall, but would be higher during project-intensive periods.

Matthew Gleason serves as Senior Project Manager for all Novus commissioning projects. Mr. Gleason is accredited as an Engineer in Training (EIT) and is currently pursuing Certified Commissioning Professional (CCP) credentialing through the Building Commissioning Association. Mr. Gleason would provide day-to-day management of project tasks and would take the lead role in preparing project documents. He will oversee scheduling of commissioning activities, plan and direct inspections and testing, and lead efforts to resolve questions and issues identified during the commissioning process. Mr. Gleason has extensive experience in the testing and troubleshooting of HVAC systems and associated control systems, and has worked on numerous school projects in the past. Mr. Gleason's overall time commitment is estimated to be 25% over the course of the project, but would be substantially higher during periods of active site work.

Michael Schietzelt is a Licensed Professional Engineer with over 12 years of experience in both electrical and nuclear engineering. Mr. Schietzelt is Novus' Senior Engineer for the design and inspection of electrical power systems, lighting, and specialty electrical systems. Mr. Schietzelt would oversee the completion of commissioning work within the electrical discipline, and would also assist Mr. Gleason in managing project activities and developing documentation. Mr. Schietzelt's project commitment is estimated to be 20% on average over the duration of the project.

Project engineer Ryan Smith has substantial experience in carrying out HVAC and plumbing systems commissioning on both new and existing equipment. Mr. Smith has worked on new construction commissioning and retro-commissioning projects for school districts, office buildings, medical buildings, and residences. Mr. Smith would assist in developing commissioning documentation, conducting site inspections, and carrying out functional tests. The level of project commitment anticipated for Mr. Smith is estimated to be relatively low during the planning and pre-construction phases, but may be as high as 50% during periods of active on-site commissioning work.

Marianne Donovan is a Certified Lighting Professional ("LC"), and is an expert in the design and commissioning of lighting and lighting controls systems. Ms. Donovan will work with the other commissioning team members to carry out site inspections and assist in resolving deficiencies. Her level of commitment to this project is expected to be approximately 20%.

Assistant Engineer Michael Rockafellow recently joined Novus from Harris Geospatial Systems. He would assist Mr. Schietzelt and Ms. Donovan with functional testing of lighting, technology, fire alarm, and security systems.

Resumes

Resumes for key Novus staffers who would be involved in the commissioning work for the District are attached. Educational qualifications, relevant project experience, and credentials for Novus' highly capable staff members are thoroughly described in the resumes.

MARK J. BAGDON, P.E., CEM, CGD, LEED AP

Commissioning Projects

Principal in charge for commissioning projects undertaken by the firm since 2005. Responsibilities include proposal and budget development; coordination with owner; commissioning plan development; quality control of all project documents including checklists, issue logs, field reports, and final reports; assistance in development of protocols for functional testing, and assistance in troubleshooting difficult problems. Several specific projects are described below.

NYS Police Troop G Headquarters and Quartermaster Buildings, Latham, NY

Provided fundamental and enhanced commissioning for two new buildings on NYS Police Troop G campus including a 30,000 ft² quartermaster building and 85,000 ft² headquarters building to meet LEED® v2.2 certification. Cx work included a wide variety of HVAC systems including VAV, VVT, raised floor AC, underfloor and overhead radiant heat, condensing boilers and both water-cooled and air-cooled chillers. Cx scope included detailed inspection of building envelope, all mechanical systems and equipment, and intensive verification of all DDC control system sequences.

Robbins Dormitory, Bard College, Annandale-on-Hudson, NY

Project Manager for design review and commissioning of new 50,800 ft² dormitory. Conditioning was provided by a geothermal well field; additional energy efficient features included variable speed drives, heat recovery, and high-efficiency lighting. Design review revealed that the geothermal system was greatly oversized. Novus recommended reducing the number of heat pumps from fourteen to seven. Once constructed, the building was confirmed to require only four heat pumps at any given time.

Golisano Hall, Hartwick College, Oneonta, NY

Project Manager for design review and commissioning of a new 37,500 ft² academic building containing classrooms, study areas, and faculty offices. The building is conditioned with a boiler/chiller plant feeding air handling units and fan coil units. Novus identified and rectified several critical issues during the course of construction, including interface difficulties between the boiler system and building management control system.

Sample of Non-Commissioning Projects

Union College, Schenectady, NY

Project Manager for energy auditing of approximately 45 buildings on the Union College campus. Identified \$1.1 million worth of energy efficiency measures and O&M improvements providing an annual savings of over \$230,000. Novus continues to provide design assistance for the implementation of previously identified measures.

Village Dormitories, Bard College, Annandale-on-Hudson, NY

Project Manager for MEP design for 14-building "green" dormitory project begun in 2000. Heating/cooling is provided by a geothermal heat pump system that has a remote, 42-well field. Space conditioning is accomplished with water-to-water heat pumps in each building supplying a two-pipe changeover system. Due to the superior energy efficiency of the original nine-building project, five new dorms were added using the same design. These buildings were added in 2005, 2009 and 2014.

Profile

Mr. Bagdon was a founding partner of the company that began as Energy Resources Development Corporation in 1981 and became Novus Engineering, P.C. in 1993. He has over 30 years of experience in the fields of energy analysis, energy-efficient design, and mechanical and electrical engineering. Novus has offered commissioning services since 2005. Mr. Bagdon is also a Certified Geo-Exchange Designer (CGD), a Certified Energy Manager (CEM), a LEED® Accredited Professional (AP), and an expert in acoustics. He is responsible for overall company management, quality control and review of work products, and selected technical work. In addition to supervision of design and analysis work, Mr. Bagdon has managed dozens of energy studies and commissioning projects for institutional, commercial, and industrial clients.

Education

Bachelor of Arts
Physics
Brown University

Masters of Science
Environmental Studies
Yale University

Accreditations

Licensed Professional Engineer:

- ◆ State of New York
- ◆ State of Massachusetts
- ◆ State of New Hampshire

Certified Geo-Exchange Designer (CGD)

Certified Energy Manager (CEM)

LEED® Accredited Professional (AP)

Memberships

Association of Energy Engineers (AEE)

Acoustical Society of America

American Society of Heating, Refrigerating, & Air-Conditioning Engineers (ASHRAE)

American Society of Plumbing Engineers

International Ground Source Heat Pump Consortium

MATTHEW GLEASON, EIT

Guilderland Central School District; Guilderland, NY

Project Manager and lead commissioning agent for a \$13.6 million renovation project between 2015 and 2016. Commissioning services included HVAC, lighting, and building control system upgrades across seven district buildings. Commissioned systems included full boiler plant replacements, existing boiler controls retrofits, new roof top units, unit ventilators, PTACs, VAV terminal units, ductless split systems, and new DDC hardware and programming. Functional testing of three different building management systems (BMS) was necessary to meet project requirements. The project's first phase was successfully completed in 2015; the second phase is ongoing and anticipated to be complete in Fall 2016.

NYS Office of State Comptroller Operations Center; Troy, NY

Project Manager and lead Cx4 for commissioning of the HVAC and electrical system renovation at the NYS OSC Operations Data Center. The building underwent a phased replacement of all HVAC, computer room AC, power, lighting and emergency power systems over an 18-month period. Mr. Gleason was responsible for management of commissioning team members throughout the process and he personally directed on-site functional testing of all HVAC and control systems. Mr. Gleason developed a project-specific integrated testing program and coordinated the execution of tests following substantial completion to verify proper interaction of all mechanical and electrical systems under normal and fault conditions. The project was completed in summer 2015.

