SPECIFICATIONS

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS HUDSON AREA SCHOOLS

March 9, 2012

DAILEY ENGINEERING, INC.

ENGINEER'S SEAL

TODD DAILEY
Licensed Engineer
Michigan Registration #33565

BIDDING REQUIREMENTS, CONTRACT FORMS AND CONDITIONS OF THE CONTRACT

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END OF SECTION 00005

Hudson Area Schools will receive sealed bid proposals for Architectural and Electrical construction trade work from qualified contractors for the **2012 Architectural & Electrical Renovations to Lincoln Elementary School, High School/Middle School and Thompson Field.** A pre-bid meeting and project walk-through will be conducted on Monday, March 19 at 3:00 pm at the High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

The provisions of the Michigan Prevailing Wage Act **will** apply on this project.

Proposals may be mailed or delivered in person to Mr. Michael Osborne, Superintendent of Hudson Area Schools, c/o Hudson Area Schools, 781 N Maple Grove Ave, Hudson, Michigan 49247. Proposals must be received **prior to 3 p.m. on Friday, March 30, 2012,** at which time Proposals will be opened publicly and read aloud at the High School Media Center, 771 N. Maple Ave, Hudson, MI. All bids will be evaluated after the bid opening. All bids received **after** the bid receipt deadline may at the discretion of the Owner, be returned unopened.

The Project will utilize separate prime contracts. All contracts for construction will be direct contracts with the Owner. Overall administration of the Project will be the responsibility of the Project Engineer, Dailey Engineering, Inc. The Owner will award contracts beginning on or about April 16, 2012, to separate contractors for separate bid divisions or combinations of bid divisions. A Bidder may submit a proposal on more than one bid division; however, a separate bid must be submitted for each bid division of a combined bid. All bids shall be submitted on the bid forms provided in the project specifications and completed in accordance with the project specifications. Facsimile bids **will not** be accepted.

All Project procedures and documents are designed to facilitate delivery of the Project through multiple prime construction contracts. The Owner's forms, rather than industry master forms, are used for all documents. The Bidders shall read and review the Bidding Documents carefully, and familiarize themselves thoroughly with all requirements.

Requests by **Contractors** for inclusion as Bidders shall be addressed to Todd Dailey, Dailey Engineering, phone: 517/467-9000. **Bid Documents will be available March 9, 2012 at no cost via an FTP site. Contact Dailey Engineering at todddailey@me.com or calling 517-467-9000 to request information on how to access the FTP site.** Hardcopy documents are available for a $200 non-refundable fee. All questions regarding the bidding procedures, design, and drawing/specification intent are to be directed to Todd Dailey, Dailey Engineering, phone: 517/467-9000.

A Bid Security in the amount of five percent (5%) of Base Bids shall accompany each proposal or proposal combination. The Bid Security may be in the form of a Bid Bond, Cashier's Check, or Money Order. Bids may not be withdrawn for a period of thirty (30) days after the bid date. Successful bidders may be required to furnish Surety Bonds as stated in the project specifications.

All bidders shall provide familial disclosure in compliance with MCL 380.1267. All bids shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Owner or any employee of the bidder and any member of the Board of Education of the Hudson Area Schools, or the superintendent of the Hudson Area Schools. A form will be enclosed in the specification's booklet under section 00305 that shall be used for this purpose.

The Project Completion Date is August 17, 2012.

The Owner reserves the right to reject any or all proposals, accept a bid other than the low Bid, and to waive informalities, irregularities and/or errors in the bid proposals which they feel to be in their own best interest.

End of Notice

PART I **GENERAL**

1.01 DEFINITIONS

A. The Owner is Hudson Area Schools.

B. The Project Team consists of the Owner; the Engineer, Dailey Engineering Inc.; and other design professionals providing services in connection with the Project.

C. The Project is 2012 Architectural & Electrical Renovations.

D. Work is any portion of the Project.

E. The Bidding Documents include (as applicable to project):

1. The Notice to Bidders.
2. The Instructions to Bidders.
3. Bid Division Descriptions.
4. Proposal Forms.
5. Sample Contract Forms.
6. The Specifications for the Project.
7. The Drawings for the Project.
8. All Addenda issued.
9. The Preliminary Milestone Schedule.

F. Addenda are written and/or graphic instruments issued by the Engineer: Dailey Engineering, which add to, delete from, clarify, or correct the Bidding Documents.

G. Bids are sums stipulated in Proposal for which Bidders propose to perform the Work of Bid Divisions.

H. Base Bids are sums stipulated in Proposals for which Bidders offer to perform the Work of Bid Divisions, and which Alternate Bids may be added to or deleted from.

I. Alternate Bids are sums which may be added to or deleted from Base Bids for the performance of Alternate Work, as delineated in the Bidding Documents.

J. Unit Prices are sums included in proposals as Bids per unit measure of materials and/or services, as required in the Bidding Documents.

K. Proposals are complete, properly executed forms including Base Bids, Alternate Bids, Unit Prices and other information requested by the Owner.

L. Bidders are contractors who submit proposals to the Owner for Work as Prime Contractors on the Project.

M. Bid Divisions are the divisions of Work into which the Project is divided for bidding. Bid Divisions shall not be confused with Technical Specification Divisions.

M. Bid Division Descriptions (Section 00309) are written descriptions of the Work included in the Bid Divisions.

1.02 MULTIPLE PRIME CONTRACTS/BID DIVISIONS

A. This is an Owner Represented Project. There is no General Contractor. All contracts awarded on this Project will be prime contracts. The Owner will award contracts for each Bid Division and/or for groups of Bid Divisions. An Owner's Representative will administrate the Project.

B. Although each Bid Division involves an obvious and recognizable segment of "conventional" trade contracting, multiple contract project delivery requires that adjustments be made to permit the completion of each Bid Division as a separate segment of construction. Each Bidder shall carefully review the total scope of their responsibilities with respect to the Work of his Bid Division(s), and shall provide for the total scope in their Proposal.

C. Bid Division Descriptions (Section 00309) have been written to clearly delineate each Bid Division. The Owner will not be responsible for a Bidder's interpretation of the Descriptions. Bidders are encouraged to request information by calling Todd Dailey, Dailey Engineering Inc., 8465 Stephenson Road, Onsted, Michigan 49265, (517) 467-9000.

D. For the purpose of clarity, the scope of work for each Bid Division may be divided into three categories: "INCLUDED," "ALSO INCLUDED," and "EXCLUDED."

1. Information provided under the heading "EXCLUDED" is for the purpose of indicating beginning and termination points, and/or to provide an understanding of fringe involvement included in Bid Divisions. (Information under this heading is not always necessary to delineate a Bid Division.)

2. Items listed under "INCLUDED" are the obvious and/or "conventional" work scope of each Bid Division.

3. Information provided under "ALSO INCLUDED" points out some items which may be considered less obvious or "unconventional," but which are included in the work scope of a particular Bid Division. (Information under this heading is not always necessary to delineate a Bid Division.)

E. Nothing contained in the Bidding Documents, including the Bid Division Descriptions, shall be construed by Bidders as an assignment of work to any construction industry trade. Each Bidder is responsible for their own work assignments when making their Proposal.

1.03 INTERFACING BID DIVISIONS

A. Each Bidder shall familiarize himself with the work scopes of all Bid Divisions which interface with his own. Each Bidder shall consider that the work of his Bid Division(s) may follow the work of another Division or other Divisions, and that other Contractors may perform work after the work of his Bid Division(s), and that other Contractors may work simultaneously with the work of his own Bid Division(s). Each Bidder shall include provisions for such interfaces and for cooperation with interfacing Contractors in his Proposal.

1.04 PRE-BID CONFERENCE

A. The Owner and other members of the project Team will be present to answer Bidders' questions regarding the Project, and to provide information to Bidders. Bidders are required to attend. See Notice to Bidders (Section 00010) for time and location.

1.05 BIDDING DOCUMENTS

A. Bidders have received sets of Bidding Documents. Requests from Bidders for additional sets of Bidding Documents will be honored under the conditions set forth in the Notice to Bidders (Section 00010).

B. Since bidders have been furnished with electronic copies of the Bid Documents, hard copies are only available for a non-refundable fee of $200.

C. Bidders shall use complete sets of Bidding Documents in preparing Proposals. Bidders are responsible for ascertaining that the Bidding Documents upon which their Proposals are based are complete sets. Be aware that many drawings include color. Copies from a black and white plotter will lack full content, and should not be used.

D. Bidding Documents are provided to Bidders for uses pertaining to bidding only. No other use is permitted.

E. Bidders shall promptly notify the Project Team of any ambiguities, inconsistencies, errors and omissions they may discover in the Bidding Documents.

F. Requests from Bidders for clarification or interpretation of the Bidding Documents will be received by the Project Team through the date of the Pre-Bid Meeting.

G. Changes and corrections to the Bidding Documents will be made by Addendum, distributed to the Bidders by regular mail.

H. Each Bidder shall ascertain prior to submitting his Proposal that he has considered every Addendum issued prior to the Bid Date, and shall acknowledge receipt of each Addendum in his Proposal in writing.

1.06 PRELIMINARY MILESTONE SCHEDULE

A. A Preliminary Milestone Schedule has been developed by the Owner's Representative and supplied to the Bidders. Each Bidder is required to review the dates indicated in that Schedule, and either to endorse or to amend them within the context of the Bid Division(s) he is bidding. Space is provided on the Proposal Forms for endorsement or amendment.

B. The milestone dates as endorsed and/or amended by successful bidders and accepted by the Owner will be used in the development of a Master Schedule to be used as a guide during the construction of the Project.

C. Each Bidder is obligated to comment on the Milestone Schedule if, in his opinion, the dates do not depict realistic time interval(s) for performance of the Work of his Bid Division(s). However since the overall construction period is limited to the summer school break, there is little room for schedule adjustments.

D. The effect of endorsements and amendments on the Milestone Schedule will be considered when selecting Bidders for contract awards.

1.07 BID SECURITY

A. Bid Security is required for this Project. Refer to section 00410.

1.08 SUBSTITUTIONS

A. The materials, products, and equipment described in the Bidding Documents establish a standard of quality required function, dimension and appearance which shall be met by all substitutions.

B. Bidders desiring to include substitutions for items specified in the Bidding Documents are encouraged to submit written requests for such proposed substitutions to the Project Team. It is incumbent upon the Bidder to ensure that such requests are received by the Project Team prior to the Bid date. Each substitution request should include a complete description of the proposed substitute including drawings, cuts, performance and test data, the name of the material or equipment for which it is to be substituted, and any other information necessary for evaluation. A statement setting forth any changes in other materials, equipment or Work that incorporation of the substitute would require also should be included. The burden of proof of the merit of the proposed substitute is upon the Bidder. The Engineer's approval or disapproval of a proposed substitution shall be final.

1.09 VOLUNTARY ALTERNATES/VALUE ENGINEERING SUGGESTIONS

A. Base Bids and Alternate Bids shall be based on the Bidding Documents including approved substitutions, and on the Bidders' evaluations of the Project Site. However, the Owner invites Voluntary Alternates or Value Engineering Suggestions consistent with the intent of the Bidding Documents. Such Alternates and Suggestions, if submitted, shall be incorporated into Proposals by describing Voluntary Alternate, on company letterhead, attached to the Bid Proposal Form.

1.10 BID OPENING AND CONTRACT AWARDS

A. Bids will be opened publicly after the time and date established for receipt of Proposals. Bid Summaries will be made available to Bidders by request after the Bid Date, but not before Post Bid Interviews have been conducted.

B. Contract awards will be based on Bidders' Proposals and ability to perform. The Owner intends to award contracts to Bidders who submit proper Proposals in accord with the requirements of the Bidding Documents. All awards will be made in the Owner's best interest.

C. Decisions regarding Bidder's abilities affecting contract awards will be made by the Owner.

D. The Owner reserves the right to waive any informality or irregularity in any Proposal.

E. The Owner reserves the right to reject any Proposal.

1.11 POST-BID INTERVIEWS

A. Bidders in contention for contract awards may be asked to attend Post-Bid Interviews and submit post-bid submittals in rough draft for review.

1.12 POST-BID SUBMITTALS

A. Bidders who have been notified of the Owner's intent to award a contract shall submit the following items to the Engineer:

1. A Schedule of Values utilizing the level of detail requested by the Owner (Section 00510),
2. A list of all subcontractors and suppliers, to be used, and all items of material and equipment to be incorporated into the Project (Section 00680),
3. The names of the on-site supervisor(s) whom the Bidder proposes to employ to accomplish the Work (Section 00690).

4. Sample copies of construction contracts are included in Section 00700.

1.13 OWNER'S RIGHT TO APPROVE SUPPLIERS, SUBCONTRACTORS, MATERIAL, EQUIPMENT AND EMPLOYEES

A. Bidders will be required to establish to the satisfaction of the Owner the reliability and responsibility of proposed employees, suppliers and subcontractors, and the suitability of proposed materials and equipment.

B. Prior to the award of a contract, the Owner's Representative will notify the Bidder if the Owner has reasonable and substantial objection to any person, organization, material or equipment listed by the Bidder. If the Owner has a reasonable and substantial objection, the Bidder shall amend his Proposal by providing an acceptable substitute. The Owner may, at his discretion, accept such a substitute, or he may disqualify the Proposal.

C. Suppliers, subcontractors, employees, materials and equipment proposed by the Bidder and accepted by the Owner shall be used on the Work for which they are proposed and accepted, and shall not be changed except with the written approval of the Owner.

1.14 BONDS

A. Refer to Section 00600 for information regarding bonding requirements.

1.15 INSURANCE

A. Refer to Sections 00650 and 00700 for information regarding insurance requirements.

PART 2 - FORMS FOR BIDDING

2.0 PROPOSAL FORMS

A. Bidders are required to use the forms provided by the Owner for Bidding purposes.

B. Sample form(s) and instructions appear in Section 00305.

PART 3 - PROCEDURES AND CONDITIONS FOR BIDDING

3.01 COMPLETION OF PROPOSAL FORMS

A. Refer to Section 00300 for detailed instructions regarding completion of Proposal Forms.

3.02 SUBMISSION OF PROPOSALS

A. Proposals shall be submitted to the Owner, at the location stated in the Notice to Bidders, Section 00010.

B. Proposals shall be submitted by the time and date stated in the Notice to Bidders, Section 00010.

C. Bidders shall bear full responsibility for delivering Proposals to the location for receipt of Proposals by the time and date for receipt of Proposals.

3.03 MODIFICATION OR WITHDRAWAL OF PROPOSALS

A. A Proposal may not be modified, withdrawn or canceled by the Bidder within thirty (30) days following the time and date designated for the receipt of Proposals, and the Bidder so agrees in submitting his Proposal.

B. Prior to the time and date designated for receipt of Proposals, Proposals may be modified or withdrawn. Modifications and withdrawals shall be in writing or by telegram. If by telegram, written confirmation shall have been mailed and postmarked before the date and time set for receipt of Proposals. Telegraphic communications shall be worded so that the amounts of the original Proposals are not revealed.

C. Withdrawn Proposals may be resubmitted up to the time and date designated for receipt of Proposals.

3.04 BIDDERS' REPRESENTATIONS & ACKNOWLEDGMENTS

A. In submitting his Proposal, each Bidder Represents that:

1. He has read and understands the Bidding Documents.
2. His Proposal is made in accord with the Bidding Documents.
3. He has visited the Project Site and has familiarized himself with the local conditions under which the Work he is bidding will be performed.
4. He will accept contract award, regardless of the identity of other Contractors on the Project.
5. During contract performance, he will not interrupt his Work nor impede the progress of other Contractors as a result of prejudice based on sex, race, color, creed, labor affiliation, or lack of labor affiliation of Contractors or employees of Contractors engaged on this Project.

B. In submitting his Proposal each Bidder acknowledges:

1. The rights of the Owner to accept or reject any Proposal, to waive any informality or irregularity in any Proposal received, and to accept other than a low Bid.
2. The right of the Owner to accept any combination of Bid Divisions he desires.
3. The right of the Owner to award contracts in his own interest.

3.05 OTHER INFORMATION

A. All Bidders shall comply with the requirements of the Bidding Documents, Addenda and all applicable codes, laws, and regulations in preparing and submitting Proposals.

B. All bidders shall comply with Michigan’s Prevailing Wage Act. (See rate schedules attached to this section). The Contractor awarded the project will be required to submit a sworn statement stating specifically that the Contractor and all of the sub contractor’s on the project are complying with the Prevailing Wage Act. Additionally, weekly certified payroll records will be furnished upon owner’s request.

C. Refer to Sections 00300 for additional instructions regarding Proposals.

RICK. SNYDER
GOVERNOR

STATE OF MICHIGAN

Prevailing Wages
PO Box 30476
Lansing, MI 48909
517-322-1825

Informational Sheet: Prevailing Wages on State Projects

REQUIREMENTS OF
THE PREVAILING WAGES ON STATE PROJECTS ACT, PUBLIC ACT 166 OF 1965

The State of Michigan determines prevailing rates pursuant to the Prevailing Wages on State Projects Act, Public Act 166 of 1965, as amended. The purpose of establishing prevailing rates is to provide minimum rates of pay that must be paid to workers on construction projects for which the state or a school district is the contracting agent and which is financed or financially supported by the state. By law, prevailing rates are compiled from the rates contained in collectively bargained agreements which cover the locations of the state projects. The official prevailing rate schedule provides an hourly rate which includes *wage and fringe benefit totals* for designated construction mechanic classifications. The overtime rates also include *wage and fringe benefit totals*. Please pay special attention to the overtime and premium pay requirements. Prevailing wage is satisfied when wages plus fringe benefits paid to a worker are equal to or greater than the required rate.

State of Michigan responsibilities under the law:

- The department establishes the prevailing rate for each classification of construction mechanic ***requested by a contracting agent*** prior to contracts being let out for bid on a state project.

Contracting agent responsibilities under the law:

- If a contract is not awarded or construction does not start within 90 days of the date of the issuance of rates, a re-determination of rates must be requested by the contracting agent.
- Rates for classifications needed but not provided on the Prevailing Rate Schedule, ***must*** be obtained ***prior*** to contracts being let out for bid on a state project.
- The contracting agent, by written notice to the contractor and the sureties of the contractor known to the contracting agent, may terminate the contractor's right to proceed with that part of the contract, for which less than the prevailing rates have been or will be paid, and may proceed to complete the contract by separate agreement with another contractor or otherwise, and the original contractor and his sureties shall be liable to the contracting agent for any excess costs occasioned thereby.

Contractor responsibilities under the law:

- Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing rates prescribed in a contract.
- Every contractor and subcontractor shall keep an accurate record showing the name and occupation of and the actual wages and benefits paid to each construction mechanic employed by him in connection including certified payroll, as used in the industry, with said contract. This record shall be available for reasonable inspection by the contracting agent or the department.
- Each contractor or subcontractor is separately liable for the payment of the prevailing rate to its employees.
- The prime contractor is responsible for advising all subcontractors of the requirement to pay the prevailing rate prior to commencement of work.
- The prime contractor is secondarily liable for payment of prevailing rates that are not paid by a subcontractor.
- A construction mechanic *shall only* be paid the apprentice rate if registered with the United States Department of Labor, Bureau of Apprenticeship and Training and the rate is included in the contract.

Enforcement:

A person who has information of an alleged prevailing wage violation on a state project may file a complaint with the State of Michigan. The department will investigate and attempt to resolve the complaint informally. During the course of an investigation, if the requested records and posting certification are not made available in compliance with Section 5 of Act 166, the investigation will be concluded and a referral to the Office of Attorney General for civil action will be made. The Office of Attorney General will pursue costs and fees associated with a lawsuit if filing is necessary to obtain records.

RICK. SNYDER
GOVERNOR

MIOSHA
Michigan Occupational Safety and Health Administration

STATE OF MICHIGAN

Prevailing Wages
PO Box 30476
Lansing, MI 48909
517-322-1825

Informational Sheet: Prevailing Wages on State Projects

General Information Regarding Fringe Benefits

Certain fringe benefits **may** be credited toward the payment of the Prevailing Wage Rate:

- If a fringe benefit is paid directly to a construction mechanic
- If a fringe benefit contribution or payment is made on behalf of a construction mechanic
- If a fringe benefit, which may be provided to a construction mechanic**,** is pursuant to a written contract or policy
- If a fringe benefit is paid into a fund, for a construction mechanic

When a fringe benefit is not paid by an hourly rate, the hourly credit will be calculated based on the annual value of the fringe benefit divided by 2080 hours per year (52 weeks @ 40 hours per week).

The following is an example of the types of fringe benefits allowed and how an hourly credit is calculated:

Vacation	40 hours X $14.00 per hour = $560/2080 =	$.27
Dental insurance	$31.07 monthly premium X 12 mos. = $372.84 /2080 =	$.18
Vision insurance	$5.38 monthly premium X 12 mos. = $64.56/2080 =	$.03
Health insurance	$230.00 monthly premium X 12 mos. = $2,760.00/2080 =	$1.33
Life insurance	$27.04 monthly premium X 12 mos. = $324.48/2080 =	$.16
Tuition	$500.00 annual cost/2080 =	$.24
Bonus	4 quarterly bonus/year x $250 = $1000.00/2080 =	$.48
401k Employer Contribution	$2000.00 total annual contribution/2080 =	$.96
Total Hourly Credit		$3.65

Other examples of the types of fringe benefits allowed:

- Sick pay
- Holiday pay
- Accidental Death & Dismemberment insurance premiums

The following are examples of items that **will not** be credited toward the payment of the Prevailing Wage Rate

- Legally required payments, such as:
  - Unemployment Insurance payments
  - Workers' Compensation Insurance payments
  - FICA (Social Security contributions, Medicare contributions)
- Reimbursable expenses, such as:
  - Clothing allowance or reimbursement
  - Uniform allowance or reimbursement
  - Gas allowance or reimbursement
  - Travel time or payment
  - Meals or lodging allowance or reimbursement
  - Per diem allowance or payment
- Other payments to or on behalf of a construction mechanic that are not wages or fringe benefits, such as:
  - Industry advancement funds
  - Financial or material loans

State of Michigan
DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS
MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
DOUGLAS KALINOWSKI
DIRECTOR

OVERTIME PROVISIONS for MICHIGAN PREVAILING WAGE RATE COMMERCIAL SCHEDULE

1. Overtime is represented as a nine character code. Each character represents a certain period of time after the first 8 hours Monday thru Friday.

	Monday thru Friday	Saturday	Sunday & Holidays	Four 10s
First 8 Hours		**4**	**8**	**9**
9th Hour	**1**	**5**		
10th Hour	**2**	**6**		
Over 10 hours	**3**	**7**		

Overtime for Monday thru Friday after 8 hours:
the 1st character is for time worked in the 9th hour *(8.1 - 9 hours)*
the 2nd character is for time worked in the 10th hour *(9.1 - 10 hours)*
the 3rd character is for time worked beyond the 10th hour *(10.1 and beyond)*

Overtime on Saturday:
the 4th character is for time worked in the first 8 hours on Saturday *(0 - 8 hours)*
the 5th character is for time worked in the 9th hour on Saturday *(8.1 - 9 hours)*
the 6th character is for time worked in the 10th hour *(9.1 - 10 hours)*
the 7th character is for time worked beyond the 10th hour *(10.01 and beyond)*

Overtime on Sundays & Holidays
The 8th character is for time worked on Sunday or on a holiday

Four Ten Hour Days
The 9th character indicates if an optional 4-day 10-hour per day workweek can be worked ***between Monday and Friday*** **without paying overtime after 8 hours worked, unless otherwise noted in the rate schedule. To *utilize a 4 ten workweek, notice is required from the employer to employee prior to the start of work on the project.***

2. Overtime Indicators Used in the Overtime Provision:
   H - means TIME AND ONE-HALF due
   X - means TIME AND ONE-HALF due after 40 HOURS worked
   D - means DOUBLE PAY due
   Y - means YES an optional 4-day 10-hour per day workweek can be worked without paying overtime after 8 hours worked
   N - means NO an optional 4-day 10-hour per day workweek *can not* be worked without paying overtime after 8 hours worked

LARA is an equal opportunity employer.
Auxiliary aids, services and other reasonable accommodations are available upon request to individuals with disabilities.

Wage & Hour Division
7150 HARRIS DRIVE • P.O. BOX 30476 • LANSING, MICHIGAN 48909
www.michigan.gov/wagehour • Phone : (517) 322-1825

3. EXAMPLES:

HHHHHHHDN - This example shows that the 1½ rate must be used for time worked after 8 hours Monday thru Friday *(characters 1 - 3);* for all hours worked on Saturday, 1½ rate is due *(characters 4 - 7).* Work done on Sundays or holidays must be paid double time *(character 8).* The N *(character 9)* indicates that 4 ten-hour days is not an acceptable workweek at regular pay.

XXXHHHHDY - This example shows that the 1½ rate must be used for time worked after 40 hours are worked Monday thru Friday *(characters 1-3);* for hours worked on Saturday, 1½ rate is due *(characters 4 – 7)*. Work done on Sundays or holidays must be paid double time *(character 8).* The Y *(character 9)* indicates that 4 ten-hour days is an acceptable alternative workweek.

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Wage & Hour Division
7150 HARRIS DRIVE • P.O. BOX 30476 • LANSING, MICHIGAN 48909
www.michigan.gov/wagehour • Phone : (517) 322-1825

ENGINEERS - CLASSES OF EQUIPMENT LIST

UNDERGROUND ENGINEERS

CLASS I

Backfiller Tamper, Backhoe, Batch Plant Operator, Clam-Shell, Concrete Paver (2 drums or larger), Conveyor Loader (Euclid type), Crane (crawler, truck type or pile driving), Dozer, Dragline, Elevating Grader, End Loader, Gradall (and similar type machine), Grader, Power Shovel, Roller (asphalt), Scraper (self propelled or tractor drawn), Side Broom Tractor (type D-4 or larger), Slope Paver, Trencher (over 8' digging capacity), Well Drilling Rig, Mechanic, Slip Form Paver, Hydro Excavator.

CLASS II

Boom Truck (power swing type boom), Crusher, Hoist, Pump (1 or more 6" discharge or larger gas or diesel powered by generator of 300 amps or more, inclusive of generator), Side Boom Tractor (smaller than type D-4 or equivalent), Tractor (pneu-tired, other than backhoe or front end loader), Trencher (8' digging capacity and smaller), Vac Truck.

CLASS III

Air Compressors (600 cfm or larger), Air Compressors (2 or more less than 600 cfm), Boom Truck (non-swinging, non-powered type boom), Concrete Breaker (self-propelled or truck mounted, includes compressor), Concrete Paver (1 drum, ½ yard or larger), Elevator (other than passenger), Maintenance Man, Mechanic Helper, Pump (2 or more 4" up to 6" discharge, gas or diesel powered, excluding submersible pump), Pumpcrete Machine (and similar equipment), Wagon Drill Machine, Welding Machine or Generator (2 or more 300 amp or larger, gas or diesel powered).

CLASS IV

Boiler, Concrete Saw (40HP or over), Curing Machine (self-propelled), Farm Tractor (w/attachment), Finishing Machine (concrete), Firemen, Hydraulic Pipe Pushing Machine, Mulching Equipment, Oiler (2 or more up to 4", exclude submersible), Pumps (2 or more up to 4" discharge if used 3 hrs or more a day-gas or diesel powered, excluding submersible pumps), Roller (other than asphalt), Stump Remover, Vibrating Compaction Equipment (6' wide or over), Trencher (service) Sweeper (Wayne type and similar equipment), Water Wagon, Extend-a-Boom Forklift.

HAZARDOUS WASTE ABATEMENT ENGINEERS

CLASS I

Backhoe, Batch Plant Operator, Clamshell, Concrete Breaker when attached to hoe, Concrete Cleaning Decontamination Machine Operator, Concrete Pump, Concrete Paver, Crusher, Dozer, Elevating Grader, Endloader, Farm Tractor (90 h.p. and higher), Gradall, Grader, Heavy Equipment Robotics Operator, Hydro Excavator, Loader, Pug Mill, Pumpcrete Machines, Pump Trucks, Roller, Scraper (self-propelled or tractor drawn), Side Boom Tractor, Slip Form Paver, Slope Paver, Trencher, Ultra High Pressure Waterjet Cutting Tool System Operator, Vactors, Vacuum Blasting Machine Operator, Vertical Lifting Hoist, Vibrating Compaction Equipment (self-propelled), and Well Drilling Rig.

CLASS II

Air Compressor, Concrete Breaker when not attached to hoe, Elevator, End Dumps, Equipment Decontamination Operator, Farm Tractor (less than 90 h.p.), Forklift, Generator, Heater, Mulcher, Pigs (Portable Reagent Storage Tanks), Power Screens, Pumps (water), Stationary Compressed Air Plant, Sweeper, Water Wagon and Welding Machine.

State of Michigan

WHPWRequest@michigan.gov

Official Request #: 149
Requestor: Hudson Area Schools
Project Description: Renovations
Project Number:

Lenawee County

Official 2012 Prevailing Wage Rates for State Funded Projects

Issue Date: 2/2/2012
Contract must be awarded by: 5/2/2012

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Asbestos & Lead Abatement Laborer						
Asbestos & Lead Abatement Laborer 4 ten hour days @ straight time allowed Monday-Saturday, must be consecutive calendar days	MLDC	9/26/2011	$37.95	$50.75	$63.54	H H H X X X X D Y
Asbestos & Lead Abatement, Hazardous Material Handler						
Asbestos and Lead Abatement, Hazardous Material Handler 4 ten hour days @ straight time allowed Monday-Saturday,	AS207	9/26/2011	$37.95	$50.85	$63.75	H H H X X X X D Y
Boilermaker						
Boilermaker	BO85	3/28/2008	$47.24	$70.27	$93.29	H H H H H H H D N
	Apprentice Rates:					
	1st 6 months		$30.47	$45.11	$59.75	
	2nd 6 months		$31.22	$46.24	$61.25	
	3rd 6 months		$39.72	$58.99	$78.25	
	4th 6 months		$40.47	$60.11	$79.75	
	5th 6 months		$41.22	$61.24	$81.25	
	6th 6 months		$42.73	$63.51	$84.27	
	7th 6 months		$44.23	$65.75	$87.27	
	8th 6 months		$45.74	$68.02	$90.29	
Bricklayer						
Bricklayer, Stone Mason, Artificial Masonry, Pointer, Cleaner, Caulker	BR9-3-BL	8/19/2010	$42.13	$55.23	$68.33	H H H X H H H D Y
	Apprentice Rates:					
	0-749 hours		$31.65	$39.51	$47.37	
	750-1499 hours		$32.96	$41.47	$49.99	
	1500-2249 hours		$34.27	$43.44	$52.61	
	2250-2999 hours		$35.58	$45.41	$55.23	
	3000-3749 hours		$36.89	$47.37	$57.85	
	3750-4499 hours		$38.20	$49.33	$60.47	
	4500-5249 hours		$39.51	$51.30	$63.09	
	5250-6000 hours		$40.82	$53.27	$65.71	

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Carpenter						
Floor layer	CA1004FL	9/15/2011	$35.06	$45.21	$55.35	H H H H H H H D N
	Apprentice Rates:					
	1st Year		$26.94	$33.03	$39.11	
	2nd Year		$28.97	$36.07	$43.17	
	3rd Year		$31.00	$39.11	$47.23	
	4th Year		$32.02	$40.65	$49.27	
Carpenter	CA1004J	9/15/2011	$38.52	$50.36	$62.19	H H H H H H H D Y
Four 10s allowed Monday-Thursday. Friday make up day for inclement weather. Hours worked on Friday except for inclement weather make up shall be paid at time and one half.						
	Apprentice Rates:					
	1st Year		$29.05	$36.15	$43.25	
	2nd Year		$31.42	$39.71	$47.99	
	3rd Year		$33.79	$43.26	$52.73	
	4th Year		$34.97	$45.03	$55.09	
Cement Mason						
Cement Mason	BR9-3-CM	8/19/2010	$40.97	$53.17	$65.37	H H D X H H D D Y
	Apprentice Rates:					
	0-749 hours		$32.43	$40.36	$48.29	
	750-1499 hours		$33.65	$42.19	$50.73	
	1500-2249 hours		$34.87	$44.02	$53.17	
	2250-2999 hours		$36.09	$45.85	$55.61	
	3000-3749 hours		$37.31	$47.68	$58.05	
	3750-4499 hours		$38.53	$49.51	$60.49	
Cement Mason	PL886-CM	9/4/2007	$40.90	$54.60	$68.29	H H D H H D D D N
	Apprentice Rates:					
	1st 6 months		$28.57	$36.10	$43.63	
	2nd 6 months		$31.31	$40.21	$49.11	
	3rd 6 months		$34.05	$44.32	$54.59	
	4th 6 months		$35.42	$46.37	$57.33	
	5th 6 months		$36.79	$48.43	$60.07	
	6th 6 months		$38.16	$50.49	$62.81	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Drywall						
Drywaller	PL886-DR	9/5/2007	$37.82	$50.83	$63.83	H H H X H H H D N
	Apprentice Rates:					
	1st 6 months		$24.81	$31.31	$37.81	
	2nd 6 months		$26.12	$33.27	$40.43	
	3rd 6 months		$27.42	$35.23	$43.03	
	4th 6 months		$30.02	$39.13	$48.23	
	5th 6 months		$31.32	$41.07	$50.83	
	6th 6 months		$32.62	$43.03	$53.43	
	7th 6 months		$35.22	$46.93	$58.63	
	8th 6 months		$36.52	$48.87	$61.23	
Drywall Taper	PT-22-D	10/15/2009	$41.70	$54.58	$67.45	H H D H D D D D N
	Apprentice Rates:					
	First 3 months		$28.83	$35.27	$41.71	
	Second 3 months		$31.40	$39.13	$46.85	
	Second 6 months		$33.97	$42.98	$51.99	
	Third 6 months		$36.55	$46.85	$57.15	
	4th 6 months		$37.84	$48.79	$59.73	
Electrician						
Road Way Electrical Work Double time due after 16 hours on any calendar day and all hours Sunday.	EC-17	5/31/2011	$48.61	$70.50	$92.39	H H H H H H H D Y
	Apprentice Rates:					
	1st 6 months		$31.11	$44.26	$57.38	
	2nd 6 months		$33.30	$47.52	$61.76	
	3rd 6 months		$35.48	$50.81	$66.14	
	4th 6 months		$37.68	$54.08	$70.51	
	5th 6 months		$39.86	$57.38	$74.89	
	6th 6 months		$44.23	$63.94	$83.64	
Teledata Journeyman Installer Technician Four tens may be worked any 4 consecutive days Monday thru Friday.	EC-8	9/29/2011	$38.78	$58.17	$77.56	H H H H H H H D Y
	Apprentice Rates:					
	1st Period		$19.16	$28.75	$38.32	
	2nd Period		$22.08	$33.13	$44.16	
	3rd Period		$31.85	$47.78	$63.70	
	4th Period		$33.24	$49.86	$66.48	
	5th Period		$34.62	$51.93	$69.24	
	6th Period		$36.01	$54.02	$72.02	

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Lineman/Technician outside utility and commercial power and high voltage pipe type cable work and electrical underground.	EC-876	11/18/2009	$47.05	$68.11	$89.17	H H H H H H H D Y
Four 10s allowed Monday-Thursday with Friday makeup or Tuesday-Friday with Monday makeup.						
	Apprentice Rates:					
	1st period		$30.20	$42.69	$55.26	
	2nd period		$32.32	$46.02	$59.70	
	3rd period		$34.42	$49.16	$63.90	
	4th period		$36.53	$52.33	$68.12	
	5th period		$38.63	$55.47	$72.32	
	6th period		$40.74	$58.64	$76.54	
	7th period		$42.84	$61.79	$80.74	
Subdivision of county	Adrian, Blissfield, Cambridge, Deerfield, Dover, Fairfield, Franklin, Hudson, Madison, Medina, Ogden, Palmyra, Raisin, Ridgeway, Riga, Rollin, Rome, Seneca, Tecumseh, & Woodstock townships					
Inside Wireman	EC-8-IW	8/11/2011	$53.18	$79.77	$106.36	H H H X H H H D Y
Four consecutive 10 hour days may be worked at the straight time rate of pay Mon-Fri. Sat may be used as a make up day when work was canceled due to weather conditions.						
	Apprentice Rates:					
	Period 1		$21.50	$32.26	$43.00	
	Period 2		$25.38	$38.07	$50.76	
	Period 3		$31.51	$47.27	$63.02	
	Period 4		$35.84	$53.76	$71.68	
	Period 5		$40.18	$60.27	$80.36	
	Period 6		$44.51	$66.77	$89.02	
Teledata Cable Puller	EC-8-TC	9/29/2011	$13.37	$20.06	$26.74	H H H H H H H D Y
Four tens may be worked any 4 consecutive days Monday thru Friday.						
Elevator Constructor						
Elevator Constructor Mechanic	EL-44	1/10/2012	$71.67		$114.73	D D D D D D D D Y
	Apprentice Rates:					
	1st year		$49.53		$73.21	
	2nd year		$54.26		$82.25	
	3rd year		$56.62		$86.76	
	4th year		$61.35		$95.80	

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Classification Name / Description			Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Elevator Constructor Mechanic		EL-85	1/12/2011	$65.80		$109.78	D D D D D D D D Y
	Apprentice Rates:						
	1st year			$46.01		$70.20	
	2nd year			$50.41		$79.00	
	3rd year			$52.61		$83.40	
	4th year			$57.00		$92.18	
Glazier							
Glazier If a four 10 hour day workweek is scheduled, four 10s must be consecutive, M-F.		GL-357	9/12/2011	$45.49	$63.69	$81.88	H H H H H H H D Y
	Apprentice Rates:						
	1st 6 months			$31.13	$42.15	$53.16	
	2nd 6 months			$32.59	$44.34	$56.08	
	3rd 6 months			$35.35	$48.48	$61.60	
	4th 6 months			$36.80	$50.65	$64.50	
	5th 6 months			$38.25	$52.83	$67.40	
	6th 6 months			$39.70	$55.01	$70.30	
	7th 6 months			$41.15	$57.18	$73.20	
	8th 6 months			$44.04	$61.51	$78.98	
Heat and Frost Insulator							
Spray Insulation		AS25S	3/5/2007	$20.14	$29.14		H H H H H H H H N
Heat and Frost Insulator and Asbestos Worker							
Heat and Frost Insulators and Asbestos Workers		AS45	7/1/2008	$48.05	$71.74	$95.42	H H H H H H H D Y
	Apprentice Rates:						
	1st period			$22.62	$33.60	$44.56	
	2nd period			$24.08	$35.78	$47.48	
	3rd period			$29.93	$44.56	$59.18	
	4th period			$31.40	$46.77	$62.12	
	5th period			$32.87	$48.97	$65.06	
	6th period			$34.34	$51.17	$68.00	
	7th period			$39.00	$58.16	$77.32	
	8th period			$40.46	$60.35	$80.24	
	9th period			$41.93	$62.55	$83.18	
	10th period			$43.40	$64.76	$86.12	

Subdivision of county Twps of Blissfield, Clinton, Deerfield, Fairfield, Macon, Ogden, Palmyra, Raisin, Ridgeway, Riga and Tecumseh

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Heat and Frost Insulator and Asbestos Worker 4 ten hour work days shall be either Monday thru Thursday or Tuesday thru Friday	AS47	8/5/2011	$44.15	$58.39	$72.62	H H H H H H H D Y
Apprentice Rates:						
1st year			$25.66	$32.78	$39.90	
2nd year			$29.35	$37.89	$46.43	
3rd year			$33.05	$43.02	$52.98	
4th year			$36.75	$48.14	$59.53	
5th year			$40.45	$53.26	$66.07	
Subdivision of county	Twps of Adrian, Cambridge, Dover, Franklin, Hudson, Madison, Madina, Rollen, Rome, Seneca and Woodstock					
Ironworker						
Ironworker Four tens allowed M-Th. Friday make-up day allowed if M-Th scheduled not worked due to weather conditions or holiday.	IR-55	9/16/2011	$47.03	$70.55	$94.06	H H D X D D D D Y
Apprentice Rates:						
1st year			$23.82	$35.73	$47.64	
2nd year			$38.55	$57.83	$77.10	
3rd year			$41.38	$62.07	$82.76	
4th year			$44.20	$66.30	$88.40	
Metal Fence & Guard Rail Four tens allowed M-Th. Friday make-up day allowed if M-Th scheduled not worked due to weather conditions or holiday.	IR-55-MF	9/16/2011	$37.10	$55.65	$74.20	H H H X H H H D Y
Pre-engineered Metal Building Four tens allowed M-Th. Friday make-up day allowed if M-Th scheduled not worked due to weather conditions or holiday.	IR-55-PE	9/16/2011	$42.31	$63.47	$84.62	H H D X D D D D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Laborer						
Journeyperson - building and heavy construction craft laborer, portable concrete mixer operator, air, electric or gasoline tool operator, hot dope carrier, tar kettle tender, gasoline vibrators, concrete gas buggies, concrete saw, signal person and top person on sewer, caisson construction (open cut work), concrete shoveler, car pusher, and bottom person (on sewer work). Demolition laborer, 3" pumps & below, jobsite clean-up, deep cleaning, jackhammer operators, burner, crock layer, caisson worker, tunnel mucker and tunnel miner, welder, mason tender, mortar mixer, scaffold builder, forklift operator (masonry only), helper and tender on work customarily performed by laborers and all laborers working for masonry contractors and plasterer tenders. A 4-10 work week must run 4 consecutive days between Monday and Friday. All hours worked on Saturday except as an inclement weather make-up day, must be paid @ time & one half.	L499-A	9/26/2011	$32.46	$42.74	$53.02	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 hours		$27.32	$35.03	$42.74	
	1,001-2,000 hours		$28.35	$36.58	$44.80	
	2,001-3,000 hours		$29.38	$38.12	$46.86	
	3,001-4,000 hours		$31.43	$41.20	$50.96	
High Burner A 4-10 work week must run 4 consecutive days between Monday and Friday. All hours worked on Saturday except as an inclement weather make-up day, must be paid @ time & one half.	L499D	9/26/2011	$33.46	$44.24	$55.02	H H H H H H H D Y
Ground burner A 4-10 work week must run 4 consecutive days between Monday and Friday. All hours worked on Saturday except as an inclement weather make-up day, must be paid @ time & one half.	L499J	9/26/2011	$32.96	$43.49	$54.02	H H H H H H H D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Laborer - Hazardous						
Class A - performing work in conjunction with site preparation and other preliminary work prior to actual removal, handling, or containment of hazardous waste substances not requiring use of personal protective equipment required by state or federal regulations; or a laborer performing work in conjunction with the removal, handling, or containment of hazardous waste substances when use of personal protective equipment level "D" is required.	LHAZ-Z4-A	10/21/2011	$32.46	$45.81	$59.15	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$27.71	$38.68	$49.65	
1,001-2,000 work hours			$28.66	$40.11	$51.55	
2,001-3,000 work hours			$29.61	$41.53	$53.45	
3,001-4,000 work hours			$31.51	$44.38	$57.25	
Class B - performing work in conjunction with the removal, handling, or containment of hazardous waste substances when the use of personal protective equipment levels "A", "B" or "C" is required.	LHAZ-Z4-B	10/21/2011	$33.46	$47.31	$61.15	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$28.46	$39.81	$51.15	
1,001-2,000 work hours			$29.46	$41.31	$53.15	
2,001-3,000 work hours			$30.46	$42.81	$55.15	
3,001-4,000 work hours			$32.46	$45.81	$59.15	
Laborer Underground - Tunnel, Shaft & Caisson						
Class I - Tunnel, shaft and caisson laborer, dump man, shanty man, hog house tender, testing man (on gas), and watchman.	LAUCT-Z2-1	10/14/2011	$33.77	$44.74	$55.70	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$28.73	$37.18	$45.62	
1,001-2,000 work hours			$29.73	$38.68	$47.62	
2,001-3,000 work hours			$30.74	$40.19	$49.64	
3,001-4,000 work hours			$32.76	$43.23	$53.68	
Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder	LAUCT-Z2-2	10/14/2011	$33.86	$44.87	$55.88	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$28.79	$37.27	$45.74	
1,001-2,000 work hours			$29.81	$38.80	$47.78	
2,001-3,000 work hours			$30.82	$40.31	$49.80	
3,001-4,000 work hours			$32.85	$43.36	$53.86	

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Class III - Air tool operator (jack hammer man, bush hammer man and grinding man), first bottom man, second bottom man, cage tender, car pusher, carrier man, concrete man, concrete form man, concrete repair man, cement invert laborer, cement finisher, concrete shoveler, conveyor man, floor man, gasoline and electric tool operator, gunnite man, grout operator, welder, heading dinky man, inside lock tender, pea gravel operator, pump man, outside lock tender, scaffold man, top signal man, switch man, track man, tugger man, utility man, vibrator man, winch operator, pipe jacking man, wagon drill and air track operator and concrete saw operator (under 40 h.p.).	LAUCT-Z2-3	10/14/2011	$33.96	$45.02	$56.08	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$28.87	$37.39	$45.90	
1,001-2,000 work hours			$29.89	$38.92	$47.94	
2,001-3,000 work hours			$30.90	$40.43	$49.96	
3,001-4,000 work hours			$32.94	$43.49	$54.04	
Class IV - Tunnel, shaft and caisson mucker, bracer man, liner plate man, long haul dinky driver and well point man.	LAUCT-Z2-4	10/14/2011	$34.12	$45.26	$56.40	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$28.99	$37.57	$46.14	
1,001-2,000 work hours			$30.01	$39.10	$48.18	
2,001-3,000 work hours			$31.04	$40.65	$50.24	
3,001-4,000 work hours			$33.09	$43.72	$54.34	
Class V - Tunnel, shaft and caisson miner, drill runner, keyboard operator, power knife operator, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars)	LAUCT-Z2-5	10/14/2011	$34.38	$45.65	$56.92	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.18	$37.85	$46.52	
1,001-2,000 work hours			$30.22	$39.41	$48.60	
2,001-3,000 work hours			$31.26	$40.97	$50.68	
3,001-4,000 work hours			$33.34	$44.09	$54.84	
Class VI - Dynamite man and powder man.	LAUCT-Z2-6	10/14/2011	$34.69	$46.12	$57.54	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.41	$38.20	$46.98	
1,001-2,000 work hours			$30.47	$39.79	$49.10	
2,001-3,000 work hours			$31.52	$41.37	$51.20	
3,001-4,000 work hours			$33.63	$44.53	$55.42	

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Class VII - Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes and flagstones.	LAUCT-Z2-7	10/14/2011	$26.96	$34.52	$42.08	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$23.62	$29.51	$35.40	
1,001-2,000 work hours			$24.29	$30.52	$36.74	
2,001-3,000 work hours			$24.95	$31.51	$38.06	
3,001-4,000 work hours			$26.29	$33.52	$40.74	
Landscape Laborer						
Landscape Specialist includes air, gas, and diesel equipment operator, skidsteer (or equivalent), lawn sprinkler installer on landscaping work where seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintenance of landscape projects occurs. Sundays paid at time & one half. Holidays paid at double time.	LLAN-Z2-A	9/16/2011	$26.05	$35.94	$45.83	X X H X X X H D Y
Skilled Landscape Laborer: small power tool operator, lawn sprinkler installers' tender, material mover, truck driver on when seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintaining of landscape projects occurs Sundays paid at time & one half. Holidays paid at double time.	LLAN-Z2-B	9/16/2011	$21.85	$29.64	$37.43	X X H X X X H D Y
Landscape Laborer: seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintaining of landscape projects occurs Sundays paid at time & one half. Holidays paid at double time.	LLAN-Z2-C	9/16/2011	$13.65	$20.48	$27.30	X X H X X X H D Y
Marble Finisher						
Marble Finisher A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.	BR1-MF	8/11/2009	$41.37	$51.86	$62.34	H H D H D D D D Y
Apprentice Rates:						
Level 1			$18.11	$24.00	$29.89	
Level 2			$19.25	$25.71	$32.17	
Level 3			$25.69	$32.40	$39.12	
Level 4			$27.09	$34.50	$41.92	
Level 5			$28.53	$36.15	$43.77	
Level 6			$30.07	$38.06	$46.06	
Level 7			$31.68	$39.73	$47.79	
Level 8			$33.10	$41.42	$49.74	

Official Request #: 149
Requestor: Hudson Area Schools
Project Description: Renovations

Project Number:
County: Lenawee

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Marble Mason						
Marble Mason	BR1-MM	8/11/2009	$47.85	$61.58	$75.30	H H D H D D D D Y
A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.						
	Apprentice Rates:					
	Level 1		$23.92	$31.19	$38.47	
	Level 2		$26.83	$34.85	$42.87	
	Level 3		$31.79	$40.02	$48.26	
	Level 4		$34.40	$43.55	$52.69	
	Level 5		$36.55	$45.94	$55.33	
	Level 6		$40.04	$51.10	$62.16	
	Level 7		$40.67	$51.90	$63.14	
	Level 8		$41.56	$53.24	$64.92	
Operating Engineer						
Crane with boom & jib or leads 120' or longer	EN-324-A120	8/5/2011	$54.01	$71.10	$88.18	H H D H D D D D Y
Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.						
Crane with boom & jib or leads 140' or longer	EN-324-A140	8/5/2011	$54.83	$72.33	$89.82	H H D H D D D D Y
Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.						
Crane with boom & jib or leads 220' or longer	EN-324-A220	8/5/2011	$55.13	$72.78	$90.42	H H D H D D D D Y
Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.						

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Crane with boom & jib or leads 300' or longer Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-A300	8/5/2011	$56.63	$75.03	$93.42	H H D H D D D D Y
Crane with boom & jib or leads 400' or longer Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-A400	6/9/2011	$58.13	$77.28	$96.42	H H D H D D D D Y
Compressor or welding machine Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-CW	8/8/2011	$43.16	$54.82	$66.48	H H D H D D D D Y
Forklift, lull, extend-a-boom forklift Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-FL	8/8/2011	$50.47	$65.79	$81.10	H H D H D D D D Y
Fireman or oiler Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-FO	8/8/2011	$42.13	$53.28	$64.42	H H D H D D D D Y
Regular crane, job mechanic, concrete pump with boom Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.	EN-324-RC	8/5/2011	$53.15	$69.81	$86.46	H H D H D D D D Y

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Regular engineer, hydro-excavator, remote controlled concrete breaker	EN-324-RE	8/5/2011	$52.18	$68.35	$84.52	H H D H D D D D Y
Four ten hour days may be scheduled Monday-Thursday. Work in excess of 10 hours but less than 12 per day shall be paid at time and one-half. Work in excess of 12 per day shall be paid at double time. When bad weather or holiday occurs during this time, Friday may be scheduled for a minimum of 8 hours.						
Apprentice Rates:						
0-999 hours			$41.87	$53.19	$64.50	
1,000-1,999 hours			$43.49	$55.62	$67.74	
2,000-2,999 hours			$45.12	$58.06	$71.00	
3,000-3,999 hours			$46.73	$60.48	$74.22	
4,000-4,999 hours			$48.35	$62.90	$77.46	
5,000-5,999 hours			$49.96	$65.32	$80.68	
Operating Engineer - Marine Construction						
Diver/Wet Tender, Engineer (hydraulic dredge)	GLF-1	1/12/2011	$59.91	$78.51	$97.11	X X H H H H H D Y
Holiday pay= $115.71 per hour, wages & fringes						
Subdivision of county all Great Lakes, islands therein, & connecting & tributary waters						
Crane/Backhoe Operator, 70 ton or over Tug Operator, Mechanic/Welder, Assistant Engineer (hydraulic dredge), Leverman (hydraulic dredge), Diver Tender	GLF-2	1/12/2011	$58.41	$76.26	$94.11	X X H H H H H D Y
Holiday pay = $111.96 per hour, wages & fringes						
Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters						
Deck Equipment Operator, Machineryman, Maintenance of Crane (over 50 ton capacity) or Backhoe (115,000 lbs or more), Tug/Launch Operator, Loader, Dozer on Barge, Deck Machinery	GLF-3	1/12/2011	$54.51	$70.41	$86.31	X X H H H H H D Y
Holiday pay = $102.21 per hour, wages & fringes						
Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters						
Deck Equipment Operator, (Machineryman/Fireman), (4 equipment units or more), Off Road Trucks, Deck Hand, Tug Engineer, & Crane Maintenance 50 ton capacity and under or Backhoe 115,000 lbs or less, Assistant Tug Operator	GLF-4	1/12/2011	$49.16	$62.39	$75.61	X X H H H H H D Y
Holiday pay = $88.83 per hour, wages & fringes						
Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters						

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Operating Engineer Hazardous Waste Class I						
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection.	EN-324-HWCI-Z2A	1/20/2012	$50.13	$65.29	$80.45	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.						
	Apprentice Rates:					
	1st 6 months		$40.44	$51.06	$61.67	
	2nd 6 months		$41.96	$53.34	$64.71	
	3rd 6 months		$43.48	$55.62	$67.75	
	4th 6 months		$44.98	$57.87	$70.75	
	5th 6 months		$46.50	$60.15	$73.79	
	6th 6 months		$48.02	$62.43	$76.83	
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing.	EN-324-HWCI-Z2B	1/23/2012	$49.18	$63.87	$78.55	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.						
	Apprentice Rates:					
	1st 6 months		$39.77	$50.05	$60.33	
	2nd 6 months		$41.24	$52.26	$63.27	
	3rd 6 months		$42.70	$54.44	$66.19	
	4th 6 months		$44.18	$56.66	$69.15	
	5th 6 months		$45.65	$58.87	$72.09	
	6th 6 months		$47.11	$61.06	$75.01	
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWCI-Z2D	1/23/2012	$47.88	$61.92	$75.95	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.						
	Apprentice Rates:					
	1st 6 months		$38.86	$48.69	$58.51	
	2nd 6 months		$40.27	$50.80	$61.33	
	3rd 6 months		$41.67	$52.91	$64.13	
	4th 6 months		$43.07	$55.00	$66.93	
	5th 6 months		$44.48	$57.12	$69.75	
	6th 6 months		$45.88	$59.21	$72.55	

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Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWCI-Z2DCL 1/23/2012	$47.63	$61.54	$75.45	H H H H H H H D Y
Apprentice Rates:					
1st 6 months		$38.68	$48.42	$58.15	
2nd 6 months		$40.07	$50.50	$60.93	
3rd 6 months		$41.46	$52.58	$63.71	
4th 6 months		$42.85	$54.67	$66.49	
5th 6 months		$44.25	$56.78	$69.29	
6th 6 months		$45.64	$58.86	$72.07	
Operating Engineer Hazardous Waste Class II					
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWCII-Z2A 1/20/2012	$45.73	$58.69	$71.65	H H H H H H H D Y
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWCII-Z2B 1/23/2012	$44.79	$57.28	$69.77	H H H H H H H D Y
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWCII-Z2D 1/23/2012	$43.49	$55.33	$67.17	H H H H H H H D Y
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWCII-Z2DCL 1/23/2012	$43.24	$54.96	$66.67	H H H H H H H D Y

Classification Name / Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads 140' or longer					
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW140-Z2A 1/20/2012	$52.78	$69.27	$85.75	H H H H H H H D Y
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW140-Z2B 1/23/2012	$51.72	$67.68	$83.63	H H H H H H H D Y
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW140-Z2D 1/23/2012	$50.53	$65.89	$81.25	H H H H H H H D Y
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW140-Z2DCL 1/23/2012	$50.28	$65.52	$80.75	H H H H H H H D Y
Operating Engineer Hazardous Waste Crane w/ Boom & Jib leads 220' or longer					
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW220-Z2A 1/20/2012	$53.08	$69.72	$86.35	H H H H H H H D Y
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW220-Z2B 1/23/2012	$52.04	$68.16	$84.27	H H H H H H H D Y

Classification Name / Description	Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW220-Z2D 1/23/2012	$50.83	$66.34	$81.85	H H H H H H H D Y
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HW220-Z2DCL 1/23/2012	$50.58	$65.97	$81.35	H H H H H H H D Y
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with boom					
Level A - Fully encapsulating chemical resistant suit w/ pressure demand, full face piece SCBA or pressure demand supplied air respirator w/ escape SCBA. The highest available level of respiratory, skin and eye protection. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWRC-Z2A 1/20/2012	$51.10	$66.75	$82.39	H H H H H H H D Y
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with Boom Operator					
Level B & C protection. B - Pressure demand, full face SCBA or pressure demand supplied air respirator w/ escape SCBA w/chemical resistant clothing. C - Full face piece, air purifying canister-equipped respirator w/chemical resistant clothing. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWRC-Z2B 1/23/2012	$50.15	$65.32	$80.49	H H H H H H H D Y
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWRC-Z2D 1/23/2012	$48.85	$63.37	$77.89	H H H H H H H D Y
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats. Four 10 hour days may be worked Monday-Thursday with Friday as a straight-time make up day.	EN-324-HWRC-Z2DCL 1/23/2012	$48.60	$63.00	$77.39	H H H H H H H D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Operating Engineer Steel Work						
Forklift, 1 Drum Hoist	EN-324-ef	10/12/2011	$55.06	$72.80	$90.53	H H D H H H D D Y
Crane w/ 120' boom or longer	EN-324-SW120	10/12/2011	$57.51	$76.47	$95.43	H H D H H H D D Y
Crane w/ 120' boom or longer w/ Oiler	EN-324-SW120-O	10/12/2011	$58.51	$77.97	$97.43	H H D H H H D D Y
Crane w/ 140' boom or longer	EN-324-SW140	10/12/2011	$58.69	$78.24	$97.79	H H D H H H D D Y
Crane w/ 140' boom or longer W/ Oiler	EN-324-SW140-O	10/12/2011	$59.69	$79.74	$99.79	H H D H H H D D Y
Boom & Jib 220' or longer	EN-324-SW220	10/12/2011	$58.96	$78.65	$98.33	H H D H H H D D Y
Crane w/ 220' boom or longer w/ Oiler	EN-324-SW220-O	10/12/2011	$59.96	$80.15	$100.33	H H D H H H D D Y
Boom & Jib 300' or longer	EN-324-SW300	10/12/2011	$60.46	$80.90	$101.33	H H D H H H D D Y
Crane w/ 300' boom or longer w/ Oiler	EN-324-SW300-O	10/12/2011	$61.46	$82.40	$103.33	H H D H H H D D Y
Boom & Jib 400' or longer	EN-324-SW400	10/12/2011	$61.96	$83.15	$104.33	H H D H H H D D Y
Crane w/ 400' boom or longer w/ Oiler	EN-324-SW400-O	10/12/2011	$62.96	$84.65	$106.33	H H D H H H D D Y
Crane Operator, Job Mechanic, 3 Drum Hoist & Excavator	EN-324-SWCO	10/12/2011	$57.15	$75.93	$94.71	H H D H H H D D Y
Apprentice Rates:						
0-999 hours			$45.28	$58.42	$71.57	
1,000-1,999 hours			$47.17	$61.25	$75.34	
2,000-2,999 hours			$49.04	$64.07	$79.09	
3,000-3,999 hours			$50.91	$66.87	$82.83	
4,000-4,999 hours			$52.79	$69.69	$86.59	
5,000 hours			$54.67	$72.51	$90.35	
Crane w/ Oiler	EN-324-SWCO-O	10/12/2011	$58.15	$77.43	$96.71	H H D H H H D D Y
Compressor or Welder Operator	EN-324-SWCW	10/12/2011	$49.70	$64.76	$79.81	H H D H H H D D Y
Hoisting Operator, 2 Drum Hoist, & Rubber Tire Backhoe	EN-324-SWHO	10/12/2011	$56.51	$74.97	$93.43	H H D H H H D D Y
Oiler	EN-324-SWO	10/12/2011	$48.29	$62.64	$76.99	H H D H H H D D Y