Ravena-Coeymans-Selkirk Central School District; Ravena, NY

Project Manager for retro-commissioning efforts for the Ravena-Coeymans-Selkirk Central School District (RCS), which is composed of four separate schools totaling 377,700 ft². Services included a full HVAC equipment inventory, air quality investigation, functional testing of mechanical systems, and analysis of energy savings opportunities. A variety of low-cost and capital projects were recommended to improve air quality and energy efficiency.

NYS Police Troop G Headquarters and Quartermaster Buildings; Latham, NY

Provided fundamental and enhanced commissioning for two new buildings on the New York State Police Troop G campus including a 30,000 ft² quartermaster building and 85,000 ft² headquarters building to meet LEED® v2.2 certification. The buildings included a wide variety of HVAC systems including VAV, VVT, raised floor AC, as well as underfloor and overhead radiant heat. Thermal sources included condensing boilers and both water-cooled and air-cooled chillers. Project scope included detailed inspection of building envelope, all mechanical systems and equipment, and intensive verification of all DDC control system sequences.

Presidential Park Elementary School; Middletown, NY

Provided commissioning services for school-wide renovations in 2013 – 2014. Performed inspections and testing of entirely new HVAC systems, including boiler and chiller plant upgrades, air handlers, unit ventilators, and VAV terminals. Commissioning efforts focused heavily on testing of the Johnson Metasys building control system and collaboration with the controls contractor to develop and implement workable sequences of operation.

Profile

Mr. Gleason is a Senior Mechanical Engineer specializing in the analysis of existing mechanical designs and building commissioning. He serves as Project Manager for all of Novus' commissioning projects and is currently working towards becoming a Certified Commissioning Professional (CCP) through the Building Commissioning Association (BCA). Mr. Gleason also performs energy auditing of existing building systems for the purpose of reducing energy consumption, increasing occupant comfort and identifying cost effective energy efficiency retrofit measures. In addition, he performs acoustical engineering work, including acoustical analysis and design for architectural and environmental projects.

Education

Bachelor of Science
Mechanical Engineering
Cornell University

Master of Engineering
Mechanical Engineering
Cornell University

Accreditations

Engineer in Training (EIT)

MICHAEL J. SCHIETZELT, P.E.

Audi of Albany New Dealership, Albany, NY

Mr. Schietzelt designed all electrical systems for a new auto dealership, service garage, and parking lot lighting. The project included utility transformer and feeder sizing, power panel sizing and layout, fire alarm system, networking, and security system design. Project construction will be completed in 2017. Design and construction support was also provided for the overhaul of a vacant truck maintenance building for use as a temporary service garage.

Private Estate Residence and Entertainment Building, Columbia County, NY

Mr. Schietzelt provided electrical design work for a luxury 14,000 ft² residence and a 15,000 ft² entertainment building. Site design work included utility transformer and feeder sizing, backup generator selection, solar PV installation, site and roadway lighting, and electrical distribution to both properties. Interior work included power distribution, fire alarm, and security, networking, and entertainment systems. The project budget exceeds \$30 million.

Newport News Shipbuilding—Kesselring Site Operation, Ballston Spa, NY

Mr. Schietzelt was the Electrical Engineering Department Lead for the overhaul and repair of two nuclear reactor plants. As the Senior Electrical Engineer, he designed power and lighting systems for office and industrial buildings. He also designed security alarm and access control systems for use during plant maintenance periods. Mr. Schietzelt designed a 4160VAC power system with diesel backup to provide power to nuclear reactor facilities during major maintenance periods. He performed 15-year cleaning and inspections of 480VAC motor control centers, replaced MCC cubicles, and performed arc flash studies.

Electric Boat Corporation, Groton, CT

As Program Manager, Mr. Schietzelt developed a new program to deal with the design changes required for Commercial Off-the-Shelf Electronics (COTSE) obsolescence in submarine construction. He managed a \$7.5 million budget to directly address the COTSE design changes and equipment evaluations. The program resulted in the saving of over \$3 million in the first year. As Senior Electrical Engineer, he designed medium voltage distribution systems to support maintenance activities with remote control and monitoring stations. Mr. Schietzelt performed power distribution system design, voltage drop and motor starting calculations, transient and load flow analysis using EDSA software, and distribution system protection design, modeling, and testing for the USS Gerald R. Ford, CVN 78.

Profile

Mr. Schietzelt is a Licensed Professional Engineer with over 12 years of experience in both Electrical and Nuclear Engineering. He has extensive experience in new construction, renovation, building decommissioning, and demolition. He leverages his construction support experience to design buildings with a focus on value engineering up front. He provides correctly sized systems to minimize construction costs, while providing a design which meets all present and possible future needs. Mr. Schietzelt is a Lean / Six Sigma Black Belt and an EPA certified Asbestos Project Designer.

Education

Master of Science;
Electrical Engineering
Union Graduate College

Bachelor of Science;
Electrical Engineering
Clarkson University

Bachelor of Arts; Mathematics
State University of NY - Potsdam

Accreditations

Licensed Professional Engineer:

- ◆ State of New York
- ◆ State of Massachusetts
- ◆ State of New Hampshire

EPA Certified Asbestos Project Designer

OSHA 29CFR1910.1926 Fall Protection
Competent Person

Lean Six Sigma Black Belt

Awards

Excellence in Action Award; Huntington Ingalls Industries. Presented for the redesign of the lifting device on Ohio Class submarines. This design supported onsite maintenance, and ended 2 month maintenance delay at Norfolk Naval Shipyard, earning a Bravo-Zulu from the ship's Captain.

MARIANNE DONOVAN, IESNA, LC

Commissioning Projects

Ms. Donovan commissioned lighting and lighting control systems for the new construction projects listed below. She has also provided design review when required to verify light levels, light uniformity, and energy efficiency.

- Guilderland Central School District, Guilderland, NY
- Enlarged City School District of Troy - W.K. Doyle Middle School, Troy, NY
- Northern Adirondack Central School District, Ellenburg, NY
- Enlarged City School District of Middletown Presidential Park Elementary, Middletown, NY
- Ravena-Coeymans-Selkirk Central School District RetroCommissioning, Ravena, NY
- Troop G Headquarters and Quartermaster Buildings, Latham, NY

Albany International Airport, Albany, NY

After completing a thorough lighting audit of the 280,000 ft² terminal, a recommendation to replace nearly 2,000 fixtures was implemented. Existing fluorescent and incandescent lighting was replaced with LED lighting and automatic controls, providing a 76% reduction in electrical load. Annual savings are expected to total about \$66,000.

In an earlier airport project, Ms. Donovan contracted, bid and managed a lighting upgrade of the 580,000 ft² parking garage, which earned utility incentives and yielded a simple payback of less than 2.5 years.

Siena Massry Commons Dormitory Project, Loudonville, NY

Designed the complete interior and exterior lighting system for a new 89,000 ft² dormitory for Siena College. The lighting design included daylighting and occupancy sensor controls and resulted in an overall lighting power density of 0.78 W/ft², a 30% reduction from ASHRAE Standard 90.1-2007 requirements.

Farm Family Insurance, Glenmont, NY

Conducted comprehensive room-by-room lighting audit for the Farm Family facility in Glenmont, New York. Identified and recommended multiple lighting retrofit projects to provide a potential savings of \$41,000 in annual utility costs. Worked closely with facility staff to prioritize projects, install mock-ups of recommended lighting fixtures and layouts, and bid projects.

NYSERDA New Construction Program

Ms. Donovan provides lighting design review and recommendations for all Novus design projects, as well as projects for which Novus provides NYSERDA Technical Analysis services. She has had an integral impact on the energy efficiency success for the lighting designs on the NCP projects.

Profile

Ms. Donovan is a Senior Lighting Engineer with over 20 years of experience in the lighting field. She is "Lighting Certified" by the National Council on Qualification for the Lighting Professions. Her responsibilities include preparing energy efficient lighting designs for new and retrofit projects; carrying out field work, analysis and calculations for lighting audits; obtaining available incentives for lighting projects from utility and state sources; and maintaining and updating the in-house lighting database program ("Illuminator"). She also conducts peer reviews of lighting designs by other firms under the NYSERDA New Construction Program.

Ms. Donovan is proficient in the use of lighting design modeling programs, including AGI32 and Visual Profession.

She has won several awards for her lighting designs from the Illuminating Engineering Society.

Education

Certificate in Electro-Mechanical Design
Women's Technical Institute
Boston, MA

Accreditations

NCQLP - National Council on Qualification
for the Lighting Professions, Lighting
Certification

Memberships

Illuminating Engineering Society of North
America (IESNA); President, Albany
Section

Awards

IESNA Meritorious Service Award, 2012:
Presented for outstanding service that
has significantly furthered the purpose of
the Society.

RYAN SMITH, EIT

Guilderland Central School District, Guilderland, NY

Staff engineer for the commissioning of a multi-phase renovation of seven school buildings. Over the course of two years, commissioned new HVAC systems and equipment including boiler plants, roof top units, air handling units, VAV boxes, terminal equipment, ductless split systems, and building management systems (BMS). Multiple different BMS systems were installed & commissioned within the various buildings to meet the district's controls contract requirements. Functional testing has been performed on all equipment to ensure performance conformed with design intent. Completion is anticipated in 2016.

Siena College New Instrumentation Research Lab, Loudonville, NY

Assisted in the commissioning of a 1,430 ft² student research laboratory renovation at Siena College. Commissioned equipment included two air handling units, two remote condensing units, air compressor and dryer, nitrogen generator, and inert gas fire protection system. Actively worked with all involved parties to keep this heavily coordinated project on its tight timeline and opened prior to the start of classes.

Crystal Run Healthcare, Middletown, NY

Staff engineer for commissioning of a new 60,000 ft², three-story medical office building. Commissioned systems included all HVAC systems, building management system, and lighting systems. The HVAC systems included packaged rooftop units with VVT zoning controls as well as ductless split AC systems. Worked on project team to inspect, test, and report on all aspects of the commissioning process.

Malta Med Emergent Care, Malta, NY

Staff engineer for commissioning of a new 60,000 ft², two-story medical care facility. The building includes exam rooms, treatment rooms, laboratories, medical equipment rooms, and private offices. The commissioning scope of work included all HVAC systems, building management system, and lighting systems. The building is served by multiple packaged rooftop units with both VAV and VVT zoning controls. All commissioned systems were inspected and functionally tested to verify an correct installation and operation.

Ravena-Coeymans-Selkirk Central School District, Ravena, NY

Carried out functional testing of HVAC equipment, and compiled an HVAC equipment inventory for four District schools. Provided recommendations to improve the indoor air quality and decrease energy usage and costs for all schools and assisted with implementation of these recommendations.

Private Estate Residence and Entertainment Building, Columbia County, NY

Lead plumbing and HVAC designer for 14,000 ft² private residence. A geothermal ground-loop system with water-to-water heat pumps provide hot and chilled water. Terminal units include fan coil units and radiant floors. Due to poor water quality, an extensive water treatment system was designed. Revit was used during the design to provide a high level of coordination due to a challenging architectural design.

Profile

Mr. Smith is a Mechanical Engineer specializing in HVAC and plumbing systems, working on Commissioning and Design projects. Mr. Smith also works with NYSERDA's New Construction and Existing Facilities Programs, where he performs whole building analysis with building energy modeling software. He also assists with energy audits of existing buildings in order to reduce energy usage and increase occupant comfort.

Education

Bachelor of Science
Mechanical Engineering
Rensselaer Polytechnic Institute

Accreditations

Engineer in Training (EIT)

Section F – SCOPE OF SERVICES AND PROJECT APPROACH

The proposed District Wide Renovation project includes equipment upgrades and replacements throughout Maple Hill High School. The commissioning services described in this section will be provided for new work associated with the following types of systems: HVAC, building controls systems, lighting and daylighting controls, domestic hot water systems, and technology/fire alarm/security, as shown on the 95% Construction Documents. A summary of the specific equipment and systems which are proposed for inclusion in the commissioning scope of work is included at the end of this section. This list was developed based on a review of the plans and specifications, along with the requirements outlined in the RFP. The list of systems to be commissioned will be finalized when the Commissioning Plan is developed.

Novus proposes to carry out the requested commissioning services as a coordinated effort between trades and across all phases of the project. Portions of the commissioning documentation (checklists, reports, etc.) will be developed independently for each trade, as necessary to streamline and optimize the communications process. During the course of inspections and testing, checklists, issues logs, and field reports will be prepared and distributed to the appropriate parties. At the conclusion of the project, all documentation will be gathered and included in a single, comprehensive final commissioning report, which will be submitted to the Owner.

Key staff would be assigned to this commissioning project from start to finish in order to ensure a consistent work product. The majority of work on this project will be carried out by the project manager and one to three additional engineers, depending on the construction schedule and division of labor between mechanical and electrical engineering disciplines. All Novus staff work closely together and communicate regularly to carry out tasks. Further descriptions of key staff roles are included in Section E of this proposal.

The following scope of work outlines the tasks Novus, as Commissioning Authority (CxA), intends to carry out in order to complete this project:

1. Pre-Construction

- 1.1 Review design drawings and specifications for adequacy of commissioning language. Focus on critical elements related to commissioning including: controls system devices and sequence of operation, hydronic system flushing, hydronic and air systems testing and balancing, contractor and start-up technician responsibilities during the commissioning process, and documentation requirements. Provide comments to the Owner and Design Team before the bid documents are finalized.
- 1.2 Assist in the development of commissioning specifications for inclusion with the project bid documents. Develop and recommend incorporation of additional commissioning requirements into individual equipment specifications, as needed.
- 1.3 Prepare and distribute a draft Commissioning Plan for review and comment by the Owner and Design Team. The plan will include the list of equipment to be commissioned, commissioning procedures and responsibilities, equipment checklist and startup procedures, and descriptions of the proposed functional test procedures. A preliminary commissioning schedule will also be included. This schedule will be developed based on a review of the proposed construction schedule and discussions with the Construction Manager.
- 1.4 Based on comments received, edit and distribute the final Commissioning Plan. Assist the Construction Manager with integrating key aspects of the plan into the project construction schedule. Following revisions, Novus will review the updated schedule to verify that adequate time allowances and proper sequences are included for commissioning activities.
- 1.5 Conduct a scoping meeting to review commissioning process and procedures with the Owner and Design Team. Identify key parties responsible for communication and issue resolution during the commissioning process.
- 1.6 Novus will develop pre-functional checklists for the HVAC equipment to be commissioned using standard checklist formats, customized for the equipment to be commissioned. Where applicable checklists are available from the contractor and/or manufacturer, these checklists may be reviewed and used by the CxA.
- 1.7 Novus will rely upon pre-functional checklists developed and submitted by the contractors for the pre-functional documentation checks of all Technology, Fire Alarm, Security and Lighting systems. Novus will review and comment on the checklists submitted by contractors prior to their use.
- 1.8 Novus will develop Functional Performance Testing (FPT) protocols based on the Construction Documents. Draft FPT forms will be submitted to Owner and Design Team for review and comment. Final FPT forms will be prepared based upon the comments received and equipment-specific information included in the approved submittals.
- 1.9 Attend and participate in pre-construction meetings with the Owner and Design Team. Up to four (4) pre-construction meetings have been budgeted for in this proposal.