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Tower Crane & Derrick where work is 50' or more above first level	EN-324-SWTD50	10/12/2011	$58.24	$77.57	$96.89	H H D H H H D D Y
Tower Crane & Derrick 50' or more w/ Oiler where work station is 50' or more above first level	EN-324-SWTD50-O	10/12/2011	$59.24	$79.07	$98.89	H H D H H H D D Y
Operating Engineer Underground						
Class I Equipment - Backfiller Tamper, Backhoe, Batch Plant Operator, Clamshell, Concrete Paver 2 drums or larger, Conveyor Loader Euclid type, Crane (crawler, truck type or pile driving), Dozer, Dragline, Elevating Grader, endloader, gradall, grader, hydro excavator, power shovel, roller asphalt, scraper self-propelled or tractor drawn, side boom tractor, slip form paver, slope paver, trencher over 8 ft. digging capacity, well drilling rig, concrete pump with boom operator	EN-324A2-UC1	10/13/2011	$47.63	$61.52	$75.40	H H H H H H H D Y
Apprentice Rates:						
0-999 hours			$38.70	$48.42	$58.14	
1,000-1,999 hours			$40.09	$50.50	$60.92	
2,000-2,999 hours			$41.48	$52.59	$63.70	
3,000-3,999 hours			$42.87	$54.68	$66.48	
4,000-4,999 hours			$44.26	$56.76	$69.26	
5,000-5,999 hours			$45.64	$58.83	$72.02	
Class II Equipment - Boom Truck, Crusher, Hoist, Pump 6 inch discharge or larger, side boom tractor, Tractor (pneu-tired other than backhoe or front end loader), Trencher 8 ft. digging capcity and smaller, Vac Truck	EN-324A2-UC2	10/13/2011	$42.74	$54.18	$65.62	H H H H H H H D Y
Class III Equipment - Air Compressors 600 cfm or larger, Air Compressors 2 or more less than 600 dfm, Boom Truck non-swinging non-powered type boom, Concrete Breaker self-propelled or truck mounted, Concrete paver 1 drum 1/2 yd. or larger, Elevator other than passenger, Pump 4 inch to 6 inch discharge, pumpcrete machine, wagon drill, welding machine or generator 2 or more 300 amp or larger	EN-324A2-UC3	10/13/2011	$42.24	$53.43	$64.62	H H H H H H H D Y
Class IV Equipment - Boiler, Concrete Saw 40 hp or over, curing machine self propelled, end dumps, extend a boom forklift, farm tractor with attachment, finishing machine concrete, firemen, hydraulic pipe pushing machine, mulching equipment, oiler, pumps up to 4 inch discharge, roller other than asphalt, stump remover, sweeper wayne type, trencher, vibrating compaction equipment self propelled 6 ft. wide or over, water wagon.	EN-324A2-UC4	10/13/2011	$41.96	$53.01	$64.06	H H H H H H H D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Painter						
Painter (8 hours of repaint work performed on Sunday shall be paid time & one half rate)	PT-22-P	10/15/2009	$39.86	$52.22	$64.57	H H D H D D D D Y
Four 10s allowed Monday-Thursday with Friday makeup day if job down due to weather, holiday or other conditions beyond the control of the employer.						
	Apprentice Rates:					
	First 6 months		$27.51	$33.69	$39.87	
	Second 6 months		$31.21	$39.24	$47.27	
	Third 6 months		$32.45	$41.10	$49.75	
	Fourth 6 months		$33.68	$42.95	$52.21	
	Fifth 6 months		$34.92	$44.81	$54.69	
	Final 6 months		$36.15	$46.65	$57.15	
Pipe and Manhole Rehab						
General Laborer for rehab work or normal cleaning and cctv work-top man, scaffold man, CCTV assistant, jetter-vac assistant	TM247	1/11/2011	$26.50	$35.83		H H H H H H H H N
Tap cutter/CCTV Tech/Grout Equipment Operator: unit driver and operator of CCTV; grouting equipment and tap cutting equipment	TM247-2	1/11/2011	$31.00	$42.58		H H H H H H H H N
CCTV Technician/Combo Unit Operator: unit driver and operator of cctv unit or combo unit in connection with normal cleaning and televising work	TM247-3	1/11/2011	$29.75	$40.70		H H H H H H H H N
Boiler Operator: unit driver and operator of steam/water heater units and all ancillary equipment associated	TM247-4	1/11/2011	$31.50	$43.33		H H H H H H H H N
Combo Unit driver & Jetter-Vac Operator	TM247-5	1/11/2011	$31.50	$43.33		H H H H H H H H N
Pipe Bursting & Slip-lining Equipment Operator	TM247-6	8/4/2011	$32.50	$44.83		H H H H H H H H N
Plasterer						
Plasterer	BR9-3-PCC	8/19/2010	$40.72	$52.99	$65.25	H H H X H H H D Y
	Apprentice Rates:					
	0-749 hours		$32.13	$40.10	$48.07	
	750-1499 hours		$33.36	$41.95	$50.53	
	1500-2249 hours		$34.59	$43.79	$52.99	
	2250-2999 hours		$35.81	$45.62	$55.43	
	3000-3749 hours		$37.04	$47.47	$57.89	
	3750-4499 hours		$38.27	$49.31	$60.35	

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Plasterer	PL886	9/5/2007	$39.33	$53.09	$66.85	H H H X H H H D N
	Apprentice Rates:					
	1st 6 months		$25.57	$32.45	$39.33	
	2nd 6 months		$26.95	$34.52	$42.09	
	3rd 6 months		$28.32	$36.57	$44.83	
	4th 6 months		$31.07	$40.70	$50.33	
	5th 6 months		$32.45	$42.77	$53.09	
	6th 6 months		$33.83	$44.84	$55.85	
	7th 6 months		$36.58	$48.97	$61.35	
	8th 6 months		$37.95	$51.02	$64.09	
Plumber & Pipefitter						
Plumber & Pipefitter	PL-333-RII	12/29/2009	$51.02	$76.33	$101.64	H H H H H H H D Y
Four 10s allowed Monday thru Thursday. Friday not a makeup, considered OT, paid @ time & one-half.						
	Apprentice Rates:					
	1st 6 months		$32.97	$49.26	$65.54	
	2nd 6 months		$34.61	$51.72	$68.82	
	3rd 6 months		$36.25	$54.18	$72.10	
	4th 6 months		$37.89	$56.64	$75.38	
	5th 6 months		$39.53	$59.10	$78.66	
	6th 6 months		$41.17	$61.56	$81.94	
	7th 6 months		$42.82	$64.03	$85.24	
	8th 6 months		$44.46	$66.49	$88.52	
	9th 6 months		$46.10	$68.95	$91.80	
	10th 6 months		$47.74	$71.41	$95.08	
Subdivision of county	EXCEPT the Townships of Clinton, Macon and Tecumseh.					
Plumber, Pipefitter, Welder & HVAC						
Plumber, Pipefitter, Welder & HVAC	PL-190	8/12/2011	$57.05	$80.61	$104.17	H H H H H H H D Y
4 ten hour days may be worked only Monday thru Friday						
	Apprentice Rates:					
	1st Year		$36.02	$49.07	$62.11	
	2nd Year		$39.41	$54.15	$68.89	
	3rd Year		$42.79	$59.22	$75.65	
	4th Year		$46.17	$64.29	$82.41	
	5th Year-1st 6 months		$47.86	$66.83	$85.79	
	5th Year-2nd 6 months		$49.55	$69.36	$89.17	
Subdivision of county	The Townships of Tecumseh, Clinton and Macon ONLY.					

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Official Rate Schedule

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Classification Name / Description			Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Roofer							
Commercial Roofer		RO-134	9/8/2005	$36.79	$48.98	$61.16	H H D X D D D D Y
	Apprentice Rates:						
	1st period			$24.61	$30.70	$36.80	
	2nd period			$25.82	$32.52	$39.22	
	3rd period			$27.04	$34.35	$41.66	
	4th period			$28.26	$36.18	$44.10	
	5th period			$29.48	$38.01	$46.54	
	6th period			$30.70	$39.84	$48.98	
	7th period			$31.92	$41.67	$51.42	
	8th period			$33.13	$43.48	$53.84	
Sewer Relining							
Class I-Operator of audio visual CCTV system including remote in-ground cutter and other equipment used in conjunction with CCTV system.		SR-I	10/14/2011	$41.07	$55.60	$70.12	H H H H H H H D N
Class II-Operator of hot water heaters and circulation system; water jetters; and vacuum and mechanical debris removal systems and those assisting.		SR-II	10/14/2011	$39.54	$53.30	$67.06	H H H H H H H D N
Sheet Metal Worker							
Sheet Metal Worker		SHM-33	11/15/2011	$52.44	$71.11	$89.77	H H D H D D D D Y
	Apprentice Rates:						
	1st Year			$24.77	$32.95	$41.12	
	3rd 6 months			$36.54	$47.26	$57.97	
	4th 6 months			$38.08	$49.57	$61.05	
	5th 6 months			$39.62	$51.88	$64.13	
	6th 6 months			$41.16	$54.19	$67.21	
	7th 6 months			$42.70	$56.50	$70.29	
	8th 6 months			$44.24	$58.81	$73.37	
	9th 6 months			$45.78	$61.12	$76.45	
	10th 6 months			$47.32	$63.43	$79.53	

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Official Rate Schedule

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Sprinkler Fitter						
Sprinkler Fitter	SP 669	9/17/2009	$46.51	$61.99	$77.47	H H H H H H H D Y
	Apprentice Rates:					
	Class 1 & 2		$23.44	$31.31	$39.17	
	Class 3		$29.35	$37.75	$46.15	
	Class 4		$30.93	$40.12	$49.31	
	Class 5		$35.50	$45.47	$55.45	
	Class 6		$37.07	$47.83	$58.59	
	Class 7		$38.65	$50.20	$61.75	
	Class 8		$40.22	$52.55	$64.89	
	Class 9		$41.79	$54.91	$68.03	
	Class 10		$43.36	$57.27	$71.17	
Terrazzo						
Terrazzo Finisher A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.	BR1-TRF	8/11/2009	$41.84	$52.56	$63.28	H H D H D D D D Y
	Apprentice Rates:					
	Level 1		$18.11	$24.00	$29.89	
	Level 2		$19.25	$25.71	$32.17	
	Level 3		$25.69	$32.40	$39.12	
	Level 4		$27.09	$34.50	$41.92	
	Level 5		$28.53	$36.15	$43.77	
	Level 6		$30.07	$38.06	$46.06	
	Level 7		$31.68	$39.73	$47.79	
	Level 8		$33.10	$41.42	$49.74	
Terrazzo Worker A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.	BR1-TRW	8/11/2009	$47.31	$60.77	$74.22	H H D H D D D D Y
	Apprentice Rates:					
	Level 1		$23.92	$31.19	$38.47	
	Level 2		$26.83	$34.85	$42.87	
	Level 3		$31.79	$40.02	$48.26	
	Level 4		$34.40	$43.55	$52.69	
	Level 5		$36.55	$45.94	$55.33	
	Level 6		$40.04	$51.10	$62.16	
	Level 7		$40.67	$51.90	$63.14	
	Level 8		$41.56	$53.24	$64.92	

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Classification Name / Description			Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Tile							
Tile Finisher		BR1-TF		$41.39	$51.89	$62.38	H H D H D D D D Y
A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.			8/11/2009				
	Apprentice Rates:						
	Level 1			$18.11	$24.00	$29.89	
	Level 2			$19.25	$25.71	$32.17	
	Level 3			$25.69	$32.40	$39.12	
	Level 4			$27.09	$34.50	$41.92	
	Level 5			$28.53	$36.15	$43.77	
	Level 6			$30.07	$38.06	$46.06	
	Level 7			$31.68	$39.73	$47.79	
	Level 8			$33.10	$41.42	$49.74	
Tile Layer		BR1-TL		$47.26	$60.69	$74.12	H H D H D D D D Y
A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.			8/11/2009				
	Apprentice Rates:						
	Level 1			$23.92	$31.19	$38.47	
	Level 2			$26.83	$34.85	$42.87	
	Level 3			$31.79	$40.02	$48.26	
	Level 4			$34.40	$43.55	$52.69	
	Level 5			$36.55	$45.94	$55.33	
	Level 6			$40.04	$51.10	$62.16	
	Level 7			$40.67	$51.90	$63.14	
	Level 8			$41.56	$53.24	$64.92	
Truck Driver							
of all trucks of 8 cubic yd capacity or over		TM-RB2	1/26/2011	$38.33	$36.94		H H H H H H H H Y
of all trucks of 8 cubic yard capacity or less		TM-RB2A	1/26/2011	$38.23	$36.79		H H H H H H H H Y
on euclid type equipment		TM-RB2B	1/26/2011	$38.48	$37.16		H H H H H H H H Y
Underground Laborer Open Cut, Class I							
Construction Laborer		LAUC-Z3-1	10/13/2011	$31.71	$41.60	$51.48	H H H H H H H D Y
	Apprentice Rates:						
	0-1,000 work hours			$27.29	$34.97	$42.64	
	1,001-2,000 work hours			$28.17	$36.29	$44.40	
	2,001-3,000 work hours			$29.05	$37.61	$46.16	
	3,001-4,000 work hours			$30.82	$40.27	$49.70	

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Official Rate Schedule

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Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Underground Laborer Open Cut, Class II						
Mortar and material mixer, concrete form man, signal man, well point man, manhole, headwall and catch basin builder, guard rail builders, headwall, seawall, breakwall, dock builder and fence erector.	LAUC-Z3-2	10/13/2011	$31.85	$41.81	$51.76	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$27.39	$35.12	$42.84	
	1,001-2,000 work hours		$28.28	$36.45	$44.62	
	2,001-3,000 work hours		$29.17	$37.79	$46.40	
	3,001-4,000 work hours		$30.96	$40.47	$49.98	
Underground Laborer Open Cut, Class III						
Air, gasoline and electric tool operator, vibrator operator, drillers, pump man, tar kettle operator, bracers, rodder, reinforced steel or mesh man (e.g. wire mesh, steel mats, dowel bars, etc.), cement finisher, welder, pipe jacking and boring man, wagon drill and air track operator and concrete saw operator (under 40 h.p.), windlass and tugger man, and directional boring man.	LAUC-Z3-3	10/13/2011	$31.97	$41.99	$52.00	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$27.48	$35.25	$43.02	
	1,001-2,000 work hous		$28.38	$36.61	$44.82	
	2,001-3,000 work hours		$29.28	$37.95	$46.62	
	3,001-4,000 work hours		$31.07	$40.64	$50.20	
Underground Laborer Open Cut, Class IV						
Trench or excavating grade man.	LAUC-Z3-4	10/13/2011	$32.02	$42.06	$52.10	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$27.52	$35.31	$43.10	
	1,001-2,000 work hours		$28.42	$36.67	$44.90	
	2,001-3,000 work hours		$29.32	$38.01	$46.70	
	3,001-4,000 work hours		$31.12	$40.71	$50.30	
Underground Laborer Open Cut, Class V						
Pipe Layer	LAUC-Z3-5	10/13/2011	$32.16	$42.27	$52.38	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$27.62	$35.47	$43.30	
	1,001-2,000 work hours		$28.53	$36.83	$45.12	
	2,001-3,000 work hours		$29.44	$38.19	$46.94	
	3,001-4,000 work hours		$31.25	$40.91	$50.56	

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Classification Name	Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Underground Laborer Open Cut, Class VI							
Grouting man, top man assistant, audio visual television operations and all other operations in connection with closed circuit television inspection, pipe cleaning and pipe relining work and the installation & repair of water service pipe & appurtenances		LAUC-Z3-6	10/13/2011	$29.46	$38.22	$46.98	H H H H H H H D Y
	Apprentice Rates:						
	0-1,000 work hours			$25.60	$32.43	$39.26	
	1,001-2,000 work hours			$26.37	$33.59	$40.80	
	2,001-3,000 work hours			$27.14	$34.75	$42.34	
	3,001-4,000 work hours			$28.69	$37.07	$45.44	
Underground Laborer Open Cut, Class VII							
Restoration laborer, seeding, sodding, planting, cutting, mulching and topsoil grading and the restoration of property such as replacing mail boxes, wood chips, planter boxes, flagstones etc.		LAUC-Z3-7	10/13/2011	$26.61	$33.95	$41.28	H H H H H H H D Y
	Apprentice Rates:						
	0-1,000 work hours			$23.46	$29.23	$34.98	
	1,001-2,000 work hours			$24.09	$30.17	$36.24	
	2,001-3,000 work hours			$24.72	$31.11	$37.50	
	3,001-4,000 work hours			$25.98	$33.01	$40.02	

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PART 1 GENERAL

1.01 BID DIVISION DESCRIPTIONS

A. Section 00309 contains Bid Division Descriptions. Each Bid Division Description in Section 00309 represents a separate, self-contained Scope of Work. Bid Divisions are the basic divisions of Work into which the Project has been divided for bidding and construction.

PART 2 PROPOSAL FORMAT

2.01 BID PROPOSALS

A. Bidders are required to use the Proposal Forms provided by the Owner. Copies of the Proposal Forms are acceptable.

B. A complete Proposal consists of:

1. The Proposal Form (Section 00305). **SUBMIT TWO (2) COMPLETE COPIES OF YOUR PROPOSAL.**
2. Alternate Pricing Forms (if applicable to this project).

C. Each Proposal shall have a Bid Security attached.

D. All spaces provided on the Proposal forms shall be filled in. If any space provided is not utilized by the Bidder, that space shall be filled in with the notation "NA" (Not Applicable).

E. The Proposal Forms shall be filled in by typewriter or printed manually in ink.

F. Where indicated, all sums shall be expressed in words and figures. **In case of discrepancy, the words shall govern.**

G. Bidders shall not make unsolicited notations or statement on the Proposal Forms. Alteration of the Proposal Forms is not permitted.

H. All changes to and erasures of the Bidder's entries shall be initialed by the signer of the Proposal.

I. Each Proposal shall include the legal name of the Bidder and a statement regarding whether the Bidder is a sole proprietor, a partnership, a corporation, or other type of legal entity. Proposals submitted by corporations shall have the state of incorporation noted, and shall have corporate seals affixed. Any Bid submitted by an agent shall have a current Power of Attorney attached, certifying the agent's power to bind the Bidder.

2.02 ALTERNATES

A. **All requested Alternates shall be bid and all lines filled in or the Proposal will be considered incomplete.**

2.03 PROPOSALS FOR MULTIPLE BID DIVISIONS

A. Each Bidder shall submit two (2) Proposals for each Bid Divisions he is bidding. There is no limit to the number of Bid Divisions any Bidder may bid. **Each Bidder is required to include a separate Bid for each Bid Division he bids in order to be considered for contract award. Spaces are provided in the Proposal Forms to accommodate such combined Proposals.**

B. Multiple Bid Proposals shall contain separate Proposal Forms for each Bid Division being bid.

1. Each Proposal Form shall be fully completed.
2. The Bid for each Bid Division shall be independent of Bids for other Bid Divisions.
3. Bidders shall use the "Combined Bid Deduct" section on the Proposal Form (Section 00305) to finalize multiple Bid Proposals.

PART 3 COMPLETION OF PROPOSAL FORMS AND SEALED BID ENVELOPE

3.01 PROPOSAL FORM (SECTION 00305)

A. Include only one (1) Proposal Form for each Bid Division bid, each Bid Division to be submitted in separate envelope.

B. Fill in the legal name of the Bidder, the address, and the telephone number.

C. Fill in the name and number of the Bid Division covered by the proposal.

D. On the Proposal Form, fill in the Lump Sum Base Bid for the Bid Division. Fill in the amount in both words and figures. Do not include costs for Performance Bonds or Labor/Materials Payment Bonds.

E. Fill in the cost(s) for Performance Bond(s) and Labor and Material Payment Bond(s) in the Amount(s) requested (Section 00600), in the space(s) provided. Fill in the amounts in both words and figures.

F. If Alternate Bids(s) have been requested, fill in the Lump Sum Bid for each Alternate in the space provided. Included costs for Performance Bonds or Labor and Material Payment Bonds in the Lump Sum Bid Alternate total..

G. In the “Combined Bid Deduct” Section, state the amount(s) to be deducted from the total of your Base Bid if you are awarded contracts for more than one Bid Division. State the numbers of the Bid Divisions included in each combination, and the amount to be deducted from the total of all Base Bids in each combination.

H. Fill in name, address and phone number of Surety Company.

I. Fill in the numbers and dates of all Addenda received and considered in the Proposal. Proposals must include acknowledgment of all Addenda issued up to the Bid Date.

J. If Unit Prices have been requested, fill in the Unit Price Bids.

K. Fill in the anticipated number of on-site staff.

L. Fill in the anticipated delivery date(s) of major equipment (such as boilers, unit vents, etc.

M. Fill in the names of the manufacturers, suppliers, and/or subcontractors of indicated items.

N. If you wish to submit Voluntary Alternates or Value Engineering Suggestions, please summarize your suggestions and state the amount to be deducted from the Base Bid.

O. Review the “Bid Division Responsibilities”.

P. Review the “Schedule”.

Q. If the Proposal includes exceptions or substitutions to any part of the Bidding Documents or the Contract Documents, state the exceptions or substitutions in writing on the Proposal Form.

R. Fill in the Bidder's legal name.

S. Indicate the Bidder's status as a sole proprietor, partnership, corporation, or other type of entity.

T. Sign the Proposal Form in the space provided.

U. Type or print the signer's name and title in the spaces provided below the signature.

V. Date the Proposal Form in the space provided.

W. Provide phone number and fax number.

X. Complete the Sworn and Notarized Familial Disclosure Statement using the form provided.

Y. Include references and descriptions of at least three projects.

3.0 SEALED BID ENVELOPE

1. Bids submitted must be sealed, preferably in a 9"x12" manila envelope. Each Bid Division is to be submitted in a separate envelope.

2. Label the sealed bid as follows:

TO: HUDSON AREA SCHOOLS
ATTN: MICHAEL OSBORNE, SUPERINTENDENT
781 N. MAPLE GROVE AVE
HUDSON, MI 49247

Sealed Bid for:
2012 ARCHITECUTRAL & ELECTRICAL RENOVATIONS

Bid Division No.(s): _____

End of Section 00300

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(Bidder's Name)

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 000-2 Security & Technology (Multiple Building Projects)

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 000-2:

200-4: Annex Building Additional Master Clocks Add _____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(Bidder's Name)

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 000-3 Interior Signage (Multiple Building Projects)

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-2 – Electrical – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 100-2:

100-3: Computer Room Cooling Add _____

100-4: Bus Drop-Off Lighting Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(Bidder's Name)

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-3 – General Trades – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 100-3:

100-1: Cafeteria Cavity Wall Flashing Add _____

100-2: Cafeteria Wall Masonry Tuckpointing & Clear Liquid Water Repellant Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-4 – Paving/Site Work – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 100-4:

100-5: Retaining Wall Precast Cap Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-5 – Flooring – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 100-5:

100-9: Gym Sports Floor Replacement Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-6 – Roofing– Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 100-6:

100-8: EPDM Roof Deduct _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-7 – Door Hardware – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 100-8 – Aluminum Doors and Windows – Lincoln Elementary

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 100-8:

100-6: Cafeteria Clerestory Window Replacement Add _____

100-7: 1968 Addition Window Replacement Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-2 – Electrical – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 200-2:

200-4: Annex Building Additional Master Clocks Add _____

200-9: New Bus Parking – Gravel Add/Deduct _____

200-10: New Bus Parking – Paved Add/Deduct_____

200-11: Bus Carport Add _____

200-16: Replace 1600 amp Main Circuit Breaker Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers: Combined Bid Deduct:

_____ _____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-3 – General Trades – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 200-3:

200-7: Replace Stalls at HS Gym Lobby Bathrooms Add _____

200-11: Bus Carport Add _____

200-13:Boiler Room Interior Finishes Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(Bidder's Name)

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-4 – Paving/Site Work – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 200-4:

200-3: Replace Board Office Driveway & Parking Lot Add _____

200-9: New Bus Parking - Gravel Add _____

200-10: New Bus Parking - Paved Add _____

200-12: Exit Driveway Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(Bidder's Name)

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-5 – Flooring – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternates for Bid Division 200-5:

200-14: New Shower Room Tile Flooring Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-6 – Roofing – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 200-6:

200-5: EPDM Roof Deduct _____

200-6: Shingle Roof Replacement Add _____

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247,

Bid Division 200-7 – Door Hardware – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ .00)

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-8 – Aluminum Doors and Windows – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ .00)

COMBINED BID DEDUCT

If awarded a contract for the combined Work of the following combination(s) of the Bid Divisions, the corresponding amount(s) may be deducted from the total(s) of Base Bid(s) for such combination(s) of Bid Divisions.

Bid Division Numbers:	Combined Bid Deduct:
_____	_____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-9 – Theater and Stage Equipment – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ .00)

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 200-10 – Track – High School/Middle School

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____.00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____.00)

Alternates for Bid Division 200-10:

200-1: New Asphalt Base for Track Add _____

200-2: Granulated Rubber Surface for Track Deduct _____

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 300-1 – Visitor's Bleacher Fall Protection Renovations – Thompson Field

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ .00)

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 300-2 – Visitor's Bleacher Painting – Thompson Field

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Project: 2012 Architectural & Electrical Renovations - Hudson Area Schools

Submitted By: _____
(*Bidder's Name)*

Address: _____

City/State/Zip: _____

Phone: _____

Bid Proposal Deadline: Prior to Friday, March 30, 2012, 3 pm at High School Media Center, 771 N. Maple Grove Ave, Hudson, Michigan 49247.

Bid Division 300-3 – Football Field Lighting & Electrical Renovations – Thompson Field

Sports Field Lighting:

BASE BID (not including Labor Bond, Material Bond and Performance Bond Costs):

_____ Dollars and 00/100ths

($ _____ .00)

BOND (cost to provide Labor and Material Payment Bond and Performance Bond on Base Bid):

_____ Dollars and 00/100ths

($ _____ .00)

Alternate 300-1:

Football Field Lighting at 40 Footcandles Deduct _____

Basis for comparison:

A. Contract Price (Equal to Base Bid Amount) $_____

B. 25-Year Life Cycle Operating Cost Total:
(from Section 16521.4, Item H) $_____

C. Total Project Cost (Add Bid item "A" & "B": $_____

SURETY

Name of Surety Company: _____

Address: _____

_____

Phone: _____

ADDENDA

We (the Bidder) acknowledge receipt:

Addendum No._____, dated_____. Addendum No._____, dated_____.

Addendum No._____, dated_____. Addendum No._____, dated_____.

UNIT PRICES

Our unit prices for the following in-place items per this Bid Division are:

Item	Unit	Unit Price

PROJECT INFORMATION

Anticipated number of on-site staff:_____

Anticipated delivery dates(s) of major equipment:_____

Proposed manufacturers, suppliers, and/or subcontractors:

Item	Manufacturer / Subcontractor / Supplier

VOLUNTARY ALTERNATES / VALUE ENGINEERING SUGGESTIONS

We suggest the following alternate procedure(s) and/or material(s):

Summary of Suggestions	Deduct from Base Bid(s)

BID DIVISION RESPONSIBILITY

We recognize that the Scope of the Work within a Bid Division represents a construction segment that is not necessarily restricted to a single construction trade, and our Proposal includes work of all trades required to fully and successfully complete all of the Work required in the Bid Division(s) we have bid.

SCHEDULE

We have reviewed the Preliminary Milestone Schedule and hereby endorse it with regard to the Work of Bid Division(s) we have bid.

EXCEPTIONS AND/OR SUBSTITUTIONS

We have submitted our Proposal complete, as specified, and in accord with the Bidding Documents, including Addenda and the Contract Documents, without exceptions or substitutions, unless otherwise noted on Page 3.

EXECUTION

Name of the Bidder: _____

Bidder's Status: _____Corporation _____Partnership _____Sole Proprietor

_____Other (Please specify: _____)

By/Signature: _____

Name: _____

Title: _____

Date: _____

Phone: _____ Fax:

SWORN AND NOTARIZED FAMILIAL DISCLOSURE STATEMENT

PURPOSE: All bidders shall provide familial disclosure in compliance with MCL 380.1267. The bid shall be accompanied by a sworn and notarized statement disclosing any familial relationship that exists between the Owner or any employee of the bidder and any member of the Board of Education of the Hudson Area Schools, or the superintendent of the Hudson Area Schools. By law, the Hudson Area Schools shall not accept a bid that does not include this sworn and notarized disclosure statement.

INSTRUCTIONS: This form must be completed either in ink or typewritten. Attach pages of this size if additional space is needed.

HUDSON AREA SCHOOLS PERSONNEL LISTING: Hudson Area Schools Board of Education: Rex Murphy, John Enerson, Michael Borton, Marsha Evenson, Ed Engle, Wes Rowan, Jerry Price; Hudson Area Schools Superintendent: Dr. Michael Osborne

DISCLOSURE: The underlined hereby discloses that a familial relationship exists between any member of the Hudson Area Schools Board of Education, or the superintendent of the Hudson Area Schools and the bidder or any employee of the bidder.

The following are the familial relationships:
(If no familial relationships exist, please check the box below, however signature and notary are still required.)

Owner/Employee Name	Related To	Relationship
1._____	_____	_____
2._____	_____	_____
3._____	_____	_____
4._____	_____	_____

☐ No familial relationships exist (check box if applicable).

I, _____,
(name of affiant)

having been duly sworn on oath, say that I am the above-named, that I have personally prepared the foregoing affidavit, and that the same is true to the best of my knowledge and belief.

_____
(signature of affiant)

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

_____
(signature of Notary)

Notary public, State of Michigan, County of _____.

My commission expires _____.

Acting in the County of _____.

2012 RENOVATIONS – HUDSON AREA SCHOOLS

BID DIVISION INDEX

Bid Division – Multiple Building Projects
000-2 Security & Technology
000-3 Interior Signage

Project #1 – Lincoln Elementary
100-2 Electrical
100-3 General Trades
100-4 Paving/Site Work
100-5 Flooring
100-6 Roofing
100-7 Door Hardware
100-8 Aluminum Doors and Windows

Project #2 – High School/Middle School
200-2 Electrical
200-3 General Trades
200-4 Paving/Site Work
200-5 Flooring
200-6 Roofing
200-7 Door Hardware
200-8 Aluminum Doors and Windows
200-9 Theater and Stage Equipment
200-10 Track

Project #3 – Thompson Field
300-1 Visitor's Bleacher Fall Protection Renovations (General Trades Work)
300-2 Visitor's Bleacher Painting
300-3 Football Field Lighting & Electrical Renovations

BID DIVISION DESCRIPTIONS – MULTIPLE BUILDING PROJECTS

Bid Category 000-2: Security & Technology

Includes Specification Sections:
Section 13700 – Security Camera System
Section 13710 – Video Management System
Section 13720 – Digital Video Recorders
Section 13730 – PTZ Cameras
Section 13740 – Dome Interior Cameras
Section 13750 – Dome Exterior Cameras
Section 13760 – Fixed Stick Cameras
Section 16620 - Access Control System
Section 16730 – Wireless Master Clocks
Section 16740 – Intercom System

Drawings showing work for this bid category include:
Cover Sheet A
100-E3.1
200-C1.3
200-E2.2
200-E2.3

Included Work:
1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install new master clock systems.
3. Furnish and install new access control systems.
4. Furnish and install data wiring for new corridor wireless drops.
5. Furnish and install new camera security systems.
6. Furnish and install intercom upgrades.
7. Coordinate with door hardware contractor on access control.
8. Furnish and install all fireproofing sealants where this contractor's work penetrates fire rated walls and ceilings.
9. Furnish and pay for all fees and permits required on this project.
10. Perform all tests associated with the start-up of this system.
11. Coordinate work with Owner's technology contractor.
12. Provide Owner orientation on equipment and systems.
13. Furnish operating and maintenance manuals.
14. Provide continuous housekeeping and cleanup.
15. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:
1. New corridor wireless drop devices are being furnished and installed by Owner's technology contractor.
2. Electrical contractor will convert existing master clock back boxes to a duplex plug-in.

Applicable Alternates:
200-4: Annex Building Additional Master Clocks

2012 RENOVATIONS – HUDSON AREA SCHOOLS

Bid Division Descriptions

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 000-3: Interior Signage

Includes Specification Sections:
Section 10440 – Interior Identification Signage

Drawings showing work for this bid category include:
100-A1.1
100-A2.1
100-A2.2
100-A6.1
200-A1.1
200-A2.2
200-A2.4

Included Work:

1. Provide any field engineering and layout required.
2. Perform all demolition as called for on the design drawings. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
3. Furnish and install all new interior signage.
4. Perform wall-touch up repairs at demo'd signs.
5. Provide continuous housekeeping and cleanup.
6. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Exterior signage is by paving/site contractor.