2. Construction Phase

- 2.1 Conduct a commissioning kick-off meeting with the construction team to introduce team members, review the Commissioning Plan and schedule, discuss important roles and responsibilities, and answer any questions.

- 2.2 Lead on-site commissioning meetings to review construction progress and discuss upcoming activities. Review the project schedule with the commissioning team to ensure commissioning activities are properly incorporated and scheduled. A total of eight (8) commissioning meetings over the course of the project have been budgeted for in this proposal (not including informal on-site meetings or regular job meetings, which will be attended on an as-needed basis in combination with construction inspections).
- 2.3 Review contractor submittals applicable to systems being commissioned. Review will be concurrent with the normal Architect/Engineer review process; however, formal comments and approval by the CxA will not be required as part of the submittal review process. This review will primarily focus on evaluating compliance with commissioning needs.
- 2.4 Make periodic site visits during construction to spot check equipment and review overall quality of installation of related systems, e.g., piping and ductwork, insulation, maintenance access for mechanical equipment, control equipment and location.
- 2.5 Issue field observation reports as needed following site visits to communicate any important observations, deficiencies, or upcoming activities. Deficiencies and questions requiring response by the construction or design team will be tracked on an issues log. This issues log will be updated and distributed to all key members of the project team for review and response.
- 2.6 Should issues arise which are not specifically addressed by the construction drawings or specifications, the CxA may assist in proposing corrective actions to the CM and/or design team. It is ultimately the responsibility of the designers to participate in the resolution of deficiencies and provide timely answers to questions and direction on design changes or clarifications.
- 2.7 Observe a selected portion of hydronic system pressure testing and flushing, where applicable. Observe a selected portion of ductwork testing, where applicable. Testing plans and schedules will be reviewed with the contractors in advance so that observations may be scheduled with the Construction Manager.
- 2.8 All pre-functional checklists (PFCs) will be completed by contractors, under their own direction, according to project construction specifications. Contractors shall notify the CxA when the required work is complete and verified so that the CxA may review the completed checklists and perform spot checks to verify accuracy.
- 2.9 The CxA will rely on the CM to help manage and oversee the checklist completion process. Each installer (and start-up technician, where applicable) will be responsible for accurately completing checklists and returning completed checklists to the CM. The CM will collect and review pre-functional checklists, along with the CxA, as contractors complete them. Deficient items will be reported to the CM for resolution, after which the CxA shall follow-up on any open items.
- 2.10 Carry out field inspections to spot check pre-functional checklist accuracy. If significant differences between checklist reports and installed conditions are observed, a report will be made to the CM and Owner. The CxA may request a full review of all checklist items by the installing contractor and re-submission of the relevant checklist(s) before agreeing to a re-inspection.

- 2.11 Review functional test requirements with mechanical and controls contractors prior to implementation.
- 2.12 Verify that all critical field observation report issues have been addressed prior to start-up of equipment.

3. HVAC Start-Up

- 3.1 Witness selected start-ups; note any issues and report to CM and Owner. Following completion of start-up on each system, request copies of contractor and/or manufacturer start-up reports. The CxA will review start-up reports for completeness and evidence of deficiencies.
- 3.2 Meet with Testing and Balancing (TAB) contractor on-site prior to the commencement of TAB work to review procedures. Address any open questions related to balancing and confirm with balancing agent that a site inspection has been completed to verify adequacy of installed balancing devices and access to equipment.
- 3.3 The CxA may elect to witness a portion of TAB work. Based on the results observed and the complexity of the systems being balanced, the CxA may elect to spot check flows with independent test equipment. Report any questionable results to design engineer for review and comment.
- 3.4 Review draft testing and balancing report. Report deficiencies to CM. Assist in coordinating the correction of deficiencies and retesting by the TAB contractor, as required. Once issues have been resolved and the report re-submitted, review and approve the final TAB report.
- 3.5 Meet with controls contractor during point-to-point checkout to observe procedures and discuss concerns. Review the contractor's checkout forms prior to use. The CxA may elect to witness a portion of this checkout process.
- 3.6 The CxA will request copies of the contractor's completed point-to-point checkout forms to review. Review any non-compliant or incomplete items with the controls contractor and assist in coordinating corrections and re-testing. The CxA intends to rely upon cooperation by the controls contractor in providing documentation of checkout results. The CxA will not independently duplicate this controls checkout process as a part of functional testing; however, a selected number of control points may be spot-checked for acceptable function during the course of HVAC system functional testing.

4. Functional Testing of HVAC, Building Controls Systems, and Domestic Hot Water Systems

- 4.1 Functional testing will be completed under the direction of the CxA, with hands-on assistance from installing contractors as needed to execute the tests. The CxA will coordinate, direct, and document the tests. The installing contractors and vendors shall execute the required tests at the CxA's direction.
- 4.2 Once equipment start-up has been successfully completed and approved by the CxA, schedule functional performance testing with CM and appropriate contractors. The CxA will expect notification at least two weeks in advance of anticipated system readiness for functional testing in order to allow adequate time for coordination and scheduling among involved parties.
- 4.3 The CxA will not commence functional testing on a given system until all installation and start-up work is completed for the system. If incomplete installation work requires the

delay of scheduled functional testing, the CxA will notify the CM as soon as possible to help avoid delays in the project schedule. It will not be the responsibility of the CxA to resolve scheduling conflicts or to ensure that installation and start-up delays do not impact the project schedule. Unless specifically directed by the Owner, the CxA will not compromise the integrity of the commissioning process in order to meet compressed schedule deadlines which differ from the time allowances established in the commissioning plan.

- 4.4 Following each round of testing, track deficiencies on the commissioning issues log, which will be distributed to appropriate parties for review. Note that it is expected that the Owner, Designers, CM and applicable contractors will respond to issues identified during the commissioning process in a timely manner. It is not the responsibility of the CxA if delayed or inadequate responses to reported issues impact the overall project schedule. Failure to respond to commissioning issues according to project specification requirements will delay the commissioning process and may impact the commissioning budget.
- 4.5 Document test results using functional performance testing checklists. Following each round of testing, prepare and distribute summary functional testing reports that describe the testing progress to date, the results of testing, and any open issues. Following corrections by the installing contractor(s), coordinate a schedule for re-testing of systems to confirm issues have been successfully resolved.
- 4.6 If functional testing of any equipment reveals deficient items which were reported to be completed during the pre-functional or start-up checkout process, the CxA will document the deficient items that require correction and re-testing. The cost to direct and carry out retesting of such items will be back-charged to the appropriate installing contractor.
- 4.7 Among other things, tests will focus on functionality according to the engineer's sequence of operation, manufacturer specifications, and typical best practice. Identify obvious problems such as temperature instability, fan or pump instability, inefficient operation, short cycling of equipment, and response of back-up sequences. Determine whether all basic operating parameters are within expected ranges.
- 4.8 Use BMS trend logs, graphical displays, and/or independent temporary data loggers to analyze system performance over an extended period of time. If made available, Novus will utilize remote access to monitor the BMS off-site for supplemental performance observations.

5. Functional Testing of Lighting Systems

- 5.1 Lighting and lighting control systems will be inspected and tested according to standard best practice and to meet minimum requirements of the 2016 NYS Energy Conservation Construction Code. Functional test procedures will include the following:
 - 5.1.1 Occupancy Sensor Controls: Verify proper location, aiming, and calibration. Test sensors according to sampling strategy to verify performance of auto-on, dimming, manual switching, and time-delay auto-off functions. Confirm fixtures are not turned on by occupant activity outside the intended control zone.
 - 5.1.2 Time Switch Controls: Confirm scheduling, battery back-up, override function, and manual switching function as intended.
 - 5.1.3 Daylight Responsive Controls: Verify proper sensor location, calibration, and sensitivity settings. Test sensors and fixture dimming performance according to

sampling strategy across different areas of the building. Confirm provided light levels meet design requirements.