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

BID DIVISION DESCRIPTIONS – PROJECT #1 – LINCOLN ELEMENTARY

Bid Category 100-2: Electrical

Includes Specification Sections:
Section 16010 - General Electrical Requirements
Section 16210 - Circuit Breakers and Switches
Section 16300 - Raceway Systems
Section 16470 - Panel boards
Section 16500 - Lighting
Section 16600 - Wiring Methods
Section 16950 - Occupancy Sensors

Drawings showing work for this bid category include:
100-C2.1
100-M-D
100-A2.3
100-E1.1
100-E1.2
100-E2.1
100-E2.2
100-E3.1
100-E3.2
100-E3.3

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Install new lighting (interior and exterior).
3. Install new occupancy sensors.
4. Install new power needs.
5. Furnish and install all electrical raceways required.
6. Furnish and install all power and final hook-ups to other equipment supplied by others
7. Provide power hookup to all equipment and items shown on the Architectural, Mechanical and Electrical plans or listed in the Specifications.
8. Any saw cutting of floor slabs for architectural, structural, mechanical and electrical work and removals and replacement of concrete will be by the General Trades Contractor. Electrical trade will coordinate locations with General Trades Contractor.
9. Convert existing master clock back boxes to a duplex plug-in where indicated on the drawings.
10. Furnish and install all fireproofing sealants where this contractor's work penetrates fire rated walls and ceilings.
11. Furnish and pay for all fees and permits required on this project.
12. Perform all tests associated with the start-up of this system.
13. Furnish and install all light poles and bases including the excavation, backfill, compaction, concrete, and grouting of anchor bolts.
14. Coordinate work with Owner's technology contractor.
15. Provide Owner orientation on equipment and systems.
16. Furnish operating and maintenance manuals.
17. Provide continuous housekeeping and cleanup.
18. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Patching at replacement panels will be by the general trades contractor.
2. Gypboard/metal stud construction will be by the general trades contractor.
3.

Applicable Alternates:
100-3: Computer Room Cooling
100-4: Bus Drop-Off Lighting

Consideration for Award:
Successful bidders must:
1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 100-3: General Trades

Includes Specification Sections:
Section 04270 – Unit Masonry
Section 04300 – Exterior Masonry Restoration
Section 07900 – Joint Sealers
Section 08100 – Hollow Metal Doors & Frames
Section 09110 – Metal stud Framing
Section 09260 – Gypsum Board Systems
Section 09500 – Suspended Acoustical Ceilings
Section 09900 - Painting
Section 10170 – Metal Toilet Compartments
Section 10800 – Toilet and Bath Accessories
Section 12300 – Laminate Clad Casework, Countertop & Solid Surface Trim

Drawings showing work for this bid category include:
100-A1.1
100-A1.2
100-A2.1
100-A2.2
100-A2.3
100-A6.1
100-A6.2

Included Work:

1. Provide any field engineering and layout required.
2. Perform all Architectural and Structural demolition in the existing building as directed by Construction Coordinator. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
3. Remove hollow metal and aluminum doors, ceramic floor, CMU, brick, stone wall, countertops, cabinets, walls, toilet partitions, shelving, carpet, VCT, etc. (Demolition of site, mechanical and electrical is by the other contractors respectively).
4. Furnish and install all new casework and countertops.
5. Furnish and install all infills at corridor walls areas for new acoustical ceilings.
6. Furnish and install new ceiling grid and tile.
7. Furnish and install metal stud/gypboard assemblies.
8. Masonry work and clear liquid water repellant on the Upper Cafeteria Walls.
9. Coordinate with the Roofing contractor regarding the thru-wall flashing installation at the upper cafeteria wall.
10. Provide all concrete and masonry cutting, demolition, and infills for mechanical and electrical contractors as directed by Construction Coodinator.
11. Furnish and install all touch-up painting required and as directed by Construction Coordinator as to where work was performed.
12. Furnished and install all required caulking at new unit ventilators as directed by Construction Coordinator.
13. Furnish and install solid surface filler panels at new Electrical panel locations and wall heater units as noted on mechanical and electrical drawings.
14. Furnish and install all wood blocking, nailers, framing, furring and sheathing for windows, doors, frames, etc.
15. Furnish and install all new hollow metal doors and frames, metal toilet compartments, toilet and bath accessories.
16. Contractor to coordinate and provide cutouts for mechanical and electrical equipment and fixtures not being supplied by this contractor.
17. Provide continuous housekeeping and cleanup.
18. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. All site demolition outside of the exterior walls & foundations.
2. Door hardware.
3. Aluminum entrance doors and aluminum windows installation.
4. Aluminum window demolition (by Owner via an asbestos abatement contractor).
5. Gym sports floor demolition (by flooring contractor).
6. New ceramic floor and wall tile and new resilient flooring (by flooring contractor).

Applicable Alternates:

100-1: Cafeteria Cavity Wall Flashing
100-2: Cafeteria Wall Masonry Tuckpointing & Clear Liquid Water Repellant

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 100-4: Paving/Site Work

Includes Specification Sections:
Section 02510 – Lincoln Elementary Parking Lots & Drives
Section 03300 - Concrete
Section 04270 – Unit Masonry
Section 04300 – Exterior Masonry Restoration
Section 05500 – Metal Fabrications
Section 09900 - Paintings

Drawings showing work for this bid category include:
100-C1.0
100-C1.1
CS
C1
C5
C6

Included Work:

1. Provide all excavation, backfill and compaction for the entire project.
2. All topsoil will be striped, stockpiled and redistributed on site. No topsoil will be removed from the site, without the authorization of the Construction Coordinator.
3. Furnish all soils needed for the backfill of the site.
4. Perform all site demolition outside of the existing building's exterior walls and foundations, including concrete, asphalt, etc.
5. Temporary remove existing bike rack and reinstall, relocate existing barrier free parking signage where shown.
6. Furnish and install silt fence and all soil erosion controls.
7. Furnish and install all curb stops as shown.
8. Furnish and install all drain lines, pea gravel etc.
9. Furnish and install all topsoil needed for the project.
10. Provide all base and sub-base for site work, including all walks, drives, lots, curbs and gutters.
11. Fine grading of base prior to asphalt is by this contractor.
12. Coordinate compaction tests of base, sub-base with the Construction Coordinator, which testing costs will be paid by the Owner.
13. Obtain the services of a licensed surveyor to establish grades as required.
14. Perform all site demolition outside of the existing building's exterior walls and foundations, including concrete, asphalt, etc.
15. Final grading and preparation of topsoil for seeding.
16. Contractor will seed site all disturbed yard areas.
17. Furnish and install aluminum guardrail at retaining wall.
18. Furnish and install new barrier free parking signage.
19. Furnish and install pipe bollards.
20. Furnish and install precast cap on retaining wall.
21. Apply all pavement markings (parking spaces, traffic flow, etc.)
22. Provide continuous housekeeping and cleanup.`
23. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. All light pole bases, excavation, backfill and compaction will be by the electrical contractor.

Applicable Alternates:

100-5: Retaining Wall Precast Cap

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Category 100-5: Flooring

Includes Specification Sections:
Section 09300 – Ceramic Floor and Wall Tile
Section 09650 – Resilient Flooring

Drawings showing work for this bid category include:
100-A1.1
100-A2.1
100-A2.2
100-A2.3
100-A6.2

Included Work:

1. Furnish and install ceramic floor and wall tile.
2. Furnish and install resilient flooring.
3. Furnish and install ceramic floor and wall tile.
4. Furnish and install gym sports floor, including the removal of the existing gym sports floor (including temporary removal of bleachers, wall mats, etc.)
5. Provide continuous housekeeping and cleanup.
6. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Removal of all existing flooring materials shall be by general trades, except that removal of existing gym sports floor is included in this section.

Applicable Alternates:

100-9: Gym Sports Floor Replacement

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 100-6: Roofing

Includes Specification Sections:
Section 07530 – EPDM Single Ply Roofing
Section 07540 - Durolast Single Ply Roofing

Drawings showing work for this bid category include:
100-A1.2

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install roofing required including insulation, membrane, wood blocking, metal flashings and metal trims required.
3. Coordinate with the General Trades contractor regarding the thru-wall flashing installation at the upper cafeteria wall.
4. Refer to Mechanical and Electrical drawings for roof penetrations and flashings.
5. This Contractor to furnish all openings through roofing material for installation of mechanical and electrical work.
6. Furnish and install all control / expansion joints as shown and or recommended by industrial standards.
7. Provide continuous housekeeping and cleanup.
8. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Patching at replacement panels will be by the general trades contractor.
2. Gypboard/metal stud construction will be by the general trades contractor.

Applicable Alternates:

100-8: EPDM Roof

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 100-7: Door Hardware

Includes Specification Sections:
Section 08700 – Door Hardware

Drawings showing work for this bid category include:
100-A1.1
100-A2.1
100-A2.2
100-A2.3
100-A6.1
100-E3.1

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install all door hardware.
3. Coordinate with the Security/Technology Contractor for doors with FOB's.
4. Furnish and pay for all fees and permits required on this project.
5. Provide continuous housekeeping and cleanup.
6. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Hardware for aluminum entrance doors

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 100-8: Aluminum Doors and Windows

Includes Specification Sections:
Section 08200 – Aluminum Entrance Doors
Section 08500 – Aluminum Windows
Section 08700 – Door Hardware

Drawings showing work for this bid category include:
100-A1.1
100-A2.1
100-A2.2
100-A6.1

Included Work:

1. Furnish and install aluminum doors and windows including any required accessories.
2. Furnish and install door hardware in aluminum entrance doors.
3. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
4. Replace existing window counterweights where noted on the drawings.
5. Provide continuous housekeeping and cleanup.
6. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Removal of existing aluminum windows is by Owner (via asbestos abatement contractor)
2. Removal of existing aluminum doors is by the general trades contractor.

Applicable Alternates:

100-6: Cafeteria Clerestory Window Replacement
100-7: 1968 Addition Window Replacement

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

BID DIVISION DESCRIPTIONS – PROJECT #2 – High School/Middle School

Bid Category 200-2: Electrical

Includes Specification Sections:
Section 16010 - General Electrical Requirements
Section 16210 - Circuit Breakers and Switches
Section 16300 - Raceway Systems
Section 16470 - Panel boards
Section 16500 - Lighting
Section 16600 - Wiring Methods
Section 16720 – Fire Alarm System
Section 16950 - Occupancy Sensors

Drawings showing work for this bid category include:
200-C1.1
200-C1.3
200-E1.1
200-E1.2
200-E1.3
200-E1.4
200-E1.5
200-E1.6
200-E2.1
200-E2.2
200-E3.3
200-E3.4

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Install new lighting (interior and exterior).
3. Install new occupancy sensors.
4. Install new power needs.
5. Connect new rolling counter fire doors at the High School/Middle School to the existing fire alarm system.
6. Furnish and install all electrical raceways required.
7. Furnish and install all power and final hook-ups to other equipment supplied by others
8. Provide power hookup to all equipment and items shown on the Architectural, Mechanical and Electrical plans or listed in the Specifications.
9. Any saw cutting of floor slabs for architectural, structural, mechanical and electrical work and removals and replacement of concrete will be by the General Trades Contractor. Electrical trade will coordinate locations with General Trades Contractor.
10. Convert existing master clock back boxes to a duplex plug-in where indicated on the drawings.
11. Hook up chain link electric operated gates.
12. Furnish and install all fireproofing sealants where this contractor's work penetrates fire rated walls and ceilings.
13. Furnish and pay for all fees and permits required on this project.
14. Perform all tests associated with the start-up of this system.
15. Furnish and install all light poles and bases including the excavation, backfill, compaction, concrete, and grouting of anchor bolts.
16. Coordinate work with Owner's technology contractor.
17. Provide Owner orientation on equipment and systems.
18. Furnish operating and maintenance manuals.
19. Provide continuous housekeeping and cleanup.
20. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Patching at replacement panels will be by the general trades contractor.
2. Gypboard/metal stud construction will be by the general trades contractor.
3. Chain link electric gate operators will be furnished and installed by the paving/site contractor.

Applicable Alternates:

200-4 – Annex Building Additional Master Clocks
200-9: New Bus Parking - Gravel
200-10: New Bus Parking – Paved
200-11: Bus Carport
200-16: Replace 1600 Amp Main Circuit Breaker

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

2012 RENOVATIONS – HUDSON AREA SCHOOLS

Bid Category 200-3: General Trades

Includes Specification Sections:
Section 04270 – Unit Masonry
Section 05500 – Metal Fabrications
Section 07240 – Exterior Insulated Finish System (EIFS)
Section 07410 – Standing Seam Sheet Metal Roofing
Section 07900 – Joint Sealers
Section 08100 – Hollow Metal Doors & Frames
Section 09110 – Metal stud Framing
Section 09260 – Gypsum Board Systems
Section 09500 – Suspended Acoustical Ceilings
Section 09810 – Interior Finish System for Shower Rooms
Section 09900 – Painting
Section 10180 – Phenolic Toilet Compartments
Section 10800 – Toilet and Bath Accessories
Section 12300 – Laminate Clad Casework, Countertop & Solid Surface Trim
Section 12380 – Display Casework

Drawings showing work for this bid category include:
200-C1.2
200-C2.2
200-A1.1
200-A2.1
200-A2.2
200-A2.3
200-A2.4
200-A2.5
200-A2.6
200-A2.7
200-A2.8
200-A3.1
200-A5.1
200-A5.2
200-A5.3
200-A6.2

Included Work:

1. Provide any field engineering and layout required.
2. Perform all Architectural and Structural demolition in the existing building as directed by Construction Coordinator. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
3. Remove hollow metal and aluminum doors, ceramic floor, CMU, brick, stone wall, countertops, cabinets, walls, toilet partitions, shelving, carpet, VCT, etc. (Demolition of site, mechanical and electrical is by the other contractors respectively).
4. Furnish and install all new casework and countertops.
5. Furnish and install all infills at corridor walls areas for new acoustical ceilings.
6. Furnish and install new ceiling grid and tile.
7. Furnish and install metal stud/gypboard assemblies.
8. Furnish and install new display cases.
9. Provide all concrete and masonry cutting, demolition, and infills for mechanical and electrical contractors as directed by Construction Coodinator.
10. Furnish and install all touch-up painting required and as directed by Construction Coordinator as to where work was performed.
11. Furnish and install solid surface filler panels at new Electrical panel locations and wall heater units as noted on mechanical and electrical drawings.

12. Furnish and install all wood blocking, nailers, framing, furring and sheathing for windows, doors, frames, etc.
13. Furnish and install all new hollow metal doors and frames, phenolic toilet compartments, toilet and bath accessories.
14. Furnish and install a wall insulation, including spray foam, masonry wall cavity, sound batt, and rigid insulation for EIFS systems.
15. Furnish and install spray roof insulation in the large courtyard additions.
16. Furnish and install new metal standing seam roofing over new areas in the large courtyard.
17. Furnish and install new carport structure (for bus parking), including foundations and superstructure.
18. Contractor to coordinate and provide cutouts for mechanical and electrical equipment and fixtures not being supplied by this contractor.
19. Provide continuous housekeeping and cleanup.
20. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. All site demolition outside of the exterior walls & foundations.
2. Door hardware.
3. Aluminum entrance doors and aluminum windows installation.
4. Flooring
5. Courtyard window demolition (by Owner via an asbestos abatement contractor).

Applicable Alternates:

200-7: Replace Stalls at HS Gym Lobby Bathrooms
200-11: Bus Carport
200-13: Boiler Room Interior Finishes

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 200-4: Paving/Site Work

Includes Specification Sections:
Section 02520 – High School/Middle School Parking Lots & Drives
Section 03300 – Concrete
Section 05500 – Metal Fabrications

Drawings showing work for this bid category include:
200-C1.0
200-C1.2
200-C1.3
200-C2.2
200-A2.3
200-A2.4

Included Work:

1. Provide all excavation, backfill and compaction for the entire project.
2. All topsoil will be striped, stockpiled and redistributed on site. No topsoil will be removed from the site, without the authorization of the Construction Coordinator.
3. Furnish all soils needed for the backfill of the site.
4. Perform all site demolition outside of the existing building's exterior walls and foundations, including concrete, asphalt, etc.
5. Protect existing utilities (see drawing 200-C1.3 for fiber and electrical line locations).
6. Perform site demolition in the courtyards.
7. Furnish and install silt fence and all soil erosion controls.
8. Furnish and install all curb stops as shown.
9. Furnish and install all drain lines, pea gravel etc.
10. Furnish and install all topsoil needed for the project.
11. Provide all base and sub-base for site work, including all walks, drives, lots, curbs and gutters.
12. Fine grading of base prior to asphalt is by this contractor.
13. Coordinate compaction tests of base, sub-base with the Construction Coordinator, which testing costs will be paid by the Owner.
14. Obtain the services of a licensed surveyor to establish grades as required.
15. Perform all site demolition outside of the existing building's exterior walls and foundations, including concrete, asphalt, etc.
16. Final grading and preparation of topsoil for seeding.
17. Contractor will seed site all disturbed yard areas.
18. Apply all pavement markings (parking spaces, traffic flow, etc.)
19. Furnish and install chain link fencing, including gates and gate electric operator (include 15 remote control devices).
20. Furnish and install aluminum guardrail at north stairs.
21. Provide continuous housekeeping and cleanup.`
22. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Track paving and resurfacing is being bid as bid category 200-10.
2. Carport foundations and superstructure is by general trades.
3. Bus parking chain link gate motor hookups by electrical contractor.

Applicable Alternates:

200-3: Replace Board Office Driveway & Parking Lot
200-9: New Bus Parking – Gravel
200-10: New Bus Parking – Paved
200-12: Exit Driveway

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Category 200-5: Flooring

Includes Specification Sections:
Section 09300 – Ceramic Floor and Wall Tile
Section 09650 – Resilient Flooring
Section 09680 - Carpet

Drawings showing work for this bid category include:
200-A1.1
200-A2.1
200-A2.2
200-A2.3
200-A2.4
200-A2.5
200-A2.6
200-A2.7
200-A2.8
200-A3.1
200-A5.1
200-A5.2
200-A5.3
200-A6.2

Included Work:
1. Furnish and install ceramic floor and wall tile.
2. Furnish and install resilient flooring.
3. Furnish and install carpet in new vestibule.
4. Provide continuous housekeeping and cleanup.
5. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:
1. Boiler room flooring is by general trades contractor.

Applicable Alternates:
200-14: New Shower Room Tile Flooring

Consideration for Award:
Successful bidders must:
1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 200-6: Roofing

Includes Specification Sections:
Section 07530 – EPDM Single Ply Roofing
Section 07540 - Durolast Single Ply Roofing

Drawings showing work for this bid category include:
200-A1.2

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install roofing required including insulation, membrane, shingles, wood blocking, metal flashings and metal trims required.
3. Perform repairs to fascia, soffit, and downspouts as indicated on the drawing.
4. Refer to Mechanical and Electrical drawings for roof penetrations and flashings.
5. This Contractor to furnish all openings through roofing material for installation of mechanical and electrical work.
6. Furnish and install all control / expansion joints as shown and or recommended by industrial standards.
7. Provide continuous housekeeping and cleanup.
8. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Patching at replacement panels will be by the general trades contractor.
2. Gypboard/metal stud construction will be by the general trades contractor.
3. Standing seam metal roofing on the courthyard area will be by the general trades contractor.

Applicable Alternates:

200-5: EPDM Roof
200-6: Shingle Roof Replacement

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 200-7: Door Hardware

Includes Specification Sections:
Section 08700 – Door Hardware

Drawings showing work for this bid category include:
200-A1.1
200-A1.3
200-A2.1
200-A2.2
200-A2.3
200-A2.4
200-A2.5
200-A2.6
200-A2.7
200-A6.1
200-E3.1
200-E3.2

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install all door hardware.
3. Coordinate with the Security/Technology Contractor for doors with FOB's.
4. Furnish and pay for all fees and permits required on this project.
5. Provide continuous housekeeping and cleanup.
6. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Hardware for aluminum entrance doors

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 200-8: Aluminum Doors and Windows

Includes Specification Sections:
Section 08200 – Aluminum Entrance Doors
Section 08440 – Aluminum Interior Storefront
Section 08450 – Aluminum Exterior Storefront
Section 08510 – Aluminum Windows with Storefront Framing
Section 08520 – Storefront Storm Windows with Integral Blinds
Section 08700 – Door Hardware

Drawings showing work for this bid category include:
100-A1.1
100-A2.1
100-A2.2
100-A6.1

Included Work:

1. Furnish and install aluminum doors and windows including any required accessories.
2. Furnish and install door hardware in aluminum entrance doors.
3. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
4. Provide continuous housekeeping and cleanup.
5. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Removal of existing courtyard windows is by Owner (via asbestos abatement contractor)
2. Removal of existing aluminum doors is by the general trades contractor.

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 200-9: Theater and Stage Equipment

Includes Specification Sections:
Section 11060 – Theater and Stage Equipment

Drawings showing work for this bid category include:
200-A1.1
200-A2.2

Included Work:

1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install all stage equipment.
3. Provide continuous housekeeping and cleanup.
4. To strictly follow all local, state and federal safety laws and procedures.

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

2012 RENOVATIONS – HUDSON AREA SCHOOLS

Bid Division Descriptions

Bid Category 200-10: Track

Includes Specification Sections:
Section 02530 – High School/Middle School Track
Section 02540 – Seal Coating

Drawings showing work for this bid category include:
200-C1.2
200-C2.1

Included Work:

1. Perform all demolition related to this trade in the track area. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Provide all excavation, backfill and compaction for the entire project.
3. Protect existing utilities.
4. Furnish and install silt fence and all soil erosion controls.
5. Furnish and install all drain lines, pea gravel etc.
6. Furnish and install all topsoil needed for the project.
7. Provide all base and sub-base work required.
8. Furnish and install new track surface.
9. Furnish and install new track accessories.
10. Sealcoat existing asphalt on the south side of the track.
11. Fine grading of base prior to asphalt is by this contractor.
12. Coordinate compaction tests of base, sub-base with the Construction Coordinator, which testing costs will be paid by the Owner.
13. Obtain the services of a licensed surveyor to establish grades as required.
14. Final grading and preparation of topsoil for seeding.
15. Contractor will seed site all disturbed yard areas.
16. Furnish and pay for all fees and permits required on this project.
17. Provide continuous housekeeping and cleanup.
18. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. High School/Middle School paving is being bid as bid category 200-4.

Applicable Alternates:

200-1: New Asphalt Base for Track
200-2: Granulated Rubber Surface for Track

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

BID DIVISION DESCRIPTIONS – PROJECT #3 – THOMPSON FIELD

Bid Category 300-1: Visitor's Bleacher Fall Protection Renovations (General Trades Work)

Includes Specification Sections:
Section 05500 – Metal Fabrications

Drawings showing work for this bid category include:
300-C1.4

Included Work:
1. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
2. Furnish and install items related to improving fall protection on the bleachers.
3. Furnish and pay for all fees and permits required on this project.
4. Provide continuous housekeeping and cleanup.
5. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:
1. Any work shown on drawings 300-C1.1 through 300-C1.3.
2. Painting.

Applicable Alternates:
None

Consideration for Award:
Successful bidders must:
1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

Bid Category 300-2: Visitor's Bleacher Painting

Includes Specification Sections:
Section 09900 – Painting

Drawings showing work for this bid category include:
300-C1.4

Included Work:

1. Perform all painting work indicated. Owner's Dumpster may be utilized to dispose of left-over materials.
2. Furnish and pay for all fees and permits required on this project.
3. Provide continuous housekeeping and cleanup.
4. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. Any work shown on drawings 300-C1.1 through 300-C1.3.
2. Structural modifications to the bleachers.

Applicable Alternates:

None

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond (if required by Owner) prior to execution of the contract.
8. Provide communication and follow-up as required.

2012 RENOVATIONS – HUDSON AREA SCHOOLS

Bid Category 300-3: Football Field Lighting & Electrical Renovations

Includes Specification Sections:
Section 03300 – Concrete
Section 16010 - General Electrical Requirements
Section 16210 – Circuit Breakers and Switches
Section 16470 – Panelboards
Section 16500 – Lighting
Section 16520 – Sports Field Lighting
Section 16600 – Wiring Methods

Drawings showing work for this bid category include:
300-C1.1
300-C1.2
300-C1.3

Included Work:

1. Provide all excavation, backfill and compaction for the entire project.
2. All topsoil will be striped, stockpiled and redistributed on site. No topsoil will be removed from the site, without the authorization of the Construction Coordinator.
3. Perform all demolition related to this trade. Remove items from the jobsite utilizing Owner's Dumpster for demolition.
4. Furnish and pay for all fees and permits required on this project.
5. Remove any excess soil material from site, unless directed otherwise by the Construction Coordinator.
6. Final grading and preparation of topsoil for seeding.
7. Seed all disturbed yard areas.
8. Provide new electrical service.
9. Completely furnish and install new football field lighting, including foundations, grounding, etc.
10. Coordinate with utility company.
11. Provide continuous housekeeping and cleanup.`
12. To strictly follow all local, state and federal safety laws and procedures.

Excluded Work:

1. All work shown on drawing 300-C1.4.

Applicable Alternates:

300-1: Football Field Lighting at 40 Footcandles

Consideration for Award:

Successful bidders must:

1. Be available for a post-bid, pre-contract award interview.
2. Be able to begin as soon as the project work area is accessible.
3. Have proper equipment and responsible personnel to complete the above list of work.
4. Repair any adjacent materials damaged in the execution of the above listed work.
5. Provide close cooperation with the Construction Coordinator and other bid divisions to provide input to develop a working schedule.
6. Submit an approved schedule of values prior to execution of the contract.
7. Obtain Material, Labor and Performance Bond prior to execution of the contract.
8. Provide communication and follow-up as required.

PART 1 GENERAL

1.01 BID SECURITY

A. Each Proposal shall be accompanied by Bid Security pledging that the Bidder will enter into a contract with the Owner on the terms stated in the Proposal, and will, if required, furnish bonds as described in Section 00600. Should the Bidder refuse to enter into such contract or fail to furnish such Bonds, the amount of the Bid Security shall be forfeited to the Owner as liquidated damages, not as a penalty.

B. Bid Security shall be in the amount of five percent (5%) of the Base Bid(s).

C. Bid Security for each Proposal containing Bids for multiple Bid Divisions shall be in the amount of five percent (5%) of the total Base Bids for the highest-priced combination of Bid Divisions included in the Proposal.

D. Bid Security may take the form of a **Bid Bond, a Cashier's Check, or a Money Order.** When submitting a Cashier's Check or Money Order for multiple Bid Divisions, it is recommended that a separate check or money order accompany each Bid Division. **A personal or company check does not constitute a Bid Security.**

E. Bid Security will be returned to Bidders within a reasonable period after construction contracts have been executed, returned, and approved by the Owner.

End of Section 00410

PART 1 GENERAL

1.01 OWNER/CONTRACTOR AGREEMENT

A. The Agreement between the Owner and each Contractor will be written on the Owner's standard Owner/Contractor Agreement Form. A sample of this Form appears as Section 00510.

B. The Owner/Contractor Agreement Form will be filled in by the Owner, as appropriate for each Contractor, and will be sent to each Contractor.

C. The executed Owner/Contractor Agreement, the General Conditions, and the other Contract Documents will be the entire, integrated Contract between the Owner and each Contractor.

D. Upon receipt of an Owner/Contractor Agreement, each successful Bidder shall review it for completeness and accuracy, execute it, and return it to the Owner's Representative for delivery to the Owner.

E. Each successful Bidder shall submit all required post-bid documents, including Labor and Material Payment Bond and Performance Bond (Section 00600) if requested by the Owner, Certificates of Insurance (Section 00650), Schedule of Values (Section 00670), and Subcontractor and Supplier Listing (Section 00680) as a **prerequisite** to execution of the Owner/Contractor Agreement.

F. The Owner will execute each Owner/Contractor Agreement after it has been properly executed by the Bidder, and after all required post-bid documents have been submitted.

1.02 NOTICE TO PROCEED

A. The Owner may elect to issue Notices to Proceed prior to the execution of Owner/Contractor Agreements.

B. Upon receipt of a Notice to Proceed, each Contractor shall commence Work in accord with the conditions contained in the Notice to Proceed.

C. Regardless of the provisions of any Notice to Proceed or of this Section, no Contractor shall commence Work until all required insurance is in force (Section 00700, Provision 11) and Certificates of Insurance (Section 00650) have been submitted to the Owner's Representative for delivery to the Owner.

D. Prior to commencement of Work, Contractors shall submit evidence satisfactory to the Owner that required bonds will be furnished, and shall deliver the Bonds by the date the Contractor executes the Owner/Contractor Agreement.

E. The Owner may include Notice to Proceed in Purchase Orders.

1.03 COMMENCEMENT OF WORK

A. Each Contractor shall commence Work immediately upon receipt of a Notice to Proceed under the conditions contained in the Notice to Proceed, or upon execution of an Owner/Contractor Agreement, whichever is earlier.

End of Section 00500

I. Date, Owner and Contractor

A. Date of Agreement: _____

B. The Parties to This Agreement

B1 The Owner:

B2 The Contractor:

III. The Project*:*

VI. The Project Location*:*

V. Description of the Work

VI. The Owner/Contractor Agreement

"ARTICLE A" - CONTRACT DOCUMENTS

A1 Documents

The Contract Documents include this Agreement and the following documents:

A1.1 General Conditions of the Contract for Construction;

A1.2 Additional Conditions, consisting of: _____

_____

_____;

A1.3 Drawings, dated: _____

_____

_____;

A1.4 Specifications, dated: _____

_____

_____;

A1.5 Addenda, Numbers: _____

_____

_____;

A2 Definitions

The definitions of terms used throughout the Contract Documents are those standard to the construction industry, or as used in the General Conditions of the Contract for Construction.

A3 Other Documents

If the provisions of this Agreement conflict with any provisions of other documents, the provisions of this Agreement shall control.

"ARTICLE B" - CONTRACTOR PERFORMANCE

B1 Contractor Performance

The Contractor agrees to perform all Work, as identified in Provision V of this Agreement, in accord with, as required by and as set forth in the Contract Documents.

B2 Representation

The Contractor, by executing this Agreement, represents that he fully understands the requirements of the Contract Documents with respect to scope and content, and will expeditiously complete the Work in conformance to the Contract Documents. He agrees to provide his best skills and judgment, and to cooperate with others involved in the Project, and at all times to protect the Owner's interests.

B3 Starting the Work

The Contractor shall commence the Work in such a manner and at such a time as to expeditiously interface with the Work of other contractors, and shall pursue the Work diligently to completion. The Contractor shall work in a cooperative manner with other contractors.

B3.1 The execution of this Agreement by both parties constitutes a Notice to Proceed with the Work, unless the Owner issues a separate Notice to Proceed designating a different starting time. The Contractor shall promptly provide timely performance according to the immediate progress requirements of the Project.

B3.2 The Contractor shall commence the Work prior to the execution of this Agreement if a Purchase Order containing a Notice to Proceed is issued by the Owner.

B3.3 Upon receipt of a Notice to Proceed, the Contractor shall pursue and complete the Work without voluntary interruption for any reason, as long as the Work can be performed, at a pace consistent with good industry practice regardless of pending or current claims or disputes in connection with the Contract Documents.

B3.4 The rates of wages and fringe benefits to be paid to each class of mechanics by the contractor and all of his sub contractors shall be not less than the wages and fringe benefit rates prevailing in the locality in which the work is to be performed. The Contractor awarded the project will be required to submit a sworn statement stating specifically that the Contractor and all of the sub contractor's on the project are complying with the Prevailing Wage Act. Additionally, weekly certified payroll records will be furnished upon owner's request.

B4 Timely Performance

B4.1 It is the Owner's intent to complete the Project as soon as possible, and in this pursuit the Owner's Representative will administer the scheduling function. The Contractor agrees to cooperate in scheduling and performing the Work to achieve completion of the Project as soon as possible.