5.1.4 Fixture lamps, circuiting and switching: Verify counts and color temperature conform to design requirements and/or approved coordination plans. Verify fixtures are properly wired according to the specified switch circuiting.

5.2 Identify any deficiencies or deviations from the design documents and submit issues log to installing contractor for corrections. Following written notice that all reported issues have been resolved, schedule a follow-up inspection to verify satisfactory results.

6. Functional Testing of Technology/Fire Alarm/Security Systems

6.1 Technology systems shall be inspected and tested to verify proper installation and configuration by the installing contractor/vendor. Novus will coordinate and direct the functional testing procedures with on-site assistance and any proprietary hardware or software provided by the installing contractor/vendor.

6.2 Wireless access points and interactive white boards will be inspected for proper physical installation and function according to project requirements. The results of the pre-functional inspections documented by the installer will be reviewed and spot-checked throughout the school. Functional test procedures shall be developed following a review of the bid documents and approved equipment submittals, but will generally seek to confirm satisfactory power connections, wireless signal performance, reliability, integration with building network systems, and consistency of end-user experience.

6.3 Data and phone drops will be inspected for completion of work within rooms and at data racks. Labeling of circuits will be inspected for proper completion. The results of pre-functional inspections documented by the installer will be reviewed and spot-tested by Novus. Should testing reveal deficiencies, Novus will recommend re-inspection of all cabling by the installer and will require a verification report prior to scheduling final re-inspection.

6.4 Fire Alarm system testing shall be performed according to standard industry practices. Novus will complete on-site inspections of installed hardware, and will oversee the coordination of testing procedures to be executed by the fire alarm contractor. Results of testing will be reviewed by Novus, and re-testing scheduled as-necessary should deficiencies be identified.

6.5 Security system testing shall be coordinated and directed by Novus. Execution of tests shall be performed by the installing contractor/vendor. Novus shall inspect the installed system hardware for conformance with project requirements and shall witness the performance testing of cameras, card readers, and door locks. If issues are observed, a deficiency report will be generated and corrections shall be made by the installer. Following corrections, a follow-up meeting will be scheduled to review results and witness re-testing.

7. Commissioning Report and Documentation

7.1 Maintain commissioning activity and issues log throughout the commissioning process. Distribute to key members of the project team following updates.

7.2 Prepare and distribute field inspection and functional testing summary reports following site visits to communicate commissioning progress and outstanding issues to the Owner and construction team.

- 7.3 Prepare a final commissioning report which shall document the entire commissioning process for all buildings included in the renovation project. This report will include (at a minimum) the following information:
 - 7.3.1 A summary of the commissioning process and results.
 - 7.3.2 A summary of the Commissioning Agent's opinion on the adequacy of the installation, performance, and documentation of the commissioned systems.
 - 7.3.3 Any relevant recommendations for the future improvement or maintenance of the commissioned equipment.
 - 7.3.4 Descriptions of the functional testing approach and results, along with copies of the functional testing checklists.
 - 7.3.5 All field reports, memos, and the final version of the issues log included as appendices.
- 7.4 Completed pre-functional checklists and functional testing checklists will be organized into a labeled binder and provided to the Owner. Blank functional performance testing forms can also be provided for future use by the Owner during maintenance checks, if desired.
- 7.5 Receive copies of the O&M manuals for each commissioned system from the CM. Review the content and organization of the manuals for acceptability and provide comments to the CM and/or responsible contractors.
- 7.6 A systems manual will be developed and turned over to the Owner following substantial completion. This manual will be a single document, which applies to all of the new work which was commissioned as a part of this project. The manual will include a description of how the HVAC and controls systems function as a whole and will provide information for future system operators on how to maintain energy efficient operation of the systems in the future. Among the information included will be summaries of the equipment operating sequences, recommendations for energy-efficient operation of systems, copies of the single line drawings and schematics, and recommended re-commissioning and maintenance practices.

8. Deferred Testing, Warranty Review & Training

- 8.1 Review schedule of training for commissioned systems and review agenda for compliance with training requirements specified in the construction documents. Oversee the training of owner personnel and assist in coordinating the resolution of any outstanding questions. The CxA may elect to witness a portion of training, but attendance will not be mandatory.
- 8.2 Specific functional tests may be identified during the commissioning process which must be deferred for completion until after substantial completion. These may be unforeseen deferred tests, resulting from schedule changes or incomplete installations, or seasonal tests, which require specific weather conditions. Such tests will be identified and reported to the Owner and CM so that they may be scheduled for a later date.
- 8.3 Schedule a meeting with facility staff approximately two months before warranty expiration to review operation of the commissioned systems and address any outstanding concerns related to the commissioning process. Should additional issues be identified, the CxA will notify the CM so that the appropriate installing contractor or equipment manufacturer can be brought back to resolve deficiencies before the end of the warranty period.

Scope Clarifications & Assumptions

Modifications to the existing Direct Digital Building Control System have been specified as part of this renovation project. It is understood that the existing Building Management System (BMS) is a Johnson Controls brand system, and that the existing control hardware and programming will remain unchanged for existing-to-remain equipment that is outside the scope of this project. The existing-to-remain equipment and BMS programming not specified in Section 230924 will not be commissioned as part of this project.

For the new HVAC work specified, the associated BMS modifications (new controls hardware, programming, and graphical user interfaces) will be commissioned in-full. The new controls specified for existing systems will also be commissioned. The commissioning scope of work assumes that the commissioning agent will be provided full access to the BMS front end for testing purposes. Access can be either via web-based interface on the commissioning agent's computer and/or via a computer provided by the controls sub-contractor for the purpose of executing commissioning tests.

The efficient completion of BMS commissioning tests will depend upon cooperation by the district's IT personnel to provide local and/or wireless building network access for the purpose of connecting to the BMS. This proposal assumes that the district's IT personnel will provide support to both Novus and the controls sub-contractor as needed during the commissioning process.

If the existing BMS hardware or programming is found to be inadequate for executing any planned commissioning tests, Novus will notify the Owner and Construction Manager before scheduling testing. If routine maintenance of existing-to-remain controls system hardware is necessary, the CxA may elect to defer selected functional tests of HVAC systems until repair work is completed.

Systems Included in Commissioning Scope based on 95% Drawings:

Heating Ventilation and Air Conditioning Systems

- Rooftop Units
- Ductless Split AC
- Energy Recovery Ventilators
- PTAC Units
- Unit Ventilators
- Fan Coil Units
- Cabinet Unit Heaters
- Exhaust Fans
- New Ductwork for above systems
- New Hot Water Piping for above systems
- Hot Water Pumps
- New Boiler Room Piping and Equipment

Building Controls Systems

- Modifications as specified in Section 230924

Lighting and Daylighting Controls

- All New Light Fixtures
- Occupancy and Daylight controls and switching

Domestic Hot Water Systems

- New Domestic Water Heater
- Mixing Valves
- New Hot Water Fixtures & Piping

Technology/Fire Alarm/Security

- Wireless Access Points
- Data & Phone Drops
- Data Racks & Labeling
- Interactive White Boards
- Security Cameras
- Card Readers & Door Lock System
- Fire Alarm System

Section G: LIST OF SERVICES

Mechanical Systems Design

- HVAC
- Geothermal
- Solar Thermal
- Plumbing & Fire Protection
- Controls – DDC and Pneumatic

Electrical Systems Design

- Power Distribution & Emergency Power
- Lighting & Controls
- Fire Alarm & Security Systems
- Telecommunications & Sound Systems
- Solar Electric (PV)

Building Commissioning

- Mechanical, Electrical, and Building Envelope Systems
- NYSERDA and LEED Commissioning
- Retro-Commissioning

Energy Assistance/NYSERDA Programs

- FlexTech Energy Audits
- New Construction Program TA Studies
- Facility Benchmarking
- Energy Audits & Lighting Surveys
- Energy Metering and Monitoring

Facility Support

- Energy Management System Optimization
- HVAC System Troubleshooting
- Maintenance Contract Review and Negotiation

Noise and Acoustical Analysis

- Acoustical Design for Critical Spaces
- HVAC System Noise Control
- Environmental Noise Analysis

Environmental and Ecological Services

- Site Analysis and Site Selection
- Wetland Delineation
- Ecological Studies

Section H: BUSINESS INFORMATION AND NOVUS STRENGTHS

Business Form of Contracting Entity

Novus Engineering, P.C. is a Professional Engineering Corporation licensed by the New York State Education Department. Our primary goal is to provide a high level of independent technical and engineering services to our clients. We do not market any equipment or represent any manufacturer, but endeavor to specify products that best meet the needs of our clients.