B4.2 The Contractor acknowledges and accepts the prospects of such delays, interference's, and interruptions to the progress of the Project and to the Work as are inherent in the construction industry. The Contractor represents that he has included compensation for such delays, interference's and interruptions in the Contract Sum.

B4.3 The Owner does not guarantee that delays, interference's and/or interruptions to the work will not occur. The Owner expressly disclaims any responsibilities or obligations resulting from delays, interference's and interruptions.

B4.4 The Contractor shall not be entitled to additional compensation or damages due to delays, interference's, or interruptions to the Work or the Project, but shall be entitled only to an appropriate extension of time in accord with the General Conditions of the Contract for Construction.

"ARTICLE C" - OWNER'S PERFORMANCE

C1 Payment for Work

The Owner shall pay the Contractor for the performance of the Work, subject to the provisions of the Contract Documents, and subject to additions and deductions by Change Order, as provided in the General Conditions of the Contract for Construction. In current funds, the Contract Sum of:

($, .00)

C2 Unit Prices

In addition to the Contract Sum, or as a part thereof if it is so stipulated in this Agreement, the Owner shall pay the Contractor an amount computed from the quantity of Work performed as determined by the Project Team. The unit prices for such work shall be:

TYPE OF WORK	UNIT PRICE	QUANTITY CONTEMPLATED
(in place)	(SEE PROPOSAL FORM - Section 00305)	

C2.2 If actual quantities differ from the quantities contemplated by more than 25%, and it is shown that a substantial inequity will result either to the Contractor or to the Owner if these unit prices are used, the applicable unit prices shall be mutually adjusted.

C3 Progress Payments

The Owner shall pay the Contractor periodically for Work performed according to the provisions of the General Conditions of the Contract for Construction.

C4 Final Payment

Final Payment, constituting the entire unpaid balance of the adjusted Contract Sum, shall be paid by the Owner to the Contractor within thirty (30) days of receipt by the Owner of certification of Final Completion as stipulated in the General Conditions of the Contract for Construction.

C5 Contract Administration

The Owner shall administer the provisions of the Contract Documents through the Project Team.

C6 Construction Support Items

The Owner shall provide certain Construction Support Items to be used by all contractors in a cooperative manner. The list of these items appears in the General Conditions of the Contract for Construction.

"ARTICLE D" - CHANGES

D Pricing

D1 Modifications to Construction Documents
Modifications to the Construction Documents shall be by Bulletin prepared and issued by the Engineer, or by an approved Proposal Request prepared and issued by the Engineer. The Contractor shall promptly proceed in accord with issued Bulletin.

D2 Pricing
If a Modification to the Construction Documents shall increase or decrease a Contractor's costs for performing his Work, an adjustment in the Contract Sum shall be made. All such adjustments shall be incorporated by written change order signed by the Owner and the Engineer.

"ARTICLE E" - RISK MANAGEMENT

El Bonds

The Contractor shall provide a Performance Bond and a Labor and Material Bond, each in the value of 100% of the Contract Sum. The Contractor represents that the cost of the bonds has been included in the Contract Sum.

E2 Unanticipated Conditions

This Contract shall be equitably adjusted by Change Order to the extent that such conditions increase or decrease the cost of Work, if, during the performance of the Work, the Contractor encounters:

E2.1 Concealed conditions below the surface of the ground which are at variance with conditions indicated by the Contract Documents and with available soil investigation data, or;

E2.2 Previously unknown conditions of an unusual nature below the surface of the ground, which differ materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract.

E2.3 A substantiated written claim for such an adjustment shall be made by the Contractor or the Owner within fifteen days after first observance of any such condition.

"ARTICLE F" - OTHER PROVISIONS

** Add any other Provisions which must be included in the Owner/Contractor Agreement.

VII. Execution

The Owner and the Contractor have executed this agreement as of the day and the year stated in provision A.I.A. above.

OWNER: _____

Name (Print): _____

Signature: _____

Title: _____

CONTRACTOR: _____

Name (Print): _____

Signature: _____

Title: _____

End of Section 00510

PART 1 GENERAL

1.01 BID BONDS

A. Bid Security may be in the form of a Bid Bond.

B. When a Bid Bond is submitted, the Owner shall be listed as Oblige.

C. When a Bid Bond is submitted, the attorney-in-fact who executes the bond on behalf of the Surety shall attach to the Bond a certified, current copy of his Power of Attorney.

1.02 LABOR AND MATERIAL PAYMENT BONDS, PERFORMANCE BONDS

A. The Owner reserves the right to require any successful Bidder to furnish both a Labor and Material Payment Bond, and a Performance Bond, each in the amount of one hundred percent (100%) of his contract amount.

B. When required, Labor and Material Payment Bonds and Performance Bonds must be separate. The combined form will not be accepted.

C. When submitted, Labor and Material Payment Bonds and Performance Bonds shall include:
1. Full name and address of Contractor Surety and Owner
2. The proper Contract Date
3. The exact amount of the contract
4. The Engineer's name and address
5. Signature
6. Corporate Seal, if applicable
7. Notarization
8. Power of Attorney

1.03 SUPPLY BONDS

A. The Owner reserves the right to require any direct supplier to furnish a Supply Bond in the amount of one hundred percent (100%) of his contract amount.

B. Supply Bonds shall include all information required above (1.02.C) for Labor and Material Payment Bonds and Performance Bonds.

1.04 BOND COSTS IN BIDS

A. Do not include costs for Labor and Material Payment Bonds, Performance Bonds, or Supply Bonds in Base Bids. State the cost of such Bonds separately in the spaces provided on the Proposal Pricing Form (Section 00305). However for alternates, include any additional bond cost with the single lump sum bid for the alternate.

1.05 SUBMISSION OF BONDS

A. Bonds shall be submitted to the Engineer for delivery to the Owner within fifteen (15) days following the date of issue of a Letter of Intent (Section 00500).

B. Bonds must be submitted prior to contract execution.

C. If the Work is commenced prior to contract execution in response to a Notice to Proceed (Section 00500), the Contractor shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that required bonds will be furnished, and shall deliver the Bonds by the date the Bidder executes the Owner/Contractor Agreement (Section 00510).

End of Section 00600

PART 1 GENERAL

1.01 INSURANCE CERTIFICATES

A. Each Contractor shall provide, prior to beginning of work, a certificate of insurance for delivery to the owner indicating that all required insurance coverage is in force, Refer to the "Risk Management" Section of the General Conditions 700, (Provision 11) for information regarding required coverage.

B. Use a standard Insurance Certificate Form. The Accord form 25 (8/84) or 25-S (3/88) are preferable forms. These forms should be obtained from your insurance agent.

C. Issue all certificates to **Hudson Area Schools.**

D. Certificates must show as "additional insured" the Owner, **Hudson Area Schools** and the Engineer, **Dailey Engineering, Inc.**

E. A "Letter of Compliance" must be completed and submitted along with the certificates of insurance.

INSURANCE CERTIFICATES-

Insurance certificates must be completed as follows: (please refer to corresponding numerals on sample certificates)

1. This blank is to be dated the day the certificate of insurance is issued.

2. This blank is to provide the complete name and address of the insurance agency issuing the certificate.

3. This blank is to provide the full name and mailing address of the "prime contractor".

4. These blanks are to provide the name (or names) of the insurance company(ies) that is (are) providing the coverage for the specific coverage issued on the certificate.

5. A. General Liability - all blanks must be checked in this section and policies must be on an "occurrence" basis.

   B. Policy Number - a policy number must be listed here.

   C. Policy Effective and Expiration dates must be listed in these two blanks.

   D. This section must be filled in with dollar amounts (listed in thousands). Please refer to the examples on the following page.

Accord Form (8/84)

LIABILITY LIMITS IN THOUSANDS

TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFEC DATE (MM/DD/YY)	POLICY EXPIR DATE (MM/DD/YY)		EACH OCCURR	AGGREGATE
GENERAL LIABILITY ☒COMPREHENSIVE FORM ☒PREMISES/OPERATIONS ☒UNDERGROUND EXPLOSION & COLLAPSE HAZARD ☒PROD./COMPLETED OPER. ☒CONTRACTUAL ☒INDEPENDENT CONTR. ☒BROAD FORM PROP. DAM. ☒PERSONAL INJURY	1234567	1-1-94	12-31-94	BODILY INJURY	$1,000	$2,000
				PROPERTY DAMAGE	$1,000	$2,000
				BI & PD COMBINED	$	$
				PERSONAL INJURY		$1,000

OR

LIABILITY LIMITS IN THOUSANDS			
	EACH OCCURR	AGGREGATE	
BODILY INJURY		$	$
PROPERTY DAMAGE		$	$
BI & PD COMBINED	$2,000	$2,000	
PERSONAL INJURY		$2,000	

IMPORTANT NOTE: If any of the dollar amounts in any of the blanks on this page are less than $1,000,000 please refer to section 7, Excess Liability

6. A. These blanks must be filled in with either: See *Attachment "A*"
   Option I Any Auto, Hired, and Non-owned automobiles OR
   Option II All Owned Autos (Priv. Pass), All Owned Autos (other than Priv. Pass.), Hired Autos and Non-Owned Autos.

   B. Policy Number - a policy number must be listed here.

   C. Policy Effective and Expiration dates must be listed in these two blanks.

   D. This section must be filled in with dollar amounts (in thousands). Please refer to the two examples *Attachment "A".*

IMPORTANT NOTE: If any of the dollar amounts in any of the blanks are less than $1,000,000 please refer to section 7, Excess Liability.

7. Excess Liability (Provide $2 million Excess Liability Umbrella policy)-

   A. This blank must be checked with the "Umbrella Form".

   B. Policy Number - a policy number must be listed here.

   C. Policy Effective and Expiration dates must be listed in these blanks.

   D. If this section is required (see 7. above), both of these blanks must be filled in with a minimum of 1,000 and 1,000.

8. Workers Compensation -

   A. Nothing needs to be checked here.

   B. Policy Number - a policy number must be listed here.

   C. Policy Effective and Expiration dates must be listed in these blanks.

   D. These blanks must be filled in with minimum limits as follows:

500,000	(each accident)
500,000	(disease policy limit)
500,000	(disease each employee)

9. This section need not be completed unless some unique coverage is required for a certain type of job.

10. This section should contain the listing of the additional insureds as required in 1.01 D. The names of the Owner, and Engineer must be listed here.

11. The Owner should be listed here as this is the actual Certificate Holder. Please check the specifications for correct name and mailing address.

12. This blank must show the number 30, indicating that the Owner and all additional insureds will receive at least 30 days notice of cancellation of any of the policies listed on the certificate.

13. The certificate must be signed by a licensed insurance agent or a representative of the insurance company in order to be valid.

Letter of Compliance ~

Owner: _____

_____

Re: _____

_____

Subject: _____

_____

Gentlemen:

This letter is to acknowledge that I/We am/are the Insurance Agents for the above named contractor, and furthermore, that we have reviewed the insurance coverage required under this contract with the _____.

We hereby certify that said contractor is in compliance with all insurance coverage required under this contract with the _____.

We hereby certify that said contractor is in compliance with all insurance requirements, whether or not so evidenced on the attached certificates of insurance.

Signed:

Agency: _____

Address: _____

_____

Agent: _____

Witness: _____

Date: _____

Notary: _____

My Commission Expires: _____

For:

Contractor: _____

Address: _____

_____

Bid Division: _____

End of Section 00650

PART 1 GENERAL

1.01 DESCRIPTION

A. Within fifteen (15) days following the date of issue of a Notice to Proceed (Section 00500), each Contractor shall submit to the Engineer for delivery to the Owner, a Schedule of Values showing accurate costs for the elements of his work.

B. The Schedule of Values shall divide the work into a sufficient number of individual cost elements, labor and material, to serve as an accurate basis for Contractor's Application for Payment. Each work element shall receive its prorated share of profit and overhead.

C. Schedule of Values shall be submitted prior to the contract execution and receipt of payment.

1.02 SPECIAL ITEMS

A. In addition to regular Work elements, Contractors shall include the following items in the Schedule of Values:

1. Labor and Material Payments Bonds, if required by the Owner.
2. Performance Bonds, if required by the Owner.
3. "Housekeeping and Final Clean-up", at a cost of 1 percent (1%) of the total contract amount, or as requested by the Owner.
4. "Punch List/Retainage", at a cost of 10 percent (10%) of the total contract amount, or as requested by the Owner.

B. Schedule of Values shall be typed or printed on Contractors, letterhead paper.

C. Each Schedule of Values shall be dated and signed.

End of Section 00670

PART 1 GENERAL

1.01 DESCRIPTION

A. Within fifteen (15) days following the date of issue of a Letter of Intent, each Contractor shall submit to the Engineer for delivery to the Owner, a list of all subcontractors whom he intends to utilize in his performance of the Work, and all suppliers who will be providing materials and/or equipment to be incorporated into the Work.

B. All subcontractors' names, addresses, telephone numbers, and types of Work shall be included in the list.

C. All suppliers' names, addresses, telephone numbers, and items provided shall be included on the list.

D. All items of material and equipment included in the work shall be listed. Each item shall be listed with its manufacturer, supplier, and installing subcontractor, if applicable.

E. Subcontractor/Supplier/Material/Equipment listings shall be submitted prior to contract execution.

F. Prior to the award of a contract, the Engineer will notify the contractor if the Owner has reasonable and substantial objection to any person, organization, material and/or equipment listed by the Contractor. If the Owner has a reasonable and substantial objection, the Contractor shall amend his Proposal by providing an acceptable substitute. The Owner may, at his discretion, accept such a substitute or he may disqualify the Proposal.

G. Suppliers, subcontractors, material and equipment proposed by the Contractor and accepted by the Owner shall be used in the Work for which they are proposed and accepted, and **shall not be changed except with prior written approval of the Owner.**

End of Section 00680

PART 1 GENERAL

1.01 DESCRIPTION

A. Within fifteen (15) days following the date of issue of a Letter of Intent, each Contractor shall submit to the Engineer, for delivery to the Owner, a list of all supervisory employees whom the Contractor proposes to employ to accomplish his Work.

B. This list shall include supervisory employees' names, titles, and duties.

C. Employee listings shall be submitted prior to contract execution.

1.02 OWNER'S APPROVAL

A. Contractors are required to establish, to the satisfaction of the Owner, the reliability and responsibility of proposed employees.

B. Prior to the award of a contract, the Engineer will notify the Contractor if the Owner has reasonable and substantial objection to any person listed by the Contractor. If the Owner has reasonable and substantial objection, the Contractor may amend his Proposal by providing an acceptable substitute. The Owner may, at his discretion, accept such a substitute, or he may disqualify the Proposal.

C. Employees proposed by the Contractor and accepted by the Owner shall be employed on the Work for which they are proposed and accepted, and shall not be changed except with the written approval of the Owner.

End of Section 00690

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SECTION 1
Contract Documents

1.1 Scope

The Contract Documents consist of the following Documents:

1.1.1 The Owner/Contractor Agreement

1.1.2 The General Conditions of the Contracts for Construction

1.1.3 Additional Conditions listed in the Owner/Contractor Agreement

1.1.4 The Construction Documents which include:

1.1.4.1 Drawings,

1.1.4.2 Specifications, and,

1.1.4.3 Modifications issued during construction,

1.1.5 The Performance Bond and Labor Materials Bond, if required by the Owner, and,

1.1.6 All Addenda issued prior to the execution of the Owner/Contractor Agreement.

1.2 The Contract

The Contract Documents form the Contract for Construction which is the entire and integrated Agreement between the Owner and each Contractor.

1.2.1 Prior agreements either oral or written are superseded by these Contracts.

1.2.2 The Contract is subject to addition, deletion, correction or change through written modifications issued by the Owner.

1.2.3 All Documents comprising each Contract shall be listed and identified by title and date in the applicable Owner/Contractor Agreement.

1.3 Execution

Each contract shall be signed at least in triplicate by both the Owner and the Contractor. One executed copy shall be provided to the Contractor, and at least two extended copies to the Owner.

1.4 Intent

The intent of the Contract Documents is to describe a complete scope of work referred to as the Project. The Contract Documents are complimentary. What is required by one shall be as binding as if required by all.

1.4.1 Items not graphically or narratively described shall not be required unless they are reasonably implied, or considered necessary by standard practice, to produce the intended results.

1.4.2 Words, terms phrases and abbreviations used in the Contract Documents have common meanings, consistent with their use in the construction industry.

1.4.3 Where the words "or equal," "equal to," "as selected," "approved," "approved make," or other synonymous terms are used, the decision on acceptance or suitability is vested in the Owner.

1.4.4 The captions and titles used in the Contract Documents are inserted only as a matter of convenience, and do not define, limit, extend or describe the scope of the Document, nor the meaning or intent of any of its provisions.

1.4.5 Neither the arrangement of the technical specifications into divisions, nor the sequencing of drawings by number is intended to control or influence any contractor in planning, performing, or dividing his Work.

1.5 Construction Documents

1.5.1 Unless otherwise stipulated in the Contract Documents, the Owner shall provide to each Contractor without charge all copies of the Construction Documents reasonably necessary for the execution of his Work.

1.5.2 The Owner has provided Contract Documents to the Contractors for use exclusively on this Project. Use, in whole or in part, or other projects by a Contractor or anyone else other than the Owner is forbidden.

SECTION 2
The Owner

2.1 The Owner

The Owner is: **Hudson Area Schools**

2.2 The Project Team

The Owner has established a Project Team consisting of an Engineer, Construction Manager and several other design professionals, to represent him during the construction of the Project. The Owner heads the Project Team.

2.2.1 The Engineer and Construction Coordinator is: Dailey Engineering, Inc.
8485 Stephenson Road
Onsted, MI 49265
(517) 467-9000

2.3 Facilities

The Owner shall provide certain Construction Support Items to be used by all Contractors at the Site. The items provided by the Owner are listed in Section 13 of these General Conditions.

2.4 Dimension Control

Unless otherwise provided herein, the Owner shall furnish initial dimension and location control in the form of marked base lines and bench marks from which the Contractors shall control their Work.

The Contractor shall obtain all required permits for construction (see Section 4.14). The Owner will obtain any required plan review approvals.

2.5 Joint Occupancy

The Owner shall have the right to occupy, take possession of, and use any portions of the Project regardless of their status of completion. Such actions shall not be deemed an acceptance of any Work, completed or uncompleted, unless the Owner expressly accepts such Work.

2.6 Work by Owner

The Owner reserves the right to perform work on the Project with his own forces.

SECTION 3
Pre-Construction

3.1 REQUIREMENTS & CONDITIONS OF THE WORK

By executing his Contract, each Contractor represents that:

3.1.1 He has visited the Site,

3.1.2 He has made himself familiar with the Project,

3.1.3 He understands the requirements of his Work.

3.1.4 He accepts the conditions under which his Work will be performed.

3.2 Document Review

Prior to beginning his Work each Contractor shall thoroughly review the construction Documents. Each Contractor shall:

3.2.1 Check the adequacy and consistency of the information provided,

3.2.2 Check the accuracy and consistency of the information provided,

3.2.3 Determine if the documents contain errors or omissions which may interfere with his Work,

3.2.4 Determine if the documents accurately reflect the conditions under which he will perform his work,

3.2.5 Immediately report in writing, to the Construction, all inadequacies, inconsistencies, inaccuracies, errors, omissions, etc., which he discovers.

3.3 Interfacing Work

Prior to starting his Work each Contractor shall:

3.3.1 Familiarize himself with the Work of interfacing Contractors,

3.3.2 Promptly report anticipated interfacing problems to the Engineer,

3.3.3 Physically examine and check the suitability and condition of interfacing Work.

3.3.4 If a Contractor deems any interfacing Work unsuitable or if conditions are not as specified, he shall not commence his Work, and immediately shall notify the Engineer of his findings.

3.4 Pre-Construction Meeting

It will be mandatory that all Contractors and Material Suppliers attend the Pre-Construction meeting, and shall contribute to overall planning activities.

SECTION 4
Performance of the Work

4.1 Contractor's Responsibility

Responsibility for performance of the Work rests solely with the Contractors. Each Contractor shall perform his Work accurately, on time, and at a high level of quality.

4.2 Duties

Each Contractor shall:

4.2.1 Plan, direct, supervise, coordinate and perform his Work,

4.2.2 Determine and implement all construction means, methods, techniques, sequences, and procedures,

4.2.3 Provide all necessary materials and equipment,

4.2.4 Provide all necessary labor and tools,

4.2.5 Provide all necessary Construction Support Items unless provided by the Owner, as listed in Section 13 of the General Conditions,

4.2.6 Provide whatever else is necessary to properly complete his Work,

4.2.7 Utilize qualified, skilled, dependable persons who meet with the Owner's approval at all times in every capacity.

4.2.8 Provide daily cleanup of work area, storage areas, or as directed by Construction Coordinator.

4.3 Conformance to Contract Documents

Each Contractor warrants that all workmanship, materials, and equipment incorporated in his Work will be of good quality and in conformance with the Contract Documents.

4.4 New Materials

The Contractor warrants that all materials and equipment incorporated in the Work shall be new, unless otherwise specified in the Construction Documents.

4.5 Defective Material

Each Contractor warrants that all materials and equipment incorporated in the work shall be free from faults and defects.

4.6 Quality Standard

It is the intent of the Contract Documents to establish a standard of quality which the Owner has determined to be required and necessary for the Project. It is mandatory that items of material and equipment conform to the Contract Documents and meet the quality standards established.

4.7 Judge of Performance

The Owner shall be the judge of performance by Contractors. He shall utilize the services of the Project Team in his determination of performance, in his interpretation of the Construction Documents, and in his day-to-day involvement with the Work of Contractors.

4.8 Deficient Work

4.8.1 Each Contractor shall replace, repair or otherwise correct all deficiencies in his Work during the construction of the Project, within one year after the date of substantial completion, within the time period prescribed in any special warranties and guarantees, and any longer period prescribed by law.

4.8.2 Each Contractor shall expeditiously correct all deficiencies brought to his attention in writing by the Owner. If, in the opinion of the Owner, a Contractor fails to correct deficiencies, or fails to act expeditiously to correct deficiencies, the Owner may:

4.8.2.1 Accept the deficiencies in the Work, and reduce the Contract Sum of the Contractor at fault by a unilateral Change Order issued and signed by the Owner in an amount to be determined by the Owner, or,

4.8.2.2 Have the deficiencies eliminated in any reasonable manner available to the Owner, and charge the Contractor at fault for the costs incurred, or reduce that Contractor's Contract Sum by a unilateral Change Order issued by the Owner for the Costs Incurred.

4.9 Questionable Work

If, during the course of the Project, in the opinion of the Construction Coordinator, any portion of the Project should warrant inspection or testing, regardless of whether the Work in question is completed,

incomplete, exposed or covered, then, if the Construction Coordinator so orders, Contractors shall promptly facilitate inspection and testing regardless of expense. Each Contractor shall promptly facilitate such inspection and testing as necessary and as requested by the Owner, regardless of whether or not the work in question is his own or that of another Contractor.

4.9.1 If such tests or inspections reveal deficiencies as measured by the Construction Documents, the responsible Contractor shall bear all costs incurred to correct such deficiencies, including the cost of testing and inspection, and the cost to reconstruct any Work by testing or inspection or by the correction of any deficiency.

4.9.2 If such test and inspections do not reveal deficiencies attributable to a Contractor, the Owner shall bear all costs incurred including the cost of testing and inspection, and the cost of reconstruction. Contracts shall be modified by Change Order to reimburse Contractors for their costs.

4.10 Time

Time is of the essence of each Contractor's Contract. It is the intention of the Owner to occupy the Project by the established completion date or earlier, within the shortest time possible consistent with good construction practices, but subject to the unpredictable delays and accelerations inherent in the construction industry.

4.10.1 Each contractor shall complete his Work as expeditiously as possible, honoring all commitments to timely performance made by himself and other Contractors.

4.10.2 Each Contractor shall keep the Construction Coordinator currently informed of all factors, events and situations that may affect the timely performance of his Work.

4.11 Delays and Time Extensions

If the work of a Contractor is delayed through the fault of the Owner, or any separate Contractor employed by the Owner, or by any condition by the Owner to be beyond the Contractor's control, the time for performance of the Work of that Contractor may be extended by a Change Order.

4.11.1 Each Contractor shall notify the Construction Coordinator, in writing within ten (10) days of occurrence of the delay, of any condition or situation that in the Contractor's opinion warrants an extension of Contract Time.

4.11.2 The Contractor shall not be entitled to additional compensation or damages due to delays, interferences or interruptions to the Work or the Project, but shall be entitled only to an appropriate extension of time in accord with the General Conditions of the Contract for Construction.

4.11.3 The Contractors waive any right to an extension of time unless such written notice is received by the Construction Coordinator within ten (10) working days of the start of any condition or situation that is alleged as a cause of delay.

4.12 Cost of the Work

Except for items specifically excluded by the Contract Documents, the Contractor shall pay all costs of his Work including, but not limited to, labor, materials, equipment, tools, transportation, freight, taxes, royalties, patent fees, support facilities, construction equipment, water, heat, utilities, supervision, overhead, and all other items necessary for the proper execution and completion of the Work.

4.13 Legal Compliance

Contractors shall comply fully with all laws, statutes, ordinances, rules regulations, codes and lawful orders applicable to their Work, including employment regulations, unless specifically exempted from compliance by the Contract Documents.

4.14 Permits

Unless otherwise specifically stated in the Contract Documents, Contractors shall apply for, secure and pay for all permits, licenses and fees. Each Contractor shall schedule, conduct or perform all tests, and give all notices required by governmental units for the Work of his Contract.

4.15 Site Housekeeping

Each Contractor shall be responsible for their own daily site housekeeping and clean-up of any waste that contractor generates in the execution of their Work. Each individual contractor will be responsible for placement of all debris within their own dumpster. Each contractor will be responsible for the legal disposal off the site of all demolition material which he is responsible for. No burning of debris will be allowed on site. Refer to Specification 01710 (Cleaning) for additional requirements.

SECTION 5
Subcontractors and Employees

5.1 Contractor's Responsibility

Each Contractor shall be responsible for the acts and omissions of his employees, subcontractors, agents, fabricators, suppliers, and any other person performing any of the Work of the Contractor's Contract.

5.2 Relationship with Contractor

Any person or entity with which a Contractor contracts for work or services on this Project shall be bound by all provisions of the Contractor's Contract. Any subcontracting person or entity shall be entitled to the same rights and remedies in relation to the Contractor as are provided herein for the Contractor in relation to the Owner.

5.3 Relationship with Owner

Nothing contained in the Contract Documents shall create any contractual relationship between the Owner and any party employed by or contractual to a Contractor.

SECTION 6
Separate Contractors

6.1 Other Contractors

By executing this Contract, each Contractor acknowledges that other Contractors will be performing Work on the Project prior to, during, and after his own Work.

6.2 Cooperation

6.2.1 Each Contractor shall cooperate with other Contractors and their employees, subcontractors, suppliers, fabricators, agents, and anyone else performing work on the Project regardless of race, color, creed, sex, origin, labor affiliation or absence of labor affiliation.

6.2.2 Contractors shall cooperate especially with interfacing Contractors.

6.2.3 Contractors shall considerately use the Site for storage and marshaling purposes and be responsible for their employees' and subcontractors' use of the Site and the facilities provided by the Owner.

6.2.4 Contractors shall comply with directives of the Engineer allocating among the Contractors utilization of the site and the Construction Support Items provided by the Owner.

6.3 Interfacing Work

Each Contractor shall be responsible for timely and accurate interface of his Work with the Work of others.

6.4 Commencement of Work

6.4.1 Time is of the essence of each Contract. Each Contractor shall commence his Work as soon as interfacing Work is sufficiently complete.

6.4.2 Commencement of Work upon the Work of another Contractor shall constitute acceptance of the suitability and condition of the other Work.

6.4.3 After commencement of his Work upon the Work of another Contractor, each Contractor shall be obligated to cooperate with the other Contractor in all corrections deemed necessary by the Owner in accord with the Contract Documents.

6.5 Unsuitable Work

If a Contractor finds fault with another Contractor's Work, the Contractor at fault shall correct any deficiencies immediately, so that the interfacing Contractor can proceed with his Work.

6.6 Damaged Work

6.6.1 Contractors shall immediately repair any damage they may cause to the Work of other Contractors.

6.6.2 Contractors shall immediately report to the Engineer any damage to their Work or Property, or loss of their Property.

6.6.3 Each Contractor shall be responsible for cutting and patching the Work of other Contractors when such cutting and patching is made necessary by his performance of, or correction of, his own Work.

SECTION 7
Project Interaction

7.1 Communication

All communication between the Owner and the Contractor shall be through the Construction Coordinator unless otherwise provided herein.

7.2 Contractor Administration

The Owner, through the Engineer and Construction Coordinator, will provide administration of Work on-site activities of Contractors and the Owner's forces.

7.2.1 The Owner intends to administrate the Work of each Contractor with that of other Contractors and the Owner's own forces during simultaneous performance, and to administrate the interfacing of each Contractor's Work with that of others.

7.2.2 The Owner will not plan, direct, supervise or control the Work of the Contractors or the Contractors' employees, subcontractors, agents or suppliers.

7.2.3 The Owner reserves the right to accelerate, slow down or stop the Work of any Contractor when the Owner deems such action to be in the Owner's best interest.

7.2.4 Contractors shall work with the Engineer and Construction Coordinator in a spirit of cooperation with respect to planning, scheduling and executing their Work.

7.3 Scheduling

The Engineer will provide the overall scheduling function for the Project, and will administer scheduling input from Contractors during the course of construction. Day-to-day activities planned by the Contractors will be incorporated into a Construction Schedule. The purpose of the Construction Schedule is to guide the Project from milestone to milestone, using input provided by the Contractors on a weekly basis.

7.3.1 Each Contractor shall diligently plan all aspects of his Work in sufficient detail to schedule his activities, on a day-to-day basis, for a projected period of approximately three months into the future. Each Contractor shall update his schedule at least weekly.

7.3.2 The Contractors shall attend Progress Meetings, usually held at the Site on a weekly basis, for the purpose of updating the Construction Schedule. The Contractors shall provide scheduling information to the Engineer and to other Contractors at these Progress Meetings.

7.3.3 The Construction Coordinator will provide a Milestone Schedule which will establish the major point of completion during construction, and toward which the Contractors shall orient their efforts.

7.3.4 Weekly progress meetings shall be held at the job site. Field Supervisors from each contractor working “on site” shall attend all such meetings. Short term construction activities will be addressed covering the next three weeks of work weekly.

7.3.5 Monthly progress meetings shall be held at the job site. The Construction Coordinator shall provide the services of qualified main office personnel at each such meeting. Each Contractor shall provide the services of qualified main office personnel and his field supervisor who shall provide the necessary scheduling information and manpower commitments at each progress meeting until completion of his Contract. Prior to and in preparation for the monthly progress meeting, the Construction Coordinator shall "update" the schedule to reflect the current status of the Project. During the monthly progress meeting, the Construction Coordinator will specifically address those critical areas of concern (as determined by the schedule "update") where immediate action by the Contractor(s) is required.

7.3.6 The Construction Coordinator reserves the right to assist the various Contractors in the expediting of their material and equipment deliveries without assuming the responsibility for said deliveries. The Contractor shall furnish copies of their equipment and material purchase orders complete with scheduled shipping and receiving dates to the Construction Coordinator.

7.3.7 Whenever it becomes apparent from the monthly "updated" schedule that any activity completion date may not be met, the responsible Contractors shall take some or all of the following actions at no additional cost to the Owner or Engineer.

1. Increase construction manpower in such quantities as will substantially eliminate the backlog of work and put the Project back on schedule.
2. Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing which will substantially eliminate the backlog of work and put the Project back on schedule.
3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities and put the Project back on schedule.

7.3.8 If a Contractor fails to take any of the above actions within forty-eight (48) hours after receiving written notice, the Construction Coordinator shall take action to attempt to put the Project back on schedule, and deduct the cost of such actions from the moneys due the Contractor.

7.4 Intermittent Work

7.4.1 If a Contractor's Work is intermittent by nature, or if he has reason to leave the Site for a period of two days or more, he shall inform the Construction Coordinator in advance.

7.4.2 When planning to leave the Site during the course of his Work, a Contractor shall provide evidence that his absence will not adversely affect the progress of the Project, nor of any other Contractor's previously-scheduled commitment.

7.4.3 When planning to reduce the manpower during the course of his Work, a Contractor shall provide evidence that reduced manpower will not adversely affect the progress of the Project, nor of any other Contractor's previously-scheduled commitment.

7.4.4 Contractors shall cancel any absences or manpower reductions that, in the opinion of the Construction Coordinator, will adversely affect scheduled progress as determined by the Construction Schedule and the Program Schedule.

7.5 Technical Submittals

Shop drawings, product data, cuts and samples are considered priority items in the execution of the Work.

7.5.1 Material, equipment and other items requiring submittal of data and/or supplementary information by Contractors to the Project Team will be listed as much as possible in the Construction Documents. In instances where the list is not complete, Contractors shall provide submittals as required by the Engineer.

7.5.2 The Engineer will administrate and expedite the Contractor submittal process from contractors to the Project Team, and back again.

SECTION 8
Interpretations, Instructions and Changes

8.1 Interpretations

Subject to the Concurrence of the Owner, the Engineer will be the prime interpreter of the Construction Documents, and the Engineer will be the prime interpreter of other Contract Documents.

8.2 Instructions

Instructions and clarifications may be issued to the Contractors from time to time during the performance of their Work.

8.2.1 The Construction Coordinator will provide or make available additional instructions and clarification with reasonable expedience, upon request by the Contractors.

8.2.2 Instructions and clarification will be consistent with the Contract Documents, true developments thereof, and reasonable inferable therefrom.

8.3 Changes

The Owner, without invalidating the Contract, may change the Work and Conditions for performance of the Work, and may modify the Contract Documents to accommodate changes in the Work, or in the conditions for performance of the Work. Changes may add to, delete or revise Work under the Contract.

8.3.1 Modifications to the Owner/Contractor Agreement and to the General Conditions shall be by written Owner Work Order signed by the Owner, Engineer and Construction Coordinator, except when the Owner issues a unilateral Change Order in connection with acceptance of defective Work.

8.3.2 Modifications to the Construction Documents shall be by Bulletin prepared and issued by the Engineer, or by an approved Proposal Request prepared and issued by the Engineer and Construction Coordinator. The Contractor shall promptly proceed in accord with issued Bulletin.

8.3.3 The Contractor shall promptly proceed in accord with Proposal Request upon Engineer's and Construction Coordinator approval.

8.3.4 If a Modification to the Construction Documents shall increase or decrease a Contractor's costs for performing his Work, an adjustment in the Contract Sum shall be made. All such adjustments shall be incorporated by written change order signed by the Owner and the Engineer. Unless otherwise agreed to, a lump sum method shall be utilized to determine price adjustments.

8.4 Waiver Adjustment in Contract Sum and Contract Time

8.4.1 Such written notice shall be delivered to the Owner, either, within fifteen (15) working days of receipt of such interpretation, instruction, clarification, change, Bulletin, or Modification, or before proceeding with the work affected, whichever is earlier.

8.4.2 Express written notice is a condition of any adjustment. Written notice is required in order to enable the Owner and his representatives to independently evaluate the necessity or economic impact of requested changes.

8.4.3 Actual knowledge of a Contractor's claim, or oral notice of a Contractor's claim to the Owner or his representative shall not satisfy the requirement of written notice, nor shall such knowledge or oral notice affect a Contractor's waiver of the right to any adjustment as provided hereunder.

SECTION 9
Payments

9.1 Progress Payments

The Owner, upon receipt of a certificate of payment which has been approved by the Engineer will exchange a Progress Payment for a Sworn Statement and/or Partial Waiver of Lien from each Contractor. Payment shall include compensation for work performed during the pay period, and for materials and equipment paid for by the Contractors, delivered to the site and properly stored on the site. Payments for materials and equipment paid for by the Contractors and stored off the site will be made only if agreed upon in advance, in writing by the Owner, and upon satisfactory evidence of proper storage, indemnification and insurance to protect the interest of the Owner.

9.1.1 The billing period will be from the first day of the month to the last day of the month.

9.1.2 Progress Payments are derived directly from approved Schedule of Values. No monthly billing will be allowed until the Contractor's Schedule of Values is approved.

9.1.3 Schedule of Values are required from all Contractors. Any Contractor not submitting their Schedule of Values within fifteen (15) days after issuance of the letter of intent, will be subject to the Engineer's breakdown of values.

9.1.4 Billings shall be submitted in triplicate to the **Construction Coordinator** on AIA forms at any time, but no more often than monthly. Any bill submitted in any other form shall be returned to the Contractor unpaid.

9.1.5 Contractor bills will be reviewed by the Construction Coordinator. Each monthly billing will coincide with the approved Schedule of Values previously submitted and show percentage of completion for each item being requested for payment and a composite percentage complete for the entire contract. Allow one week for review.

9.1.6 Payments shall be made on the approved percentages of all timely and properly submitted billings. Payment by the Owner shall be made after the acceptance by the Owner, and no later than thirty (30) days following the Engineer's approval.

9.1.7 A notarized sworn statement must accompany each and every billing form. All subsequent bills must be submitted with lien waivers from the Contractor's suppliers, subcontractors, and equipment providers in addition to the sworn statement. ANY BILLING WHICH IS RECEIVED THAT DOES NOT HAVE THE PROPER ACCOMPANYING DOCUMENTATION WILL BE RETURNED TO THE CONTRACTOR UNPAID AND WILL NOT BE CONSIDERED FOR PAYMENT UNTIL THE FOLLOWING BILLING PERIOD.

9.1.8 The Contractors shall warrant that title to all Work, materials and equipment covered by each Application for Payment will pass to the Owner free and clear of liens, claims, security interests or encumbrances of any kind.

9.1.9 Progress Payments made are subject to a retained amount of ten (10) percent.

9.1.10 The payments of Progress Payments by the Owner is not guaranteed, and is subject to the other provisions of the Contract.

9.2 Payments Withheld

Certificates for Payment may not be approved and Progress Payments may be withheld by the Owner for various reasons including, but not restricted to, the following:

9.2.1 Defective work not remedied,

9.2.2 Third party claims filed, including claims filed against the Contractors, the Work, the Project, the Progress Payments, the retainage or the Owner, or reasonable evidence indicating probable filing of such claims,

9.2.3 Failure by a Contractor to pay for materials, equipment, labor or subcontractor services promptly,

9.2.4 Evidence that the Work cannot be completed for the amount outstanding on a Contract,

9.2.5 Damage to the Owner or another Contractor,

9.2.6 Evidence that the Work cannot be completed on time,

9.2.7 Failure to carry out the work in accord with Contract Documents.

9.3 Release of Withheld Payments

When the reasons for withholding payments have been removed, payments withheld shall be made promptly by the Owner to the Contractor.

Completion

10.1 Substantial Completion

The date of Substantial Completion of the Contract of any Contractor shall be the date when the Work is: ready, without encumbrances or interference for the work of other Contractors, or, sufficiently complete in all respects in substantial accord with the Contract Documents and ready for use by the Owner for its intended purposes, without substantial inconvenience or discomfort.

10.1.1 When a Contractor considers his Work substantially complete, he shall submit an Application for Substantial Completion to the Engineer certifying that the Work is substantially complete, and listing any incomplete items.

10.1.2 The Engineer will prepare a Certificate of Substantial Completion. If the Engineer determines that the Work is substantially complete, the Engineer shall enter a proposed Date of Substantial Completion on the Certificate of Substantial Completion. The Engineer will forward the certificate to the Owner for approval.

10.1.3 Upon approval by the Owner, the Certificate will establish the Date of Substantial Completion.

10.1.4 All warranties and guarantees called for under the terms of the Contract shall commence on the Date of Substantial Completion unless otherwise provided in the Contract Document.

10.2 Final Completion

The date of Final Completion of each Contract shall be the date when Work is totally interfaced by all interfacing Contractors and is ascertained to be in accord with the Contract Documents.

10.21 When a Contractor considers his Work finally complete, the Contractor shall submit a final Application for Payment to the Construction Coordinator.

10.2.2 If the Engineer determines that the Work is finally complete, they shall approve the final Application for Payment.

10.2.3 The Owner shall issue a final Progress Payment in accord with Section 9.1 of these General Conditions for the remaining amount of the Contract sum, adjusted by any Change Orders, upon receipt of a final Application for Payment approved by the Engineer.

10.2.4 Sworn Statements shall cover the entire Contract Sum and Waivers of Lien shall cover all work performed by the Contractor.

10.2.5 At the option of the Owner, the Contractor shall furnish Bonds which will indemnify the Owner against any lien which may be filed after Final Payment is made.

10.2.6 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified as reserved in the final Application for Payment.

10.3 Liquidated Damages

10.3.1 The Contractor shall complete all Work on or before **8/17/2012**.

10.3.2 Liquidated damages will be charged against the Contractor in the amount of **(Not applicable)** for each calendar day after the completion date until the Contractor completes the Work.

10.3.3 A Certificate of Substantial Completion shall be issued by the Engineer upon completion of the Work by the Contractor and after the Work is inspected and accepted by the Owner, and Engineer.

10.4 Record Drawings

As a condition of final payment each contractor shall mark any and all installation information that differs in size, dimension, or type from that shown on the Construction Documents on a single set of Construction Documents which he shall submit to the Engineer.

SECTION 11
Risk Management

11.1 Safety

Each Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with his Work. The Contractors shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

11.2 Indemnification

Each Contractor shall indemnify and hold harmless the Owner and the Owner's consultants, agents and employees from and against all claims, damages, losses and expenses, including, but not limited to, attorney's fees, arising out of, or resulting from the performance of the work.

11.2.1 Each Contractor shall defend any and all suits brought against the Owner by any person, whether in the employ of the Contractor or not, for damage to property, and/or injury or death to persons alleged or claimed to have been caused by or through his performance of work.

11.2.2 In the event of any such injury, death loss, damage, claim or claim therefore, the contractors shall give immediate notice thereof to the Owner.

11.3 Contractor's Liability Insurance

Each Contractor shall purchase and maintain such insurance as will protect him from claims that may arise out of or result from his operations under the Contract, whether such operations be by himself, a subcontractor or by anyone directly or indirectly employed by the Contractor or subcontractor, or by anyone by whose acts the Contractor, a subcontractor, an employee, an agent, or the Owner, may be liable, in connection with the Contractor's Work.

Each Contractor shall carry at least the following minimum policies and amounts:

11.3.1 Workman's Compensation and Employer's Liability Insurance

11.3.1.1 Workmen's Compensation and Occupational Disease Insurance at statutory limits as required by the state in which the Work is to be performed,

11.3.1.2 Employer's Liability Insurance at a limit not less than One Hundred Thousand ($100,000) for all damages arising from each accident or occupational disease.

11.3.2 Comprehensive General Liability Insurance Covering

11.3.2.1 *Operations/Premises Liability*: Including but not limited to bodily injury, including death at any time resulting therefrom to any person, or property damage resulting from execution of the Work, or due to, or arising in any manner from any act or any omission or negligence of the Contractor and/or any subcontractor, or their respective employees or agents,

11.3.2.2 *Elevator Liability*: Including but not limited to, bodily injury, including death at any time resulting therefrom to any person, or property damage resulting from operation or use of any elevator hoist, if either or both are operated or used in connection with the execution of the Contract,

11.3.2.3 *Contractors Protective Liability*: Including, but not limited to, bodily injury, including death at any time resulting therefrom, to any person, or property damage arising from acts or omissions of any subcontractor, or a subcontractor's employees or agents,

11.3.2.4 *Products/Completed Operations Liability*: Including but not limited to, bodily injury, including death at any time resulting therefrom to any person, or property damage because of goods, products, materials or equipment used or installed under this Contract, or because of completed operations, which may become evident after completion of the Project, including damage to structures or their contents,

11.3.2.5 *Contractual Liability*: All liability insurance coverage required herein for contractors and their Subcontractors shall specifically include Contractual Liability (hold harmless) coverage to satisfy the indemnification provision 11.1 above;

11.3.2.5 *Contractual Liability*: All liability insurance coverage required herein for contractors and their Subcontractors shall specifically include Contractual Liability (hold harmless) coverage to satisfy the indemnification provision 11.1 above,

11.3.2.6 *Special Requirements*: The insurance required under Provision 11.3.2 shall specifically include the following special hazard coverage:

a. Property damage caused by conditions otherwise subject to exclusions "X, C, & U," explosion, collapse and underground damage, as defined by the National Bureau of Casualty Underwriters, if the Contractor's Work involves excavation or underground work,

b. "1973" ISO Occurrence or similar
1,000,000 Occurrence Bodily Injury
1,000,000 Aggregate
1,000,000 Occurrence Property Damage
1,000,000 Aggregate

OR

1,000,000 Occurrence/1,000,000 Aggr Combined Single Limit
Including Personal Injury
Premises & Operations
Products & Completed Operations

Contractual (Protective)
Independent Contractor

OR

b. "1986" ISO Commercial General Liability Insurance Form
1,000,000 General Aggregate
1,000,000 Products & Completed Operations Aggregate
1,000,000 Personal Injury
1,000,000 Occurrence
50,000 Fire Legal Liability
5,000 Medical Payments
Including Contractual (Protective)
Independent Contractor
Premises & Operations

11.3.3 Comprehensive Automobile Liability Insurance Covering

11.3.3.1 All owned, hired, or non-owned vehicles including loading or unloading thereof,

11.3.3.2 The insurance required under Provision 11.3.3 shall specifically include the following special hazard coverage:

a. 1,000,000/1,000,000 Bodily Injury
1,000,000 Property Damage

OR

1,000,000 Combined Single Limit

11.3.3 Umbrella Clause: If an umbrella policy is written to implement the above prime coverage, the umbrella policy shall state specifically that the policy is written on an "Occurrence" basis.

11.4 Approval of Coverage

No Contractor shall commence work until he has obtained all insurance required under Provision 11.3, and until all coverage has been approved by the Owner. The Contractors shall not permit a subcontractor to commence work until the same insurance specified for the Contractor is obtained by the subcontractors. Unless otherwise specifically stated. Contractors shall maintain all insurance specified in 11.3 for a period of not less than a year after the date of Substantial Completion.

11.5 Certificates of Insurance

Each Contractor shall file with the Owner, through the Engineer, Certificates of Insurance showing the policies carried, coverage and conditions. Certificates of Insurance shall contain the non-cancellation clause quoted in 11.7 below. Refer to specification section 00650 for specifics.

11.6 Copies of Policies

If requested by the Owner, the Contractor shall furnish true copies of each policy required of him and/or his subcontractors.

11.7 Cancellation Restrictions

Each policy shall contain the following endorsement:

"This policy will not be canceled in whole, or in part, or changed in any way, without providing written notice to the Owner at least thirty (30) days prior to cancellation or change. In the event that notice is not provided as stipulated herein, even though cancellation or change occurs, this policy shall remain in force with full effect and benefit to the Owner for thirty (30) days after notice has been provided."

11.8 Owner's Insurance

11.8.1 The Owner shall purchase Owner's Protective Liability Insurance as protection against claims which may arise during the course of the Project.

11.8.2 Property Insurance:

Builder's Risk Completed Value Insurance: The Owner shall effect and maintain Builder's Risk Insurance for completed value coverage, and shall include the interests of the Contractors and their subcontractors. Coverage shall include all structures on which work is to be done, to one hundred percent (100%) of the insurable value thereof, including items of labor and materials, connected therewith, whether in or adjacent to the structures insured, materials in place or to be used as part of the permanent construction, including surplus materials, shanties, protective fences, bridges, temporary structures, miscellaneous materials, and supplies incidental to the Work, and such scaffolding, stages, towers, and equipment as are not owned nor rented by Contractors, the cost of which is included in the cost of the Work. EXCLUSIONS: This insurance shall not cover any tools owned by mechanics, any tools, equipment, scaffolding, staging towers or forms owned or rented by Contractors, the capital value of which is not included in the cost of the Work, nor any structures erected for housing or feeding the workers.

11.8.3 Any loss is to be made adjustable with and payable to the Owner as Trustee for Insureds, Contractors and subcontractors as their interests may appear, except in such cases as may require payment of all or a portion of said insurance to be made to a Mortgagee as his interests may appear.

11.8.4 The Owner shall obtain the required insurance prior to any opportunity for exposure to risks by Contractors in the performance of their Work, and shall provide copies of policies to a Contractor at his request.

11.9 Waiver of Subrogation

11.9.1 The Owner and each Contractor waive all rights against each other, other Contractors and any subcontractors for damages caused by perils covered by Insurance provided under 11.8, except such rights as they may have to the proceeds of such insurance held by the Owner as Trustee.

11.9.2 Each Contractor shall require similar waivers from all his subcontractors.

11.10 Joint Occupancy Insurance

Prior to any joint occupancy, use or possession of Incomplete Work by the Owner, the insurance provisions of the Contract shall be reviewed by appropriate Contractor (s) and the Owner. If required, the Contract (s) shall be modified to provide joint occupancy insurance coverage.

11.11 Insurers

All insurers writing coverage for this Project shall be approved and/or licensed to operate in the state where the Work is being performed. Certification of this requirement shall be provided by each Contractor to the Owner before Work begins.

11.12 Faithful Performance and Payment

The Owner has the right to require any Contractor to furnish bonds covering the faithful performance of his Contract and the Payment of all obligations arising thereunder, in such form as the Owner may prescribe, and with such surety as he may approve.

11.12.1 If the bonds are required by the Bidding Documents, the cost of providing them rests with the Contractors.

11.12.2 If the Owner first requires any other Contractor to provide bonds after the receipt of that Contractor's Bid Proposal, the cost of providing them rests with the Owner. Such costs shall be reimbursed to the Contractor by Change Order.

11.13 Protection Against Royalties and License Fees

Each Contractor shall pay all royalties and license fees connected with his Work. Each Contractor shall defend all suits or claims for infringement of patent rights, and shall save the Owner harmless from loss on account thereof, except when the design, process or product in question is required by the Owner. In any such case, the Contractor shall be responsible for such loss only if he has reason to believe that the design, process or product so specified is an infringement of a patent, and fails to give such information promptly to the Owner.

SECTION 12
Remedies, Limitations on Remedies and Termination

12.1 Rights and Remedies

12.1.1 The duties and obligations imposed by the Contract Documents on Contractors and all rights and remedies available to the Owner thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available at law.

12.1.2 No action or non-action by the Owner or a Contractor, or any employee of agent of the Owner shall constitute a waiver of any right or duty afforded the Owner under the Contract. No such action or non-action shall constitute approval of nor acquiescence in any breach thereunder, except as may be agreed to in writing, or as otherwise specifically stipulated herein.

12.2 Remedy of Damage

Should a Contractor cause damage to the Work or property of the Owner, or to other Work on the Site, the Contractor shall promptly remedy such damage.

12.3 Remedies Regarding Separate Contractors

12.3.1 Should a Contractor or Contractors cause delay or damage to the Work or property of another Contractor, the Wronged Contractor agrees to look solely to such separate Contractor or Contractors for compensation for such delays or damages to his work or property.

12.3.2 Should a Contractor cause delay or damage to the Work or property of any other Contractor, the responsible Contractor upon claim being made or upon notice of such claim, shall promptly attempt to settle with such other Contractor by agreement or by arbitration, otherwise to resolve such dispute.

12.3.3 By entering into contracts with the Owner these General Conditions being a part of the Contracts, all Contractors agree that they shall proceed directly against one another, or others, to enforce any claim for delay or damage to the Work or property of the other not withstanding the absence of a direct contract between the parties involved. This specific provision shall be deemed a third party beneficiary provision. The Owner and Engineer shall not be parties in nor to any proceeding.

12.3.4 If, notwithstanding the provisions contained herein, any Contractor sues or requests an arbitration proceeding against the Owner, or the Engineer on account of any delay or damage to his Work or property alleged to have been caused or found to have been caused by another Contractor, then the Owner, Engineer shall notify the Contractor alleged to be at fault. The Contractor alleged to be at fault then shall promptly indemnify, defend and hold the Owner, and Engineer harmless from any proceedings and any judgment or award which might arise therefrom. In addition, the Contractor at fault promptly shall pay any costs or expenses the Owner, or Engineer have incurred therein, including all attorney's fees.

12.4 Continuation of the Work

12.4.1 Unless the Owner specifically authorizes the cessation of Work, each Contractor shall carry on his Work and maintain its progress during any arbitration or other legal proceeding or during any dispute. The Owner shall continue to make payments to the Contractors in accord with the Contract Documents, except such payments as are subject to arbitration or other legal proceeding, or are in dispute.

12.4.2 Each Contractor specifically agrees that, notwithstanding any legal remedy otherwise available to the Owner, which remedies are expressly reserved hereby to the Owner, upon application by the Owner for mandatory injunction, such legal remedies shall be presumed inadequate, and the obligations of the Contractor to carry on the Work under his Contract, notwithstanding any dispute, controversy or claim, may be enforced by a mandatory injunction.

12.5 Termination by the Owner

12.5.1 The Owner may terminate any Contractor's Contract five or more working days after giving written notice to the Contractor.

12.5.1.1 If the Contractor should file a voluntary petition, or have an involuntary petition filed against him, under any chapter of the Bankruptcy Code, as amended, which is not dismissed within thirty (30) days after said petition is filed, or,

12.5.1.2 If the Contractor makes a general assignment for the benefit of the Contractor's creditors, or,

12.5.1.3 If the Contractor becomes insolvent or a Receiver, Trustee, or Liquidator of any of the assets of the Contractor is appointed, or,

12.5.1.4 If the Contractor repeatedly refuses or fails to supply enough properly-skilled workmen or proper materials or equipment to satisfactorily prosecute and complete the Work according to schedule and within the Contract Time, or,

12.5.1.5 If the Contractor fails to perform the Work of the Contract in accord with its terms, or,

12.5.1.6 If the Contractor fails to make prompt payment to subcontractors, or for labor, materials, or equipment, or,

12.5.1.7 If the Contractor disregards laws, ordinances, codes, rules, regulations. or orders of any public authority having jurisdiction, or,

12.5.1.8 If the Contractor is otherwise guilty of a substantial violation of a provision of the Contract Documents.

12.5.2 The Owner shall seek the advice of the Engineer prior to any such termination. However, any such termination shall be at the sole option of the Owner.

12.5.3 Upon such termination the Contractor shall vacate the Site, and the Owner may take possession of the Work of the Contractor, and the Contractor's materials, equipment, tools, and machinery.

12.5.4 After such termination, the Owner may complete the Work by any means the Owner deems expedient. In such case, the Contractor or his Surety shall not be entitled to further payment until the Work is completed.

12.5.5 Such termination by the Owner shall not prejudice any other right or remedy of the Owner.

12.5.6 If the Owner completes the Work and the Unpaid balance of the Contract Sum exceeds the cost of finishing the Work, including the Owner's additional costs, damages, attorney's fees and compensation for the Engineer's additional services, such as excess shall be paid to the Contractor.

12.5.7 If the total of such costs for the Owner to complete the Work, together with all costs, expenses and damages in connection thereto, exceed such unpaid balance, the Contractor shall pay the difference to the Owner.

12.5.8 The amount to be paid to the Contractor or to the Owner under such a termination shall be certified by the Owner and verified by the Engineer, and this obligation for payment shall survive the termination of the Contract.

12.6 Contractor's Notice and Waiver

12.6.1 If a Contractor claims that the Owner has breached the Contract in any respect, or if a Contractor claims he is entitled to additional Compensation or damages or a time extension due to any reason or cause not otherwise provided for in the Contract Documents, that Contractor shall be deemed to have waived any right to remedy or relief from such breach, occurrence or condition unless the Contractor shall give prompt written notice within ten (10) working days of that Contractor's first knowledge of any such breach, occurrence or condition.

12.6.2 Neither actual knowledge by the Owner, or Engineer of the facts on which the Contractor relies as constituting a breach, nor actual knowledge by the Owner, or Engineer of the occurrence or condition on which the Contractor relies, nor any oral notice thereof, shall affect the Contractor's waiver thereunder in the absence of timely written notice.

SECTION 13
Construction Support Items

1. Electricity
2. Telephone
3. Water
4. Sanitary Facilities
5. Temporary Heat

See specification Section 01510

SECTION 14
Special Conditions

14.1 Background Checks

14.1.1 Contractors shall submit a proposed list of employees who will be present on-site, along with ID such as a Michigan Drivers License. Background checks will be performed by the Construction Coordinator. The Owner and Construction Coordinator reserve the right to exclude personnel from on-site activities who are deemed to be unsuitable.

End of Section 00700

PROJECT DRAWING LIST

A	Cover Sheet

Project #1 – Lincoln Elementary School

100 C1.0	Lincoln Elementary Site Plan
100 C1.1	Lincoln Elementary Site Details
100 C2.1	Electrical Site Plan
100 A1.1	Composite Floor Plan
100 A1.2	Roof Plan
100 A2.1	Floor Plan – Unit A
100 A2.2	Floor Plan – Unit B
100 A2.3	Enlarged Restroom Plans
100 A6.1	Door Schedule & Details
100 A6.2	Room Finish Schedule
100 E1.1	Electrical Plan – Unit A
100 E1.2	Electrical Plan – Unit B
100 E2.1	Lighting Plan – Unit A
100 E2.2	Lighting Plan – Unit B
100 E3.1	Technology/Security Floor Plan
100 E3.2	Enlarged Boiler Room Electrical Plan
100 E3.3	Electrical Schedules & Details

City Bike Path (Murdock Trail) Drawings

CS	Cover Sheet
C1	Notes & Legend/Typical Cross Sections
C5	Plan and Profile
C6	Plan and Profile

Project #2 – High School/Middle School

200 C1.1	Site Demolition Plan
200 C1.2	Site Plan
200 C1.3	Electrical Site Plan
200 C2.1	Track Plan
200 C2.2	Bus Carport Plan & Details
200 A1.1	Composite Floor Plan
200 A1.2	Roof Plan
200 A1.3	Annex Building Floor Plan
200 A2.1	Floor Plan – Unit A
200 A2.2	Floor Plan – Unit B
200 A2.3	Floor Plan – Unit C
200 A2.4	Floor Plan – Unit D
200 A2.5	Floor Plan – Unit E
200 A2.6	Floor Plan – Unit F
200 A2.7	Main Entrance Vestibule Plan
200 A2.8	Enlarged Restroom Plans
200 A3.1	Interior Elevations
200 A5.1	Courtyard Wall Details
200 A5.2	Courtyard Wall Details
200 A5.3	Interior Wall Details
200 A6.1	Door Schedule
200 A6.2	Room Finish Schedule
200 E1.1	Electrical Plan – Unit A
200 E1.2	Electrical Plan – Unit B

200 E1.3	Electrical Plan – Unit C
200 E1.4	Electrical Plan – Unit D
200 E1.5	Electrical Plan – Unit E
200 E1.6	Electrical Plan – Unit F
200 E2.1	Enlarged Boiler Room Electrical Plan
200 E2.2	Annex Building Electrical Plan
200 E3.1	Technology/Security Floor Plan
200 E3.2	Annex Building Technology/Security Plan
200 E3.3	Electrical Schedules & Details
200 E3.4	Electrical Schedules & Details

Project #3 – Thompson Field

300 C1.1	Thompson Field Site/Electrical Plan
300 C1.2	Thompson Field Details
300 C1.3	Thompson Field Light Pole Foundation Details
300 C1.4	Bleacher Renovations

End of Section 00850

PART 1 GENERAL

1.01 DESCRIPTION

A. Addenda are written or graphic instruments issued prior to execution of construction contracts which add to, delete from, clarify, or correct the Bidding Documents and/or the Contract Documents.

B. Addenda may be included in the Bidding Documents and may be included in the Contract Documents.

C. Addenda will be issued by the Engineer as deemed necessary to facilitate the building and construction of the Project.

1.02 BIDDERS' AND CONTRACTORS' RESPONSIBILITIES

A. Each Bidder shall be responsible for taking the provisions of all Addenda issued prior to the Bid Date into account during the presentation of his Proposal.

B. Each Bidder shall be responsible for obtaining all Addenda, and for ascertaining that all Addenda issued prior to the Bid Date have been considered in preparing his Proposal.

C. Each Contractor shall perform his work in accord with Addenda.

End of Section 00900

PART 1 GENERAL

1.01 PROJECT DESCRIPTION

A. **2012 Architectural & Electrical Renovations - Hudson Area Schools**

1.02 CONTRACTORS USE OF PREMISES

A. Contractors shall limit their use of the Project site for Work and for storage, to allow for:

1. Work by other Contractors.

B. Contractors shall coordinate their use of the Project site under the direction of the Engineer.

C. Contractors shall assume full responsibility for the protection and safekeeping of materials and equipment stored on the site. No security will be employed.

D. Each Contractor shall move any stored material or equipment under his control if it interferes with operations of the Owner or other Contractors, as directed by the Engineer.

E. Contractors shall obtain and pay for additional storage or work areas needed for operations not allowed on the site.

1.03 OWNER OCCUPANCY

A. The Owner intends to occupy the **Project** by **August 17, 2012**. All contractors must comply with this requirement.

1.04 OWNER-FURNISHED PRODUCTS

A. Products furnished and paid for by the Owner are described in the Specifications and in the Bid Division List (Section 00309).

B. Owner's Responsibilities Regarding Owner-Furnished Products:
1. Arrange for and deliver necessary shop drawing, product data and samples to the installing contractor,
2. Arrange and pay for product delivery to the site, in concert with the Short Term Construction Activities Plan,
3. Arrange for the suppliers to submit bills of materials to Contractors,
4. Inspect deliveries jointly with Contractors,
5. Submit claims for transportation damage,
6. Arrange for replacement of damaged, defective, or missing items,
7. Arrange for manufacturer's warranties, bonds, service, and inspections, as required.