Why Novus is Most Qualified for the Project

The strengths brought by Novus Engineering to the tasks envisioned in this solicitation include the following:

- We offer a highly capable and experienced team, combining solid competencies in building commissioning, mechanical and electrical engineering and technical analysis, project management, building control systems, building envelope design and analysis, LEED® design and documentation, and building energy modeling.
- The Novus team has, over the course of the last ten years, completed numerous successful commissioning projects that have resulted in immediate cost savings to the client as well as long term operational and maintenance savings.
- The Novus team has in-depth experience with building control systems, including detailed pre-implementation evaluation of sequences of operation. We are skilled with using digital control systems during the commissioning process to evaluate system functionality, helping to ensure that buildings operate according to design intent.
- The Novus team has extensive experience with load and building modeling. If tasked with preparing building energy load models in commissioning, Novus will aggressively pursue correct equipment sizing to control up-front costs and optimize system efficiency over the life of the building.
- The Novus team has a strong operational sensitivity and a keen awareness that facility staff must understand building systems after the consultants have gone home. This awareness is critical during the commissioning process to assure that all installed systems are accessible and maintainable over the long term.
- The Novus team has a proven track record of long standing for providing informed and dependable commissioning assistance to clients in all sectors. We have received consistently

positive feedback on the caliber and thoroughness of our work. We have also established our ability to meet tight deadlines and produce high quality work in a cost-effective manner.

- As detailed in our resumes in Section E, the Novus team has strong qualifications in the areas outlined in this RFP. Our staff expertise is well suited to the purpose of providing commissioning to the District. Staff experience ranges over a continuum, and the team can readily match task difficulty to staff assignment. The range of staff experience will permit Novus to provide cost effective services to the District. We also pride ourselves on working efficiently to meet client schedules and needs.

In summary, Novus offers the Schodack Central School District the opportunity to maximize the effectiveness of its investment in this contract by engaging a firm with the experience and expertise to ensure timely and successful implementation of contract tasks.



CERTIFICATE OF LIABILITY INSURANCE

NOVUS-1

OP ID: BJ

DATE (MM/DD/YYYY)

06/29/2016

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Bryant Asset Protection, Inc 1280 New Scotland Road Slingerlands, NY 12159 Jeffrey C. Bryant, CPCU		CONTACT NAME: Jeffrey C. Bryant, CPCU PHONE (A/C, No, Ext): 518-439-1141 FAX (A/C, No): 518-475-0030 E-MAIL ADDRESS:		
INSURED Novus Engineering, P.C. Mark J. Bagdon, P.E. 25 Delaware Ave Delmar, NY 12054		INSURER(S) AFFORDING COVERAGE		NAIC #
		INSURER A: The Netherlands Insurance Co.		24171
		INSURER B: Scottsdale Insurance Co.		41297
		INSURER C: Peerless Insurance Company		24198
		INSURER D: The Charter Oak		25615
		INSURER E: Excelsior Insurance Co.		11045
INSURER F: ShelterPoint Life				

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSD WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input checked="" type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> OCCUR		BOP9611392	05/15/2016	05/15/2017	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 50,000
B	<input checked="" type="checkbox"/> Professional Liab		VRS 0002166	05/19/2016	05/19/2017	MED EXP (Any one person) \$ 5,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 1,000,000 Prof Liab \$ 2M/2M
	GEN'L AGGREGATE LIMIT APPLIES PER: <input checked="" type="checkbox"/> POLICY <input type="checkbox"/> PRO-JECT <input type="checkbox"/> LOC OTHER:					
B	AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO <input type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS		BA8075120	05/15/2016	05/15/2017	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
D	<input checked="" type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED <input checked="" type="checkbox"/> RETENTION \$ 10000		CU9620169	05/15/2016	05/15/2017	EACH OCCURRENCE \$ 3,000,000 AGGREGATE \$ 3,000,000 \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input type="checkbox"/> N/A	XHUB 3910T07 5 16	05/15/2016	05/15/2017	PER STATUTE <input type="checkbox"/> OTH-ER <input type="checkbox"/> E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
A	Business Owner		BOP9611392	05/15/2016	05/15/2017	BUILDING 592,098
F	NYS Disability		D1892999 STATUTORY	11/03/2015	11/03/2016	PROPERTY 329,135

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Evidence of Insurance.

Workers' compensation policy is endorsed for "all states" coverage with the exception of monopolistic states Washington, Ohio, North Dakota, Wyoming and Arkansas.

CERTIFICATE HOLDER

CANCELLATION

EVIDENC Evidence of Insurance	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

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Section J: LOCAL PARTICIPATION

Novus Engineering, P.C. is an active participant in the Capital Region business marketplace. The bulk of our projects are located within a 50-mile radius of Albany. Our office in Delmar is our sole location, and all of our 17 professional staff are based there, and live in the Capital Region. We have enjoyed good relationships and repeat business with local institutions, building owners, construction managers, and property management firms. Repeat clients include Siena College, Bard College, Union College, RPI, Turner Construction, BBL Construction, Picotte Companies, SUNY Albany, NYS Dormitory Authority and others. Novus has successfully carried out engineering projects for local and regional educational and health care institutions, including several local school districts and charter schools.

Novus is an active member of the Bethlehem Chamber of Commerce. We are underwriters of Tri-Village Little League, the Delmar Community Orchestra, and the Albany CROP Hunger Walk, among other community endeavors. Novus Engineering is committed to the economic health and vibrancy of New York's Capital Region and its citizens.

BID FORM – FEE PROPOSAL
SCHODACK CENTRAL SCHOOL DISTRICT
Fundamental Commissioning Services

Date: June 30, 2016

SUBMITTED BY:

Company Name: (Bidder) Address:

Novus Engineering, P.C.

The Bidder, in compliance with the Invitation to Bid for the Project, having examined the RFP and specified documents, and being familiar with the site of the proposed Work and with all of the conditions surrounding the site of the proposed Work, including the availability of labor, and equipment, hereby proposes to furnish all labor, materials, tools, equipment, machinery, equipment rental, transportation, superintendence, and miscellaneous items to provide all Fundamental Commissioning Services for the complete performance of the Scope of Work in the category stated below. By submitting this Bid Form, the Bidder accepts and agrees to the Subcontract Agreement, Attachments, Construction Documents and Addendums included herein without modification.

SCOPE IDENTIFICATION

This Bid includes the following scope(s) of Work listed in RFP.

LUMP SUM BID:

FUNDAMENTAL COMMISSIONING SERVICES BASE BID, EXCLUDING SALES TAXES (LUMP SUM), Reimbursable Expenses are to be included in base bid.

DOLLARS (\$ 91,500)

ESTIMATED REIMBURSABLE EXPENSES TO PERFORM THE SERVICES DESCRIBED WITHIN LUMP SUM ABOVE. NO MARK-UP WILL BE ACCEPTED FOR REIMBURSABLE EXPENSES, THIS WILL BE A NOT TO EXCEED VALUE.

DOLLARS (\$ 1,200)

FOR ACCOUNTING PURPOSES, PLEASE PROVIDE A BREAKOUT OF THE LUMP SUM BID FOR FUNDAMENTAL COMMISSIONING SERVICES INTO THE FOLLOWING CATEGORIES:

FUNDAMENTAL COMMISSIONING

Commissioning Principal Hourly Rate Dollars (\$ 145)

Commissioning Associate Hourly Rate Dollars (\$ 125)

Commissioning Engineer Hourly Rate Dollars (\$ 80)

Work Week: Novus' standard work week is 40 hours. However, all Novus employees are salaried and required to work whatever hours are necessary to complete their assignments. Any preapproved out-of-scope services would be billed at the hourly rates shown above.

PRELIMINARY DRAFT Commissioning Plan

**Schodack Central School District
Maple Hill High School
1216 Maple Hill Road, Castleton on Hudson, NY**

District Wide Renovations, Safety & Security and Technology Project

June 30, 2016

(This is an abbreviated preliminary draft of a commissioning plan, for inclusion with Novus' proposal for reference only. Once Novus is hired and the commissioning specifications are finalized, a more detailed version of this plan will be prepared for review by the Owner, Design Team, and Construction Manager. A draft commissioning schedule will also be prepared once additional discussions are held with the Owner and CM.)

I. Introduction and Roles

A. Overview of Commissioning (Cx) Process

1. General Project Information

The Schodack Central School District is pursuing a renovation project at Maple Hill High School. The project includes upgrades and replacements of the following system types: HVAC, Building Control Systems, Lighting and controls, security systems, fire alarm, and technology systems (data/phone, etc). Commissioning services will be provided for this new work as detailed in the project commissioning specifications. Renovation work is scheduled to occur from (INSERT DATE) through (INSERT DATE).

2. Goals and Objectives of Cx Process

- a) The objective of Cx is to confirm and document that the building fulfills the functional and performance requirements of the Owner, occupants and operators.
- b) The Cx process will verify and document compliance with the owner's performance requirements and designer's intent throughout the construction, start-up, and initial period of operation.
- c) The Commissioning Authority (CxA) will develop, coordinate and carry out a testing plan which includes observing and documenting installation and

performance of all commissioned systems to ensure that they are functioning in accordance with the Owner's objectives and the designer's intent.

- e) Commissioning will be conducted following ASHRAE Guidelines for mechanical systems and any additional requirements outlined in the project Specification Section 018100.

3. List of Commissioned Systems

Mechanical Systems

- (TBD – pending development of commissioning specifications)

Electrical Systems

- (TBD)

Plumbing Systems

- (TBD)

Security/Fire Alarm/Technology Systems

- (TBD)

B. Commissioning Participants and Responsibilities

1. Novus Engineering – Commissioning Authority (CxA)

Novus Engineering ("Novus") will prepare the Cx plan and coordinate Cx activities of project participants. Novus will collect and review documentation required under the Cx process, coordinate pre-functional and functional testing activities, review start-up activities, verify training has taken place, review O&M manuals for completeness, and develop a final commissioning report. Novus' responsibilities are further discussed in Section III, *Outline of Cx Process and CxA Responsibilities*.

2. Turner Construction –Construction Manager (CM)

- Prepare and update the project schedule with input from the CxA and contractors.
- Coordinate project submittal review.

- Provide daily site coordination and inspection to assure that the project is constructed in compliance with the plans and specifications.
- Assist in coordination of systems start-up.
- Assist in scheduling of testing and balancing and functional testing.
- Furnish copies of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxA.
- Coordinate the resolution of non-compliance and deficiencies identified in all phases of Cx.
- Ensure that all contractors execute their Cx responsibilities according to this document and the project specifications.
- Assist the CxA as necessary in seasonal or deferred testing and deficiency corrections.
- Ensure that Contractors complete all required pre-functional checklists, correct deficiencies, respond to questions, and provide staff to assist the CxA with functional testing and make necessary adjustments to O&M manuals.
- Schedule owner training and review training agenda, in conjunction with the CxA.
- Review Warranty documentation.
- Provide any design narrative and sequence documentation requested by the CxA. The designers, along with the Contractors, shall assist in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.

3. Synthesis & MH Professional Engineering, PLLC – Architect/Engineer of Record

- Prepare project plans, specifications, and controls sequences of operation.
- Provide any design narrative and sequences documentation or clarifications requested by the CxA. Assist in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings, control sequences or equipment documentation is not sufficient for writing detailed testing procedures or being accurately implemented by the controls contractor. Perform normal submittal review, construction observation, etc., as contracted.
- Communicate with the CxA during the submittal review process to address all questions and deficiencies and provide clear direction to contractors.
- Review pre-functional inspection checklists and functional performance testing protocols developed by the CxA. Provide clear written comments to the CxA prior to documents being finalized.
- Review and sign-off on Testing and Balancing reports when deficiencies have been corrected to Engineer's satisfaction. Assist the CxA as necessary to identify and direct correction of deficiencies.
- Review and approve the O&M manuals.

- Participate in the resolution of system deficiencies identified in all phases of commissioning.
- Provide timely responses to questions raised by contractors and the CxA in order to facilitate the commissioning process.

4. (TBD) - Mechanical Contractor (MC)

- Provide additional requested documentation, prior to normal O&M manual submittals, to the CxA for development of startup and functional testing procedures.
- Provide equipment as specified on project documents.
- Provide the CM with submittals for commissioned equipment.
- Install equipment as specified on project documents.
- Provide assistance to CxA during pre-functional checkout process.
- Coordinate start-up planning with CxA.
- Notify CxA when equipment is ready for start-up and pre-functional checklists have been completed and are ready for inspection.
- Schedule equipment start-up in advance so that the CxA may be present if requested. Perform equipment start-up and report any deficiencies to the CxA and CM. Provide written start-up reports to the CxA for review in a timely fashion.
- Schedule testing and balancing. Notify CxA of schedule in advance so that an on-site meeting can be held to review TAB measurement and documentation procedures.
- Provide hands-on assistance to CxA during functional testing. The CxA will direct testing and will rely upon the contractor to demonstrate system functionality for certain tests.
- Assist in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
- Correct problems identified during functional testing and notify the CM when systems are ready for re-testing.
- Provide all O&M manuals, as needed. Make changes to O&M manuals based on comments provided by CxA, CM, Owner or A/E.
- Provide training to the Owner's operating staff. Training shall be scheduled in advance with the Owner and CxA and a written agenda shall be provided for all parties to review ahead of time.

5. (TBD) - Controls Sub-contractor (CC)

- Provide additional requested documentation, prior to normal O&M manual submittals, to the CxA for development of startup and functional testing procedures.
- Provide equipment as specified on project documents.
- Install equipment as specified on project documents.
- Meet with CxA at the beginning of the point-to-point checkout process to review procedures.
- Execute point-to-point checkout of control system and submit report to CxA. CxA will review checkout documentation and will randomly spot check results.
- Program BMS to follow Engineer's sequence of operation, the Owner's Project Requirements, and Basis of Design.
- Assist in system start-up and balancing, as requested by the MC and TAB agent.
- Assist in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
- Assist CxA in executing functional testing protocols.
- Modify sequences of operation as required so that systems perform as intended.