C. Contractor's Responsibilities, Regarding Owner-Furnished Products:
   1. Designate needed delivery dates for each product in the Short Term Construction Activities Plan,
   2. Review shop drawings, product data and samples,
   3. Review and return Owner-Furnished shop drawings, data and samples with notification of any discrepancies or problems anticipated in the use of the product,
   4. Promptly inspect products jointly with the Owner, and record shortages, damaged items and defective items,
   5. Handle products at the site, including uncrating and storage,
   6. Protect products from exposure to elements, and other forms of damage,
   7. Assemble, install, connect, adjust and finish products as stipulated in the Specification,
   8. Repair or replace items damaged by Contractor,
   9. Dispose of all crating, wrapping, and trash related to the material.

End of Section 01010

PART 1 GENERAL

1.01 NORMAL WORK HOURS

A. 7 a.m. to 5 p.m., Monday through Friday.

1.02 EXCEPTIONS

A. Necessary variations for normal hours shall occur only with the express approval of the Construction Coordinator on the Owner's behalf.

B. Overtime will not be paid.

C. It will be the responsibility of each contractor to provide an adequate workforce to assure the timely completion of all work.

D. The contractor will work whatever hours required (overtime, weekends, holidays) to complete their work and allow for the completion of all other work to achieve final completion in the time frames required by the Owner.

End of Section 01030

PART 1 GENERAL

1.01 CONSTRUCTION MANAGEMENT

A. This is a Construction Management Project. There is no General Contractor. All Contractors on this Project are Prime Contractors. The Owner and/or the Engineer will award separate contracts for all Bid Divisions involved in the Project. The Project will be controlled and administered by the Engineer and Construction Coordinator.

1.02 WORK ASSIGNMENTS

A. Nothing contained on the Contract Documents, and especially in the work scope of any Bid Division, shall be construed as a Work assignment to any construction industry trade. Each Contractor is responsible for his own decisions on Work assignments, and shall make them in accord with the prevailing practice in the area of the Project, and in such a way that neither his progress nor the progress of others will be adversely affected.

B. Disputes that may arise over improper assignments or over assignments claimed by more than one Contractor shall be settled immediately by the Contractors and shall in no case result in a slow down or stoppage of the Work of any Contractor.

1.03 RETAINAGE ON OWNER PURCHASED ITEMS

A. The Owner may retain an amount of Five Thousand Dollars ($5,000.00), or ten percent (10%) whichever is the larger amount, on material and/or equipment purchased from suppliers for inclusion in the Work, until such time as it is satisfactorily installed. The purpose of this provision is to ensure proper conformance to the Contract Documents.

1.04 PERFORMANCE OF THE WORK

A. All Contractors shall provide weekly input to the Short Term Construction Activities Plans (CAP) by which the Project will be built. Consequently, it is the responsibility and obligation of each Contractor to utilize his manpower and resources according to the commitments made under the Short Term CAP scheduling process.

1.05 PROMPTNESS OF EXECUTION

A. It is the intention of the Owner to complete the Project in the fastest practical time frame. Whereas varying conditions inherent in the construction process will affect the progress of the Work, it is the intent of each construction contract that the Contractor maintain the progress pace set forth in the CAP schedule.

1.06 PROGRESS PAYMENTS

A. It is the intention of the Owner to recognize timely performance as prescribed in the CAP. Contractors who maintain specified progress will be eligible for 100% Progress Payments.

B. Contractors who fail to maintain specified progress may be subject to retainage up to 100% of Progress Payments at such times as those Contractors are judged by the Engineer to be behind Schedule.

1.07 PAYMENT FOR STORED MATERIALS

A. As a means of eliminating escalation on available items of material and equipment, and in the interest of obtaining competitive Bids, the Owner will provide payment for contract items purchased early and stored off, as well as on, the Project site. In order to qualify for such payment, the material or equipment must be safely stored, protected and insured against loss or damage, inspected and dedicated to this Project only. Any extra cost of off-site storage is to be included as part of the Bid Proposal.

B. Materials stored on the site shall be in the area designated by the Construction Coordinator. Materials or equipment lost through theft or mishandling shall be replaced by the Contractor without cost to the Owner. The contractor receiving materials shall provide and maintain protection of stored materials at no additional cost to the Owner.

C. Requests for payment for materials delivered and stored at the site must have acceptable itemized bills attached and available at the time of delivery.

1.08 SCHEDULE OF VALUES

A. The Schedule of Values (Section 00670) shall include two mandatory items for any Contractor who provides on-site labor as part of his contract: "Housekeeping and Final Clean-up" and "Punch List."

B. Monthly allocations shall be made to each item as appropriate, and as directed by the Engineer.

C. The value of the "Punch List" item shall be ten percent (10%) of the contract value, or as described by the Engineer.

D. The value of the "Housekeeping and Final Clean-up" item shall be one percent (1%) of the contract value, or as described by the Engineer.

1.09 MATERIAL AND EQUIPMENT EXPEDITING

A. Each Contractor shall require all manufacturers to notify their office twenty-four (24) hours in advance of arrival on jobsite so Contractor can arrange for unloading of equipment/materials.

B. The Construction Coordinator will initiate and coordinate an expediting program on the Owner's behalf in cooperation with each Contractor, incorporating all critical items of material and/or equipment provided under the various Bid Division contracts.

C. In order to ensure timeliness and accuracy, each Contractor shall cooperate by providing order and acknowledge documentation, without pricing, as required by the Construction Coordinator, on the Owner's behalf.

D. Each Contractor shall further cooperate by keeping the Construction Coordinator informed of all changes in the commitments previously incorporated in the expediting program, and, when deemed necessary by the Construction Coordinator, provide source contacts for direct expediting by the Construction Coordinator.

E. The Construction Coordinator expediting activities are to be considered a back-up program, and shall not in any way relieve individual Contractors of performance responsibilities under the Contract Documents.

1.10 PROTECTION OF THE WORK OF OTHERS

A. Contractors shall consider protection of finished Work of prime importance. Care shall be taken by Contractors not to damage completed Work of other Contractors, and to provide adequate protection for their own completed Work.

B. When moving men and/or materials across floors, grades, roofs, other vulnerable surfaces or through occupied areas, the Contractor shall provide adequate surface protection to prevent damage to surfaces.

1.11 MANDATORY ATTENDANCE AT MEETINGS

A. It is the responsibility of each Contractor to be suitably represented at all Project and Progress Meetings, as determined by the Construction Coordinator.

1.12 PRE ON-SITE ACTIVITY MEETING

A. Each Contractor is required to meet on the site with the Construction Coordinator prior to beginning his Work. The purpose of this meeting is to review the intent of the Contract Documents as they pertain to the Contractor's Work and to integrate the Contractor's schedule into the Short Term Construction Activities Plan for the Project.

1.13 RETURN ACTIVITIES

A. Each Contractor is required to report to the Construction Coordinator prior to resuming Work on the Project after an absence from the site of one or more working days. The purpose of reporting is to make the Engineer aware of the Contractor's reinvolvement with the Project, and to provide an update regarding any conditions that could affect the continuing Work of the Contractor.

1.14 CUTTING AND PATCHING

A. Each Contractor shall make arrangements with the Construction Coordinator for fitting his Work into the Project, and shall coordinate all fitting with other Contractors. Whenever any contractor has been given sufficient information as to required openings prior to beginning his Work, he shall pay the cost for cutting and/or restoring if he fails to provide proper required openings.

B. Each Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work if he has failed to properly notify the Construction Coordinator and preceding

Contractors of any openings required. Contractors shall not endanger the Work of any other Contractor by cutting, excavating or otherwise altering any Work, and shall not cut or alter the Work of any other Contractor except with the consent of the Construction Coordinator. Any costs caused by defective or ill-timed Work shall be borne by the party responsible for such Work.

C. Cutting or restoring performed by any Contractor which is rejected by the Construction Coordinator shall be corrected. The cost of such Work shall be borne by the Contractor responsible for the defective restoration.

D. Openings over six inches in diameter must be formed by the concrete contractor(s) or masonry contractor(s).

E. Cutting and patching of concrete floors and decks shall be performed in a neat and workmanlike manner, using a coring machine. After coring, each Contractor shall pack and grout openings around sleeves or other Work penetrating floors and decks.

F. No Contractor shall do any cutting that may impair the strength of any building or its components. No holes, except for small screws or bolts, may be drilled in beams or other structural members for the purpose of supporting or attaching Mechanical Work, without prior approval from the Construction Coordinator.

G. Each Contractor shall be responsible for the cutting and patching of all holes and openings through existing walls and partitions, and all holes and openings through existing floors, ceilings, and roofs necessary for the installation of his work. If the location for a hole or opening is through an existing joist, beam, or column, the Contractor shall notify the Construction Coordinator who will instruct the Contractor how to proceed.

H. Each Contractor shall be responsible for the closing and patching of holes and openings through existing walls, partitions, floors, ceilings, and roofs created by demolition work he is shown to complete unless noted otherwise.

I. Temporary removal and replacement of all ceilings not scheduled to be replaced shall be the responsibility of the Contractor requiring access.

J. The Contractor responsible for patching shall provide both the rough (substrate) and finish surfaces. He shall employ only qualified tradesmen to assure that all work is done in a neat and workmanlike manner. All patching shall match adjacent surfaces.

1.15 BLOCKING, BACKING, AND GROUNDS

A. Each Contractor shall be responsible for providing the blocking, backing, and grounds necessary for the installation of his work unless specifically noted on the drawings in which case said blocking, backing, and grounds shall be provided by the Bid Division supplying shown backing material.

1.16 ACCESS PANELS

A. Each contractor shall be responsible for furnishing the necessary access panels for items of work installed under his contract.

B. Installation of all access panels shall be the responsibility of the contractor erecting the Wall or ceiling system.

C. If not specified, these access panels shall be approved by the Construction Coordinator prior to installation.

End of Section 01040

PART 1 GENERAL

1.01 LAYOUT AND MEASUREMENTS

A. The responsibility for accurate layout and measurement of the Work of each Contractor is his own. In addition the Contractor shall verify the dimensional accuracy of the Work upon which his own Work relies before he begins his own Work. He shall report all inaccuracies to the Engineer and shall not proceed until corrections are made. If a Contractor proceeds with his Work on dimensionally inaccurate Work, he shall be liable for the cost of corrections to his own Work when the error is corrected, and shall cooperate in the correction, as directed by the Engineer.

B. The Owner, through the Construction Coordinator, will provide a bench mark and baseline for all Contractors' reference.

End of Section 01050

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included:
1. Throughout the Contract Documents, reference is made to codes and standards which establish qualities and type of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics.
2. Where materials or workmanship are required by these Contract Documents to meet or exceed the specifically named code or standard, it is the Contractor's responsibility to provide materials and workmanship which meet or exceed the specifically named code or standard.
3. It is also the Contractor's responsibility, when so required by the Contract Documents or by written request from the Owner, to deliver to the Owner all required proof that the materials or workmanship, or both, meet or exceed the requirements of the specifically named code or standard. Such proof shall be in the form requested in writing by the Owner, and generally will be required to be copies of a certified report of tests conducted by a testing agency approved for that purpose by the Owner.

B. Related Work Described Elsewhere:
1. Specific naming of codes or standards occurs on the Drawings and in other Sections of these specifications.

1.02 QUALITY ASSURANCE

A. Familiarity with Pertinent Codes and Standards:
1. In procuring all items used in this Work, it is the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements.

B. Rejection of Non-Complying Items:
1. The Owner reserves the right to reject items incorporated into the Work which fail to meet the specified minimum requirements.
2. The Owner further reserves the right and without prejudice to other recourse the Owner may take, to accept non-complying items subject to an adjustment in the Contract Amount as approved by the Owner.

C. Applicable standards listed in these Specifications include but are not necessarily limited to, standards promulgated by the following agencies and organizations:
1. *AASHTO* American Association of State Highway and Transportation Officials, 341 National Press Building, Washington, D.C. 20004.
2. *ACI* American Concrete Institute, Box 19150, Redford Station, Detroit, Michigan 48219.
3. *AISC* American Institute of Steel Construction, Inc., 1221 Avenue of the Americas, New York, New York 10020.
4. *ANSI* American National Standards Institute (successor to USASI and ASAO), 1430 Broadway, New York, New York 10018.
5. *ASTM* American Society for Testing Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.
6. *AWS* American Welding Society, Inc., 2501 N.W. 7th Street, Miami, Florida 33125.

7. *AWWA* American Water Works Association, Inc., 6666 West Quincy Avenue, Denver, Colorado 80235.

8. *BOCA* Buildings Officials & Code Administrators International, Inc., 17926 South Halsted Street, Homewood, Illinois 60460.

9. *CRSI* Concrete Reinforcing Steel Institute, 228 North LaSalle Street, Chicago, Illinois 60610.

10. *CS* Commercial Standard of NBS, U.S. Department of Commerce, Government Printing Office, Washington, D.C. 20402.

11. *FGMA* Flat Glass Marketing Association, 3310 Harrison, Topeka, Kansas 66611.

12. *State of Michigan Fire Marshal Bulletin 412.0*.

13. *State of Michigan Department of Labor Barrier Free Code*.

14. *NAAMM* The National Association of Architectural Metal Manufacturers, 1033 South Boulevard, Oak Park, Illinois 60302.

15. *NEC* National Electrical Code (see NFPA).

16. *NEMA* National Electrical Manufacturers Association, 155 East 44th Street, New York, New York 10017.

17. *NFPA* National Fire Protection Association, 470 Atlantic Avenue, Boston, Massachusetts 02210.

18. *SDI* Steel Deck Institute, 135 Addison Avenue, Elmhurst, Illinois 60125.

19. *SSPC* Steel Structures Painting Council, 4400 Fifty Avenue, Pittsburgh, Pennsylvania 15213.

20. *TCA* Tile Council of America, Inc., P.O. Box 326, Princeton, New Jersey 08540.

21. *UL* Underwriters' Laboratories, Inc., 207 East Ohio Street, Chicago, Illinois 60611.

22. *Fed. Specs. and Fed. Standards*:
Specifications Sales (3FRI), Building 197, Washington Navy Yard, General Service Administration, Washington, D.C. 20407.

23. *UBC* Uniform Building Code, International Conference of Building Officials, 5360 South Workman Mill Road, Whittier, California 90601.

End of Section 01085

PART 1 GENERAL

1.01 DESCRIPTION

A. This section identifies each alternate by number and describes the basic changes to be incorporated into the work, only when that alternate is made a part of the Work by specific provisions in the Owner-Contractor Agreement.

B. Related Requirements in other parts of the Project Manual:
   1. Method of quotation of the cost of each alternate, and the basis of the Owner's acceptance of alternates: Bidding Documents.
   2. Incorporation of alternates into the Work: Owner-Contractor Agreement.

C. Related Requirements Specified in Other Sections:
   1. Part 1.01: Description of Work
   2. Sections of the Specifications as listed under the respective Alternates.

D. Referenced sections of specifications stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

E. Coordinate pertinent related work and modify surrounding work as required to properly integrate the work under each Alternate and to provide the complete construction required by the Contract Documents.

1.02 DESCRIPTION OF ALTERNATES

Bid Division 100-1 – Lincoln Elementary School
100-1: Cafeteria Cavity Wall Flashing
100-2: Cafetia Wall Masonry Tuckpointing & Clear Liquid Water Repellant
100-3: Computer Room Cooling
100-4: Bus Drop-off Lighting
100-5: Retaining Wall Precast Cap
100-6: Cafeteria Clerestory Window Replacement
100-7: 1968 Addition Window Replacement
100-8: EPDM Roof
100-9: Gym Sports Floor Replacement

Bid Division 200-1 – High School/Middle School
200-1: New Asphlt Base for Track
200-2: Granulated Rubber Surface for Track
200-3: Replace Board Office Driveway & Parking Lot
200-4: Annex Building Additional Master Clocks
200-5: EPDM Roof
200-6: Shingle Roof Replacement
200-7: Replace Stalls at HS Gym Lobby Bathrooms
200-8: (Not used)
200-9: New Bus Parking – Gravel
200-10: New Bus Parking – Paved

200-11: Bus Carport
200-12: Exit Driveway
200-13: Boiler Room Interior Finishes
200-14: New Shower Room Tile Flooring
200-15: (Not Used)
200-16: Replace 1600 Amp Main Circuit Breaker

Bid Division 300-1 – Thompson Field:
Alternate 300-1 – Football Field Lighting at 40 Footcandles

END OF SECTION

PART 1 GENERAL

1.01 PRE-CONSTRUCTION MEETING

A. Prior to the initiation of on-site activity, a meeting will be held with all Bid Division Contractors for the purpose of planning, scheduling and coordinating an orderly initiation of on-site construction activity. Attendance at this meeting is required of all successful Bidders. The Construction Coordinator will advise all contractors of the time and location of this meeting.

1.02 PRE-CONSTRUCTION CONFERENCES

A. Each Contractor is required to meet on the site with the Construction Coordinator prior to beginning his Work. The purpose of this meeting is to review the intent of the Contract Documents as they pertain to the Contractor's Work, and to integrate the initiation of that Work with the Work already in progress on the site.
    1. One such meeting is planned on or about May 14th for the purpose of planning for the beginning of construction.

1.03 PROGRESS AND PROJECT MEETINGS

A. Contractors and Subcontractors active on site shall be required to attend Progress and Project Meetings when called by the Construction Coordinator. These meetings are for the purpose of planning and assessing construction progress and for discussing problems of mutual concern.

B. It shall be mandatory that each Contractor and his superintendent, foreman or lead person be in attendance at these meetings, or the Owner may withhold the Contractor's payment.

C. All decisions, instructions and interpretations given by the Owner or his designated representatives at these meetings shall be conclusive, and shall be binding on the Contractors.

D. The proceedings of such meetings will be recorded and posted. Copies will be forwarded to Contractors.

End of Section 01200

PART 1 GENERAL

1.01 CONSTRUCTION SCHEDULES

A. Each Contractor shall submit to the Construction Coordinator, at or prior to the Pre-Construction Meeting, **two (2) copies** of an estimated progress schedule for his Work for incorporation into the Project Construction Schedules.

B. The quality and completeness of the Work shall be maintained on a day-to-day basis. Inaccurate, faulty, incomplete and defective Work shall be corrected by the Contractor without continuous prodding by the Engineer. Failure to cooperate in this Continuous Punch List effort may reduce Progress Payments.

1.02 SHOP DRAWINGS, PRODUCT DATA & SAMPLES

A. Contractors shall submit all shop drawings, product data, and samples required by the Construction Documents.

B. Submittals shall be transmitted to the the Engineer's office in accord with procedures and dates prescribed by the Engineer.

C. In submitting shop drawings, product data and samples, each Contractor represents that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. All submittals must be stamped or signed by the contractor responsible for submitting, to attest to their review.

D. The Contractor shall not be relieved of responsibility for any deviation from the Contract Documents, or any errors and omissions in shop drawings, product data or samples by the Engineer's approval thereof.

E. No portion of the Work requiring submission of shop drawings, product data or samples shall be commenced until the submission has been approved by the Engineer.

F. **FOUR (4)** Shop drawings, product data, and samples and color charts must be submitted. Four (4) copies will be retained by the Engineer.

1.03 PRE-CONTRACT AWARD SUBMITTALS

A. (Refer to Sections 00100, 00600, 00650, 00670, 00680, and 00690.)

1.04 CONTRACT CLOSEOUT SUBMITTALS

A. (Refer to Sections 00700, 01700, 01720, 01730, and 01740.)

End of Section 01300

PART 1 GENERAL

1.01 QUALITY CONTROL BY ENGINEER

A. Each Contractor shall comply with the quality control provisions of the Contract Documents.

B. The quality and completeness of the Work shall be maintained on a day-to-day basis. Inaccurate, faulty, incomplete and defective Work shall be corrected by the Contractor without continuous prodding by the Construction Coordinator. Failure to cooperate in this continuous punch list effort may reduce Progress Payments.

1.02 CONTRACTOR QUALITY CONTROL

A. Each Contractor shall be responsible to provide a quality of workmanship consistent with the requirements of the Contract Documents. All Work will be of good quality and free from faults and defects. Every care shall be exercised to ensure that the quality specified is the quality provided.

B. If at any time a Contractor is of the opinion that the quality of his Work is, or will be, jeopardized as a result of the scheduling or coordination of the project, or for any other reason known to him, he shall stop Work immediately and shall inform the Construction Coordinator of his action and the reasons therefore. The Contractor immediately shall provide a written explanation to the Engineer. Upon investigation by the Construction Coordinator, a decision will be made on the point of jeopardy, in order to resolve the problem.

End of Section 01400

PART 1 GENERAL

1.01 THE OWNER MAY EMPLOY AND PAY FOR THE SERVICES OF AN INDEPENDENT TESTING LABORATORY TO PERFORM SPECIFIED TESTING.

A. The Contractors shall cooperate with the Laboratory to facilitate the execution of this service.

B. Employment of the Laboratory shall in no way relieve the Contractor's obligation to maintain the quality of his work.

1.02 CONTRACTORS' RESPONSIBILITIES

A. The Contractors shall cooperate with Laboratory personnel, and shall provide access to Work, and to manufacturers' operations.

B. The Contractors shall provide to the Laboratory samples of proposed materials which require testing.

C. The Contractors shall provide to the Laboratory the preliminary design mix proposed to be used for concrete and other materials which require control by the Laboratory.

D. The Contractors shall furnish copies of test reports as required.

E. The Contractors shall furnish incidental labor and facilities necessary:
   1. To provide access to Work to be tested.
   2. To obtain and handle samples at the Project site or at the source of the project to be tested.
   3. To facilitate inspections and tests.

F. The Contractors shall notify the Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.

G. The Contractors shall make arrangements with the Laboratory and pay for additional samples and tests required for Contractors' convenience.

H. The Contractors shall comply with the Project Team's instructions regarding testing.

End of Section 01410

PART 1 GENERAL

1.01 DESCRIPTION

A. The Owner will allow each Contractor to use power and water, where available, for use in construction. All usage will be arranged for by the Engineer.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with the National Electric Code.

B. Comply with federal, state and local codes and regulations and with utility company requirements.

1.03 MATERIALS, GENERAL

A. Cords, connectors, etc. may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

1.04 TELEPHONE SERVICE

A. Telephone Service will be the responsibility of the contractor.

1.05 WATER

A. A temporary water distribution center will be provided in a nearby convenient location. The Contractor shall supply all hoses, etc. beyond that point.

1.06 SANITARY FACILITIES

A. Contractors will be provided access to existing designated facilities on site.

1.07 EXECUTION

A. Each Contractor shall maintain and operate systems to assure continuous service, and avoid disruption of service.

1.08 REMOVAL

A. Each Contractor shall promptly remove his own temporary materials and equipment when their use is no longer required.

B. Each Contractor shall clean and repair damage he has caused by temporary installations or use of temporary facilities.

C. Each Contractor shall restore existing facilities he has used for temporary services to their specified or original condition.

End of Section 01510

PART 1 GENERAL

1.01 DESCRIPTION

A. Each Contractor shall furnish, install and maintain construction aids required for the performance of his own Work, and shall move or remove them when they are no longer needed for the Work.

B. Certain construction aids will be provided for and maintained by the Owner as indicated in later paragraphs in this Section.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL

A. Materials may be new or used, shall be suitable for their intended purposes, and shall not violate the requirements of applicable codes and standards.

2.02 CONSTRUCTION AIDS

A. Each Contractor shall provide needed construction aids and equipment to facilitate the execution of the Work, including scaffolds, staging, ladders, and other such facilities and equipment.

B. Contractors shall maintain all facilities and equipment in a first-class condition.

2.03 TEMPORARY ENCLOSURES

A. The Construction Coordinator will arrange for temporary enclosures except those required by section 1900 - 2.01 to separate work areas from the areas of existing building occupied by the Owner to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, and to protect the Owner's employees, customers, and operations from construction work.

PART 3 EXECUTION

3.01 PREPARATION

A. Consult with the Owner, Construction Coordinator and other Consultants and review the site, conditions, and other factors which could affect construction procedures and construction aids, including adjacent properties and public facilities which may be affected by execution of the project.

3.02 GENERAL

A. Comply with applicable requirements of the Specifications.

B. Relocate construction aids as required by the progress of construction, by storage requirements, and to accommodate requirements of the Owner and other Contractors employed at the site.

3.03 REMOVAL

A. Completely remove temporary materials, equipment and services:
   1. When construction needs can be met by use of permanent construction.
   2. At the completion of the Project.

B. Clean and repair damage to the permanent facilities caused by installation or by use of temporary facilities.

C. Restore existing facilities used for temporary purposes to specified or original condition.

End of Section 01520

PART 1 GENERAL

1.01 SECURITY

A. Each Contractor shall bear full responsibility for protecting equipment, material and tools from damage, loss and vandalism.

B. The Owner will not provide security for this project.

End of Section 01540

PART 1 GENERAL

1.01 ACCESS ROADS

A. Contractors' access to the Project site and arrangements for periodic, temporary access for specific construction shall be made through the Construction Coordinator with the Owner's approval.

1.02 DELIVERY

A. Contractors receiving deliveries to site shall request a 24 hour notice of delivery from suppliers. Contractors receiving deliveries shall ensure that their personnel are at the site to receive deliveries, and properly store them.

B. Bidders of Divisions for supply only shall give 48 hour notice to the Construction Coordinator so proper arrangements can be made for unloading.

C. Any Contractors or Bid Division suppliers not giving proper notice shall reimburse Contractors at the site or be back charged accordingly for unloading and storage of said materials.

D. Since site space is limited, delivery of materials shall not be made to the jobsite before progress of the job schedule calls for it, unless approved by the Construction Coordinator.

1.03 PARKING

A. Contractor parking will be in an area designated by the Construction Coordinator on site.

End of Section 01550

PART 1 GENERAL

1.01 CONTROLS

A. Control of elements such as noise, dust, water, pests, rodents, debris, pollution, and erosion will be designated by the Construction Coordinator. Contractors shall be responsible to see that such measures are in strict conformance to local codes and restrictions.

End of Section 01560

PART 1 GENERAL

1.01 TRAFFIC REGULATIONS

A. Contractors shall abide by all governmental and Owner-established traffic regulations.

B. Contractors shall use the route designated by the Owner/Construction Coordinator and shall comply with the requirements of Section 01550.

End of Section 01570

PART 1GENERAL

1.01 DESCRIPTION

A. No signs shall be displayed by any Contractor.

End of Section 01580

PART 1 GENERAL

1.01 DESCRIPTION

A. The Project Office will be located in the High School, Room 302.

B. The Project Office will be used by the Owner and the Construction Coordinator.

C. Project meetings and progress meetings will be held in the on site, or at another location selected by the Construction Coordinator when deemed necessary.

1.02 TRAILERS, ETC.

A. Trailers to be used as an office and storage will be permitted. Approval must be obtained from the Construction Coordinator prior to moving on site and will be located as directed by the Construction Coordinator.

End of Section 01590

PART 1 GENERAL

1.01 NEW MATERIAL AND EQUIPMENT

A. Material and equipment incorporated into the Work shall:
   1. Conform to applicable specifications and standards,
   2. Comply with sizes, makes, types and qualities specified or as specifically approved in writing by the Engineer or Owner.

B. Manufactured and Fabricated Products:
   1. Design, fabricate and assemble in accord with the best engineering and shop practices.
   2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
   3. Two or more items of the same kind shall be identical, by the same manufacturer.
   4. Products shall be suitable for service conditions.
   5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by the Project Engineer.

C. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 MANUFACTURERS INSTRUCTIONS

A. When the Contract Documents require that installation comply with manufacturers' printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the Construction Coordinator.

B. Maintain one set of complete instructions at the site during installation, until completion.

C. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformity with specified requirements.
   1. Should job conditions or specified requirements conflict with manufacturers' instructions, consult with the Project Team for further instructions.

D. Perform Work in accord with manufacturers' instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by the Contract Documents.

1.03 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accord with the Short Term Construction Activities Plan. Coordinate to avoid conflict with Work and conditions at the site.
   1. Deliver products in undamaged condition, in manufacturers' original containers or packaging, and with identifying labels intact and legible.
   2. Immediately upon delivery, inspect shipments to assure compliance with the requirements of the Contract Documents and approved submittals, and to assure that products are properly protected and undamaged.

B. Provide equipment and personnel to handle products by methods which will prevent soiling or damage to products or packaging.

1.04 STORAGE AND PROTECTION

A. Store products in accord with manufacturers' instructions, with seals and labels intact and legible.
   1. Store products subject to damage by the elements in weather tight enclosures.
   2. Maintain temperature and humidity within the ranges required by Manufacturers' instructions.

B. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that the products are maintained under specified conditions, and are free from damage or deterioration.

C. Protection After Installation:
   1. Provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove the coverings when they are no longer needed.

1.05 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Products List:
   1. Before commencing Work, submit to the Engineer a complete list of major products proposed to be used, with manufacturers' and suppliers' names, product names, model numbers, and, where applicable, names of installing subcontractors. (Refer to Section 00680.)

B. Contractor's Options:
   1. For products specified only by reference standard, select any product meeting that standard.
   2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named, which complies with the specifications.
   3. For products specified by naming one or more products or manufacturers and "or equal," Contractors must submit requests for substitutions for any product or manufacturer not specifically named.
   4. For products specified by naming only one product and manufacturer, there is no option.

C. Substitutions:
   1. The Project Team will consider written requests from Contractors for substitution of products.
   2. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
      a. Comparison of the qualities of the proposed substitution with that specified,
      b. Changes required in other elements of the Work because of the substitution,
      c. Effect on the construction schedule,
      d. Cost data comparing the proposed substitution with the product specified,
      e. Any required license fees or royalties,
      f. Availability of maintenance service, and source of replacement materials.
   3. Engineer will be the judge of the acceptability of all proposed substitutions.
   4. Any request for a substitution constitutes a representation that the Contractor:
      a. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified,
      b. Will provide the same warranties or bonds for the substitution as for the product specified,
      c. Will coordinate the installation of accepted substitutions into the Work, and make such other Changes as may be required to make the Work complete in all respects,
      d. Waives all claims for additional costs which may subsequently become apparent.

5. The Engineer will review requests for substitutions and the Engineer's determination of acceptability with reasonable promptness, and will notify Contractors in writing of his decisions regarding requested substitutions.

End of Section 01600

PART 1 GENERAL

1.01 DESCRIPTION

A. Each Contractor shall comply with requirements stated in the General Conditions and in the Specifications for procedures in closing out the Work.

1.02 SUBSTANTIAL COMPLETION AND FINAL INSPECTION PROCEDURE

A. When the Contractor's work is 98% complete, and in compliance with Section 10 "Completion" of the Contract, the Contractor will be provided with a Certificate of Substantial Completion after proper certification by the Engineer. A list of Work in need of correction and a list of incomplete Work will be forwarded to the Contractor.

B. Each Contractor will be allowed thirty (30) days to complete the items on both of his lists beginning from the date stipulated on the Certificate of Substantial Completion. The Contract shall begin completion and correction activities within seven (7) days of receipt of the lists and complete all activities within the thirty (30) day period specified. Contractors failing to perform in accord with these time parameters will be subject to the provisions of the General Conditions, and the Owner will have the right to carry out the corrective Work and/or complete the Work. The Cost of correction or completion will be deducted from the Contractor's contract amount.