6. (TBD) - Electrical Contractor (EC)

- Provide equipment as specified on project documents.
- Provide the CM with submittals for commissioned equipment.
- Install equipment as specified on project documents.
- Provide assistance to CxA during pre-functional checkout process.
- Correct any non-compliant systems.
- Execute system start-up.
- Provide hands-on assistance during functional testing.
- Correct problems identified during functional testing.
- Provide training to the Owner's operating staff.

7. (TBD) - Plumbing Contractor (PC)

- Provide equipment as specified on project documents.
- Provide the CM with submittals for commissioned equipment.
- Install equipment as specified on project documents.
- Provide assistance to CxA during pre-functional checkout process.
- Correct any non-compliant systems.
- Execute system start-up.
- Provide hands-on assistance during functional testing.

- Correct problems identified during functional testing.
- Provide training to the Owner's operating staff.

8. (TBD) – Technology Systems Vendors

- (TBD pending specification development)

II. Management, Communication and Reporting during Commissioning Process

Management of the Cx process will be carried out by the CxA in close coordination with the CM. The CxA and CM will confer regularly on Cx activities to be carried out during the course of construction. Final coordination of Cx activities will be confirmed by email to all parties. Reports and checklists from contractors shall be submitted jointly to the CM and to the CxA.

Management and reporting procedures are further discussed in Section III, *Outline of Cx Process and CxA Responsibilities*.

III. Outline of Cx Process and CxA Responsibilities

A. Pre-Construction & Cx Kickoff

1. Prepare and distribute Cx Plan, including list of equipment to be commissioned, commissioning procedures and responsibilities, and general commissioning schedule.
2. Hold kick-off commissioning meeting to review Cx process and procedures with construction team.
3. Review submittals for equipment to be commissioned, including shop drawings for mechanical and electrical systems. Verify that all equipment meets the standards outlined in the plans and specifications.
4. Review written sequences of operation prepared by Engineer. Report any concerns to Engineer regarding clarity or ability to implement. Confer with Engineer to resolve concerns.
5. Review written sequences of operation submitted by the controls contractor. Verify that sequences are consistent with the engineer's sequence. Identify inconsistencies or potential problems and provide comments to the engineer and controls contractor. Assist in the resolution of identified issues and review final submitted sequence.

B. Pre-Functional Testing

1. Hold periodic Cx meetings, as needed, to review construction progress and discuss commissioning procedures and issues.
2. Develop pre-functional and startup checklists, incorporating manufacturer's start-up procedures as appropriate. Distribute to Owner, Engineer, CM and contractors for review.
3. Make periodic site visits to review overall quality of installation of equipment, e.g. all units in correct location, capacities correct, all specialties present and correctly installed, acceptable piping and ductwork construction, maintenance access provided, control device locations appropriate, etc. Confirm general conformance with plans and specifications.
4. Distribute an updated issues log following each site visit (as needed) to describe any identified deficiencies. Note the status of issues reported in prior logs.
5. Review hydronic flushing and testing procedures and observe system flushing, as appropriate.
6. Review duct pressure test procedures and confer with testing and balancing contractor to review balancing plan and approach.
7. Review completion of pre-functional checklists and spot-check accuracy of completed items during site visits. Follow-up as required on outstanding deficiencies.
8. Verify that all checklist and critical issues have been addressed prior to start-up.

C. Start-up Review

1. Review start-up procedures and schedule with CM and contractors.
2. Provide sign-off that commissioned systems are ready for start-up.
3. Witness start-up of selected equipment; note any issues and report to CM and Owner.
4. Collect and review start-up reports prepared by contractors and factory representatives. Provide comments to CM as necessary.
5. Review testing and balancing report and report deficiencies to CM. Coordinate correction of deficiencies and retest as required.

6. Meet with controls contractor (CC) during point-to-point checkout to observe procedures, discuss issues, and review functional testing procedures.
7. Obtain copies of the controls contractor's completed point-to-point checkout forms in order to verify acceptable testing of control devices and wiring. Identify any omissions, deficiencies, or questionable results and review with the contractor. Spot check results as needed.

D. Functional Performance Testing

1. Prepare functional performance test protocols for each piece of equipment within the commissioning scope of work. Submit test forms to Owner, Engineer and contractors for comments and revise as necessary.
2. Perform functional performance tests. Utilize both functional testing forms and commissioning issues log to identify and track deficiencies.
 - a) HVAC Systems – Test proper start-up and shutdown of each system in response to automatic and manual control, modify loads to verify proper response to capacity modulation, check-out emergency and failure modes, generation of alarms, and interlocks with other equipment. Confirm programming and function of systems satisfies the approved sequences of operation. Verify correct ventilation and exhaust airflow rates are achieved.
 - b) Lighting – Check lighting levels in spaces for conformance with design. Check operation of lighting controls, emergency lighting systems, schedules and controls for outdoor lighting systems.
3. Functional Testing of Control System
 - a) Obtain and review point-to-point controls checkout documentation from CC. Discuss any outstanding issues and direct corrections before beginning functional testing.
 - b) Perform site visit with CC to review controls installation and to observe gross system function and stability. Identify any observed problems.
 - c) Inspect operation of controlled systems to verify proper operation according to the Engineer's sequence of operation.
 - d) Spot-check sensor accuracy and stability. Identify any issues such as temperature stability, VFD stability, or short cycling of equipment.
 - e) Check occupied and unoccupied modes for proper operation and equipment shutdown.

- f) Verify that all schedules have been installed per Owner requirements.
- g) Set up BMS trends of various parameters. Inspect trend data and compare performance with design expectations.
- h) Notify CC about issues identified and jointly determine corrective course of action.
- i) Re-test after corrective action.
- j) Repeat steps (c) through (i) as necessary until system functions as intended.

E. Documentation and Training

- 1. Maintain Cx activity and deficiency log, functional testing checklists, and field inspection reports as described above.
- 2. Review O&M documentation for completeness and proper organization. Submit comments to CM for corrective action and resubmission by the appropriate contractor(s).
- 3. Review training schedule and procedures. Submit comments to contractors for modification of training program and resubmission. Verify that training has been completed in a manner satisfactory to the Owner.

F. Reporting

- 1. Prepare Cx Summary Report. The report shall contain the following sections:
 - a) Executive Summary of Cx process including observations, conclusions and outstanding items.
 - b) Copy of Commissioning Plan.
 - c) Copies of completed pre-functional checklists.
 - d) Summary of functional testing and results.
 - e) Description of system deficiencies encountered and how issues were resolved.
 - f) Summaries of design review, submittal review, O&M documentation and training processes.

2. Submit draft report to Owner, Engineer and CM for review. Revise and resubmit as necessary.
3. Prepare systems manual in accordance with project requirements and submit to Owner.

G. Commissioning Schedule

1. A commissioning schedule will be developed in collaboration with the CM once this preliminary plan is further developed into a draft plan to be submitted for review. This schedule will include the major activities, durations and dates associated with the commissioning process. Novus will work with the CM to integrate necessary commissioning activities into the overall project schedule and will review subsequent schedule updates to ensure that commissioning activities are properly accounted for and adequate time for completion provided.

End of Commissioning Plan

Background notes

7/25/16

7) a. Building commissioning is a quality-focused process. Normally the initial commissioning team and a team leader (typically known as the commissioning authority or CA) is involved from project initiation through one year of occupancy. When a building is initially commissioned it undergoes an intensive quality assurance process that begins during design and continues through construction, occupancy, and operations. Commissioning ensures that the new building operates initially as the owner intended and that the building staff are prepared to operate and maintain its systems and equipment. The commissioning process main goal is to improve a project from the design phase through post construction and occupancy.