C. By the act of submitting the Certificate of Substantial Completion for execution by the Engineer the Contractor represents that he has:

1. Reviewed the Contract Documents.
2. Inspected his Work for compliance with the Contract Documents.
3. Completed his Work in accord with the Contract Documents and all pertinent submittals.

D. He further represents that:

1. Equipment and systems have been tested in the presence of the Owner's representative and are operational.
2. His Work is completed and ready for final inspection.

1.03 CONTRACTOR'S CLOSEOUT SUBMITTALS

A. Upon Substantial Completion, the Contractor shall submit the following:
1. Evidence of compliance with requirements of governing authorities, including Certificates of Inspection.
2. Operating and Maintenance Data, and Instructions to the Owner's personnel.
3. Warranties and Bonds.
4. Spare Parts and Maintenance Materials.
5. Evidence of Payment and Release of Liens.
6. Certification of Substantial Completion.
7. As Built Drawings

B. Three (3) complete sets of close out documents shall be provided to the owner upon Substantial Completion.

1.04 FINAL APPLICATION FOR PAYMENT

A. Each Contractor shall submit the final Application for Payment in accord with the procedures and requirements stated in the General Conditions.
B. Refer to Sections 01720, 01730, and 01740 for further information regarding submittals.

End of Section 01700

PART 1 GENERAL

1.01 DESCRIPTION

A. Each Contractor shall execute cleaning during the progress of the Work, as required by the General Conditions and the Specifications.

1.02 DISPOSAL REQUIREMENTS

A. Cooperate with project cleaning and disposal operation to insure compliance with codes, ordinances, regulations, and anti-pollution laws.

PART 3 EXECUTION

3.01 HOUSEKEEPING AND DAILY CLEAN-UP

A. Each Contractor shall execute daily housekeeping to keep his Work, the site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

B. Each Contractor is financially responsible for his own daily clean-up operations. Clean-up must be timely as well as thorough in order to meet safety regulations and permit other Contractors to perform without hindrance from dirt and debris. The Construction Coordinator will coordinate Project housekeeping and take appropriate steps to maintain clean, safe working conditions. Contractors failing to meet housekeeping requirements will be charged for services arranged by the Construction Coordinator.

3.02 FINAL CLEANING

A. The Construction Coordinator is responsible for final cleaning.

End of Section 01710

PART 1 GENERAL

1.01 DESCRIPTION

A. The Engineer will make available a set of Record Documents at the site including the following:
   1. Drawings
   2. Specifications
   3. Addenda
   4. Change Orders and other Modifications to the Contracts
   5. Written Instructions
   6. Approved Shop Drawings, Product Data and Samples
   7. Field Test Records
   8. Construction Photographs (if required)

1.02 RECORD DRAWINGS

A. As a condition of final payment, each Contractor shall mark any and all installation information that differs in location, size, dimension or type from that shown on the Construction Documents on a single set of Construction Documents.

1.03 SUBMITTAL

A. At Contract Close-out, each Contractor shall deliver three sets of Record Documents, as indicated in 01700.1.03B to the Engineer, for delivery to the Owner.

B. Each Contractor shall accompany his Record Document submittal with a transmittal letter in duplicate, containing:
   1. Date
   2. Project and Phase designation
   3. Contractor's name and address
   4. Bid Division name and number
   5. Title and number of each Record Document
   6. Signature of Contractor or his authorized representative

C. The receipt of such Record Documents by the Engineer or the Owner shall not be a waiver of any deviations from the Contract Documents.

End of Section 01720

PART 1 GENERAL

1.01 DESCRIPTION

A. Each Contractor shall compile product, data and related information appropriate for the Owner's maintenance and operation of products furnished under his Contract.

B. Each Contractor shall instruct the Owner's personnel in the maintenance of products and in the operation of equipment and systems.

1.02 MAINTENANCE AND OPERATING MANUALS

A. Prior to Substantial Completion, each Contractor shall submit to the Engineer three (3) copies of all comprehensive maintenance and operating materials, presenting complete directions and recommendations for the proper care and maintenance of all visible surfaces, as well as maintenance and operating instructions for all equipment items which the Contractor has provided or installed.

B. Operating instructions shall include all necessary printed directions for correct operation, adjustment, servicing and maintenance of movable parts. Also, included shall be suitable parts lists and diagrams showing parts location and assembly.

1.03 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, each Contractor shall fully instruct the Owner's designated operating and maintenance personnel in the operation, adjustment, and maintenance of all products, equipment, and systems.

B. Manufacturers' operating and maintenance manuals shall constitute the basis of instruction. Each Contractor shall review the contents of such manuals with the Owner's personnel in full detail to explain all aspects of operation and maintenance.

End of Section 01730

PART 1 GENERAL

A. Each Contractor shall submit three (2) original written warranties covering the work of his entire Bid Division(s) for the time periods stipulated in the Technical Specifications (or a minimum of one year if none shown) along with any other requirements of the Technical Specifications.

B. Each Contractor shall review all warranties prior to submittal to verify compliance with the Contract Documents.

C. Each Contractor shall submit all warranties to the Engineer for review and transmittal to the Owner.

PART 2 SUBMITTAL REQUIREMENTS

A. Each Contractor shall assemble all warranties and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Two original signed copies of each warranty are required.

PART 3 TIME OF SUBMITTALS

A. For equipment and component parts of equipment put into service during the progress of construction, submit documents within ten (10) days after inspection and acceptance.

B. Otherwise make submittals within ten (10) days after the Date of Substantial Completion, prior to the final request for payment.

C. For items of work where acceptance is delayed materially beyond the Date of Substantial Completion, provide an updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

PART 4 SUBMITTALS REQUIRED

A. Submit warranties as specified in the Conditions and Specifications.

End of Section 01740

PART 1 GENERAL

1.01 DESCRIPTION

A. It shall be the Contractor's responsibility to identity and properly manage any hazardous substances brought to the site.

B. The Contractor agrees to disallow any known carcinogen to be brought onto the jobsite at any time.

C. The Contractor shall notify the Owner in writing if he encounters existing materials that are suspected of being hazardous.

1.02 REQUIREMENTS

A. The Contractor shall provide:

1. Two (2) copies of each Material Safety Data Sheet (MSDS) for each of the hazardous materials used on the site.
2. Certification that the Contractor (and his subcontractors) has instructed the persons using the hazardous materials in their proper use.
3. For removal of any unused hazardous materials in their proper use.
4. Certification that no asbestos containing materials are being used or brought onto the site by signing and notarizing the asbestos free certificate.

B. The Contractor has the responsibility to make himself, his employees, and his subcontractors aware of any hazardous materials in the area of his specified work.

C. The above requirements must be fulfilled, in writing, at or prior to a pre-construction meeting by filling out the Contractor Hazardous Materials Compliance Form.

D. Standard safety practices and regulations as supplied by all governmental agencies will be in effect. Any violation will be justification of stop work on demand.

E. A list of district MSDS sheets is available on request.

Project Name: _____

Title: _____

CONTRACTOR HAZARDOUS MATERIALS COMPLIANCE

Contractor: _____

Address: _____

Contractor's Representative: _____

Phone: _____ Fax _____

Job Location: _____

This document certifies that the Contractor and any subsequent Contractors have complied with the terms set forth in the requirements of the contract documents for **Hudson Area Schools** as they pertain to hazardous materials.

The M.S.D.S.'s are attached for all hazardous materials which will be brought to the project site.

There are _____ M.S.D.S.'s attached.

The Contractor's employees (including subcontractors) have received appropriate instructions pertaining to the use and handling of hazardous materials.

The Contractor has been informed of hazardous materials in the area of the specified work.

_____
Signature of Contractor's Representative

Date: _____

Received by: _____

Date: _____

ASBESTOS FREE CERTIFICATE

Contractor: _____

Company Name: _____

Street: _____ City: _____ State: _____ Zip: _____

Project: _____

Bid Division: _____

Name of Building(s) in which work was performed:

_____

_____

Certificate Statement:

I _____, representing and having authority for _____ , hereby certify that any and all products/materials that will be or have been installed/introduced in the above mentioned buildings, are asbestos free or less than one percent (1%) asbestos by weight.

Execution: _____

Print Name: _____ Position: _____

Signature: _____

Company: _____

Date: _____

Notary Public: _____

My Commission Expires: _____

End of Section 01800

PART 1GENERAL

1.01 NOTICE

A. This notice is to formally advise you, per AHERA Requirements, that all buildings have asbestos containing materials present. All areas testing positive for asbestos are documented in booklets located in the office of the field construction coordinator.

1.02 DESCRIPTION

A. All thermal insulation such as pipe wrap, especially joints, are or should be assumed to contain asbestos. Contractors are cautioned not to attempt removal of these materials without first notifying the Owner.

End of Section 01805

PART 1 GENERAL

1.01 CODES

A. All work shall comply with the applicable requirements of the local and state building code and accident and fire prevention regulations.

1.02 SCOPE

A. The Work covered by this section of Specifications includes, but is not limited to, the following:

B. Demolish and remove existing materials as shown on the plan and noted in the Description of Work.

C. Cover holes and other hazardous openings with approved materials and barriers.

D. Remove all demolition materials and debris from the work area and dispose of in dumpsters provided by the construction coordinator.

E. Protect adequately the construction site, adjoining property, and utility services as work proceeds through all stages. Daily cleanings of debris and work area required.

1.03 QUALITY ASSURANCE

A. Contractor's staff responsible for demolition shall be experienced in this type of work. Equipment is to be of suitable type, in good working condition, and operated by skilled mechanics.

PART 2 PRODUCTS

2.01 TEMPORARY ENCLOSURES

A. The Construction Coordinator will be responsible for any desired/required temporary enclosures.

PART 3 EXECUTION

3.01 GENERAL INSTRUCTIONS

A. All work shall be done in a safe and cautious manner in order to avoid accidents and property damage.

B. Protect the work scheduled to remain, and if damaged, repair to match existing work.

C. All salvaged material, unless otherwise noted on plans or in the Description of Work shall become the property of the Owner.

D. Protect parts of the existing work scheduled to remain. Cut away carefully the parts to be demolished to reduce the amount of necessary repairs.

G. Support existing structure as needed during cutting of new openings or replacement of structural members.

H. Prevent accumulation of debris and overloading of any part of the structure.

I. Prevent access of unauthorized persons to partly demolished areas.

End of Section 01900

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

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02520 High School/Middle School Parking Lots & Drives
02530 High School/Middle School Track
02540 Seal Coating

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03300 Concrete

Division 4 – Masonry
04270 Unit Masonry
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Division 5 - Metals
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2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

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2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 02510

LINCOLN ELEMENTARY PARKING LOTS & DRIVES

SCOPE OF WORK AND SPECIFICATIONS

Request for a proposal to reconstruct the existing parking lot and drives. The undersigned bidder has examined the specifications and the location of the work described in the proposal for this project and is fully informed as to the nature of the work and the conditions at the existing site.

The bidder hereby proposes to furnish all necessary machinery, tools, apparatus and other means of construction; do all the work; furnish all the materials except as otherwise specified; and, for the lump-sum and/or unit prices indicated, to complete the work in strict accordance with the specifications included in this proposal and in strict conformity with the requirements of the current Standard Specifications for Construction, Michigan Department of Transportation, and such other special provisions, and other specifications as included in this proposal.

The successful bidder must provide any and all permits that may be required by the State of Michigan, The City of Hudson, Lenawee County, or any other controlling agency or entity.

The undersigned further proposes to do such extra work as may be authorized by the owner. Compensation shall be made on the basis agreed upon before such extra work is begun.

I. SCOPE OF WORK

It is the intent of this project to cold-mill the existing asphalt pavement from the existing parking lot, where directed, to a depth appropriate to accommodate the new cross section of pavement. After the pavement is removed, and where indicated, new underdrains shall be furnished, installed and connected to the existing and new drainage structures. Once that is completed, the contractor shall perform a full depth, chemical stabilized base course, using a single cut process, thereby creating an in-place stabilized base course. The technical specifications for this process are outlined below. The driveways shall be expanded as shown and spoils from this process shall be utilized as base in the widened areas. Any excess material generated by this process and unable to be utilized in this project shall be removed from the site and properly disposed. This shall be included as unclassified earth excavation. Throughout the duration of this project, the contractor shall have available a water truck, capable of sprinkling the grade, and maintaining the moisture content of the aggregate base to within two percent on either side of the optimum moisture content. The costs associated with this shall be included in the lump sum price. Once the preceding work has been completed the contractor shall proof roll the existing base with a loaded truck, which meets the approval of the engineer, to determine if there are any soft or unstable areas. If any of these conditions are encountered, the contractor will do subgrade undercutting, type II as indicated by the engineer. In these undercut areas,

drainable fill shall be used up to the bottom of the existing aggregate base. Aggregate base required to complete the undercut areas shall be acceptable to the engineer. This item shall be included by the cubic yard. Any additional aggregate required to bolster the existing base shall be paid for by the ton.

Once the preceding work has been completed, asphalt pavement will be placed. The new asphalt pavement shall consist of three inches of 13A Modified base course followed by 1-1/2 inches of 36A Modified surface. The technical specifications for these mixes are outlined below.

Minimum traffic control shall provide for safe ingress and egress, and protection of employees, students and local residents from the construction operation. A traffic control plan provided by the contractor shall be approved by the engineer.

All materials not incorporated into the work will be removed from the site; any areas that are disturbed by the construction will be repaired to a “like” condition.

Contractor is responsible for all utility marking, layout, and grade staking.

The exigencies of a pending MDOT contract to construct a new walking/bicycle path may preclude completion of this project prior to completion of this work. Should that occur, this contract shall be completed through the leveling course, construction of the path completed, then the surface course placed and compacted. Any and all damage to the leveling course, and/or the aggregate base, shall be repaired by the walking path contractor at no expense to Hudson Area Schools, Dailey Engineering, or the schools contractor. Coordination of these two projects is vital.

The successful bidder shall furnish separate performance and payment bonds, each with limits of 100 percent of the contract sum. Bonds shall be co-oblige bonds naming both the owner and Dailey Engineering, Inc. as principals. Bonds shall be secured from bond organizations licensed to underwrite within the State of Michigan, and both form and substance shall be subject to the review and approval of the owner and Dailey Engineering, Inc.

Prior to determination of bonding, and therefore, award, the successful bidder shall be prepared to provide evidence of experience and financial stability as may be requested by the owner or Dailey Engineering, Inc., including audited financial statements.

1a. Scope of Work Associated With City Bike Path

To simplify construction coordination between the Lincoln Elementary Parking Lot work and the City Bike Path work, some of the Bike Path work (primarily drainage provisions) is included with this contract. The scope of this work is shown on Fleis & Vandenbrink drawings C5 and C6. A list of items and quantities is included as Attachment #1 to this specification. Following contract award, this schedule of work shall be listed as a separate item in the “Schedule of Valves”, and the amount will be used for determining compensation from the City of Hudson to Hudson Area Schools.

II. TERMINOLOGY

Quality Control (QC) - All activities that have to do with making the quality of a product according to specifications, including training, materials sampling and testing, project oversight, and documentation.

Quality Assurance (QA) - All activities that have to do with making the quality of a product according to specifications including materials sampling and testing, construction inspection, and review of contractor quality control documentation.

Bituminous Mix Design - The selection and proportioning of aggregate(s), mineral filler (if required), reclaimed asphalt pavement (RAP) and asphalt binder such that the specified mixture design criteria are met. Laboratory evaluation is required to determine if the stated mix design complies with specifications.

Job Mix Formula (JMF) - A bituminous mixture for a specific project. This may include adjustments to the mix design to optimize the field application.

Target Value - A JMF parameter value that may be adjusted, if approved by the engineer, to account for changes in the physical properties of the mixture.

JMF Adjustment - The contractor may propose an adjustment to the JMF based upon QC and/or QA test results. The proposed JMF must meet the requirements of the 2003 Standard Specifications for Construction. When approved by the engineer, a JMF adjustment may be applied retroactively to one lot, for parameters with target values.

Voids in Mineral Aggregate (VMA) - The volume of void space between the aggregate particles of a compacted paving mixture that includes the air voids and the asphalt binder, including the absorbed asphalt binder, expressed as a percent of the total volume of mixture.

Effective Specific Gravity (Gse) - The ratio of the oven dry weight in air of a unit volume of an aggregate (excluding voids permeable to asphalt) at a stated temperature to the weight of an equal volume of water at a stated temperature.

Bulk Specific Gravity of Aggregate (Gsb) - The ratio of the oven dry weight in air of a unit volume of an aggregate at a stated temperature to the weight of an equal volume of water at a stated temperature.

Maximum Specific Gravity of Mixture (Gmm) - The ratio of the weight in air of a unit volume of an uncompacted bituminous paving mixture at a stated temperature to the weight of an equal volume of water at the same temperature.

Lot - Bituminous mixture produced and placed under this special provision is evaluated on a lot-by-lot basis. A lot is made up of a discrete tonnage of one mixture. Each lot is made up of three sublots. These sublots will be of approximately equal size up to a maximum of 2000 tons. The sublot size shall be approved by the engineer prior to the start of production. The contractor may request a change in the sublot size during production based upon the contractor's ability to produce a mixture that meets the specification contained within the

contract documents, and upon approval of the engineer.

If only one or two sublots are included in a lot at the end of production, they will be combined with the previous lot using the same mix, and this combined lot will be evaluated based upon all sublot samples.

Lot Average Test Result - The average of all sublot QA test results, for a specific parameter, for the lot. Test results for any sublot removed from the project will not be used in calculating a lot average. However, the replacement material will be tested and the results included in the lot average.

Process Quality Control Targets - These targets are established by the contractor based upon initial production lot test results (and from any approved trial run) for air voids, VMA, asphalt binder content and Gmm. QC tolerances will be applied to these established targets to determine the need for production changes, including stopping production, to control the quality of the product. Process quality control targets must be reported to the engineer prior to the end of placement of the second lot.

Rounding of Numbers - Rounding of numerical data will follow ASTM E 29-93a, as described in the MDOT Bituminous QC/QA Procedures Manual of Field Testing.

Random Sampling - Selection of QA samples (bituminous mixture and density) and verification samples will be by a random process managed by the engineer. The contractor will be given the opportunity to observe the sampling process. However, the random numbers selected and the sampling locations will not be revealed to the contractor until the time of sampling in order to avoid bias in the random sampling process.

III. SAMPLING AND TESTING

The following sampling and testing procedures are to be followed in completing this work.

ASTM D 1559-89 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (Section 4.5).

ASTM D 2172 Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

ASTM D 2041 Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

ASTM D 2726 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.

ASTM C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates.

ASTM C 117 Test Method for Materials Finer Than 75-µm (no. 200) Sieve in Mineral Aggregates by Washing.

ASTM E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

MTM (Michigan Test Method) 311 Determining Aggregate Gradation for Bituminous Mixture.

MTM 117 Determining Percentage of Crushed Particles in Aggregates.

MTM 118 Measuring Fine Aggregate Angularity.

MTM 110 Determining Deleterious and Objectionable Particles in Aggregates.

MTM 319 Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method.

MTM 313 Sampling Bituminous Mixtures.

Equipment. All equipment requirements to perform these sampling and testing procedures shall apply.

IV. QUALITY CONTROL (CONTRACTOR)

a. Bituminous Mixture: The contractor will take random samples of loose mixture at least every 400 tons of mixture, or a sampling frequency agreed upon with the engineer. The engineer will be provided a split sample of all QC samples taken by the contractor. This sample may be taken anywhere in the production process, except behind the paver. The contractor will be responsible for establishing process quality control targets for air voids, asphalt binder content, aggregate gradation, Gmm, obtaining QC samples, and conducting QC testing in accordance with the contractor's quality control plan (QCP).

Each QC sample shall be identified to allow all test reports to be linked to a specific lot or sublot within the project.

The contractor shall maintain daily control charts and have them available for review at the plant at all times. Copies of these control charts shall be provided to the engineer if requested. All test results shall be plotted and used in quality control decisions. When corrective action is necessary, the contractor shall notify the engineer in writing of the specific action taken, if it required a JMF adjustment.

b. In-place Density: The contractor will have a density gage available for quality control testing during the compaction process. The contractor will also have the capability to take 6" cores from random locations throughout the paved area for acceptance testing. The contractor may take up to three informational cores from each mixture type, to help correlate the density gage. Minimum in-place density shall average 95 percent of theoretical maximum density, Gmm.

V. QUALITY ASSURANCE (ENGINEER)

a. Bituminous Mixture: The engineer may collect bituminous mixture (loose) quality assurance samples and provide the contractor with splits of these samples.

If the criteria for the verification procedure are satisfied, the contractor's test results may be incorporated into the acceptance and payment decisions for the mixture. During the course of production, the engineer may acquire random samples at any point in the production process. These samples may be tested to determine if the mixture, the aggregate and the binder meet all of the specification requirements contained in the contract document. As the samples are collected, the engineer may assign an alphanumeric identifier to the sample and split, which can be used to trace the test results to the lot and sublot. This alphanumeric identifier may be included on all engineer test reports associated with that sample. An example is 4-2-A, which might designate the engineer's split (A) of the sample from sublot 2 of lot 4 on a project.

A minimum 16,000 gram sample may be taken. The sample will be divided equally for contractor and engineer testing. The following tests may be conducted by the engineer on the QA sample splits.

1. Maximum Specific Gravity, Gmm (ASTM D 2041)

2. Bulk Compacted Density (ASTM D 1559, paragraph 4.5)
3. Air Voids (calculated)

4. Voids in Mineral Aggregate, VMA (calculated)

5. Composition of the Mixture - Asphalt binder content based on calculated value using sublot maximum specific gravity (Gmm) and current JMF effective specific gravity (Gse). The retained Gmm sample may be used for gradation (ASTM C 136, C 117) and crushed particle content (MTM 117) from extracted (ASTM D 2172) or incinerated (MTM 319) aggregate, or from MTM 311.

b. In-Place Density: The engineer may identify random core sample locations for each sublot based on longitudinal and transverse measurements. The engineer will mark each core location with a paint dot, which represents the center of the core. The contractor shall drill a 6" core sample at each core location. The contractor shall notify the engineer sufficiently in advance of coring to ensure that a representative can be present to witness the coring and take possession of the core. The core density shall be calculated using the TMD from the test data obtained from that day's sample. The core samples shall be taken after final rolling.

As an option, when mutually agreed to by the engineer and contractor, the core samples may be waived and the density gage will be used for acceptance testing.

Core samples shall not be damaged during removal from the pavement. If, for any reason, a core is damaged or determined not to be representative at the time of coring, the engineer will evaluate and document the problem and determine if re-coring is necessary.

All previous pavement, base aggregate or bond coat material shall be sawed off the bottom of the core samples.

The core holes shall be filled with hot mixture and thoroughly compacted as part of the coring operation. The method of filling holes and obtaining compaction shall be agreed upon prior to production. Pavement density acceptance testing will be completed within one (1) work day after the cores were taken. Testing will be in accordance with ASTM D 2726. The test results on the compacted bituminous mixture will be used as a basis of acceptance and payment.

VI. VERIFICATION OF QUALITY CONTROL TEST

a. General Procedure: The engineer will review the contractor's sampling and testing procedures, their test results and any engineer quality assurance test results. If, in the opinion of the engineer, sampling and testing procedures are proper, the contractor's quality control test data may be used for acceptance decisions.

The contractor's QC test results may be considered verified if the following criteria are satisfied:

1. The difference between the contractor's QC test results and the JMF fall within the single test tolerance shown in Table 1, or
2. The difference between the engineer's test results and the contractor's test results fall within the single test tolerance shown in Table 1.

If the difference between the contractor's QC test results, compared to the JMF, exceed the single test tolerances shown in Table 1, the engineer's test results will be used as the acceptance test. If the sublot is not verified, the contractor shall be notified and given a copy of the test results. Both the contractor and the engineer will verify that testing equipment is calibrated and operating properly, and correct testing procedures have been followed. Unless it is documented that the difference resulted from equipment or procedural problems, the engineer's test results will remain as the acceptance test of record.

The cost of one verification test per mixture type shall be paid by the owner. Any additional mixture verification testing for acceptance shall be paid for by the contractor.

VII. PROJECT DOCUMENTATION

a. General: The format of all test reports and quality control charts to be submitted by the contractor will be approved by the engineer before mixture production is allowed to commence. Suggested formats of reports and charts are available from the engineer. Project documentation to be provided by the contractor shall include, but may not be limited to, the following.

b. Lot Basis:

1. A complete report of QC tests shall be submitted to the engineer within 24 hours of the time the last tests were completed.
2. Control charts of all test data must be current (data should be plotted as soon as the test is complete) and available for review by the engineer.

c. Project Summation:

1. Control charts for all test data indicating individual test values, lot averages and the running average of five.
2. A tabulation of all test data including sublot data, lot averages, project average, project standard deviation and a projection of which lots are subject to a price adjustment.

VIII. MEASUREMENT AND PAYMENT

Bituminous Mixture Price Adjustment

a. General: Adjustments to the contract unit price for bituminous mixture will be calculated for each of four sets of criteria. The largest adjustment allowable in each case will be imposed and unit price adjustments will be applied cumulatively (lot pavement density + pavement density + bituminous mixture + failure to suspend operations) to the affected tonnage. Each of the unit price adjustments is detailed below.

b. Bituminous Mixture: If, for asphalt binder content, air voids, Gmm or VMA, the difference between the lot average and the JMF is within the lot average tolerance shown in Table 2, no adjustment will be made to the unit price for **Bituminous Mixture** under this criteria. If the lot average tolerance is exceeded for one or more parameter(s), a negative adjustment will be made to the contract unit price for **Bituminous Mixture** in accordance with Table 2. Only the largest of the four possible pay adjustments for this set of criteria will be assessed. This price adjustment is applied to the entire lot tonnage.

c. Pavement Density: Based on pavement cores or the density gage, either a 10 percent or a 25 percent adjustment in the **Bituminous Mixture** contract unit price may be imposed. The following criteria will be used and only the highest calculated pavement density price adjustment will be applied. This price adjustment is applied to the entire lot tonnage.

1. A negative 10 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 95.0 percent, but equal to, or greater than, 94.0 percent.
2. A negative 25 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 94.0 percent, but equal to, or greater than, 92.0 percent.

IX. REMOVAL

a. General: The cost of the mixture removed and the removal cost will be borne by the contractor. Removal decisions will be applied to individual sublots.

b. If the pavement density for any sublot (average of sublot cores) is less than 92.0 percent, the contractor shall remove and replace the sublot.

c. The engineer reserves the right to evaluate any sublot whose test results for asphalt binder content, Gmm, VMA, or air voids, exceed the single test tolerances shown in Table 1. If the engineer determines that the in-place mixture will not perform in accordance with normal standards, the contractor shall remove and replace the sublot.

TABLE 1 : Bituminous Quality Assurance Testing Tolerances (+ or -) from JMF

Parameter	Single Test	Lot Average
Air Voids	1.00%	0.60%
Voids in Mineral Aggregate (VMA)*	1.20%	0.75%**
Maximum Specific Gravity (G_{mm})*	0.019	0.012
Asphalt Binder Content*	0.50%	0.35%

*Parameters with Target Values
**Or less, determined by VMA Value from the 2003 Standard Specifications for Construction.
The engineer retains the authority to make necessary adjustments to the JMF to ensure compliance with the intent of the specifications.

TABLE 2: Bituminous Mixture Pay Adjustments

Parameter (lot average)	Deviation (d)	Negative Unit Price Adjustment (%)
Asphalt Binder Content (deviation from JMF)	$0.35 < d \leq 0.55$	10
	$d > 0.55$	25
Air Voids (deviation from JMF)	$0.6 < d \leq 0.7$	2
	$0.7 < d \leq 0.8$	4
	$0.8 < d \leq 1.0$	6
	$1.0 < d \leq 1.1$	8
	$1.1 < d \leq 1.2$	10
	$d > 1.2$	25
Maximum Specific Gravity (G_{mm}) (deviation from JMF)	$0.012 < d \leq 0.014$	2
	$0.014 < d \leq 0.015$	4
	$0.015 < d \leq 0.017$	6
	$0.017 < d \leq 0.019$	8
	$0.019 < d \leq 0.021$	10
	$d > 0.021$	25
Voids in Mineral Aggregate (VMA) (deviation below minimum value in the 2003 Standard Specifications for Construction)	$0.0 < d \leq 0.1$	2
	$0.1 < d \leq 0.3$	4
	$0.3 < d \leq 0.4$	6
	$0.4 < d \leq 0.5$	8
	$0.5 < d \leq 0.6$	10
	$d > 0.6$	25

X. TECHNICAL SPECIFICATIONS

Section 304. Bituminous Mixtures

304.01 Description. Construct the bituminous leveling and surface courses.

The contractor will furnish all necessary machinery, tools, apparatus and other means of construction to do all the work, and furnish all the materials, except as otherwise specified, to complete the work in strict accordance with the plans and specifications included in this proposal, and in strict compliance with the 2003 Michigan Department of Transportation Standard Specifications for Construction and special provisions.

304.02 Technical Specifications

1. Mix Design

A 4 point, fifty blow each side, Marshall Mix Design will be completed for each mixture used on this project. This design will be done in accordance with the Asphalt Institutes MS-2 with the following clarifications. Two theoretical density (G_{mm}) tests will be conducted for each of the four test points, without dry back. The effective specific gravity (G_{se}) will then be calculated for each test point using the average $G_{mm,}$ and then the mixture G_{se} will be the average of the four test points. The completed mixture design will include all data from all test points and a regression table showing the following data for each 0.1% asphalt content; air voids, maximum theoretical specific gravity, compacted density, and voids in the mineral aggregate. This data, in its entirety, must be presented to and approved by the owner's representative at least two days before the mixture is placed.
It is the intent of this specification for the contractor to produce mixture at the following parameters. If the engineer believes the contractor is producing mixture at the high end or low end of any of these specification limits, the engineer shall have the authority to make any changes he feels necessary to bring the mixture back to the specified parameters.

A. MIXTURE NUMBER:	13A Mod.	36A Mod
VMA % (eff. spec. gravity)	15.5	16.5
Air voids %*	2.5*	2.5
Fines to binder ratio (max.)	1.2	1.2
Fine angularity min.MTM 118	2.5	43
L.A. Abrasion % max.	40	40
Soft Particle % max.	8	6

B. GRADATIONS - Percent passing indicated sieve:		
1"	100	100
3/4"	100	100
1/2"	75-95	100
3/8"	60-90	92-100
#4	45-80	65-90
#8	30-65	55-75

#16	20-50	--
#30	15-40	25-45
#50	10-25	--
#100	5-15	--
#200	3-6	3-7
Crush (min.) MTM 117	60*	60

* Modified from MDOT specifications.
**Aggregate shall be 100 percent crushed limestone.

C. Final binder properties shall meet asphalt PG 58-28 for this project.

D. If the binder obtained from the RAP exceeds 17 percent of the total binder in the mixture, the contractor shall furnish documentation (i.e., blending chart) in order to determine the proper grade of the virgin binder required to achieve the desired final binder properties. No asphalt binder, or aggregates, derived from roofing shingles shall be introduced into any mixtures placed under this contract.
The contractor will provide to the engineer asphalt delivery tickets showing asphalt cement (binder) grade, date of delivery, and quantity delivered. The contractor will provide a letter to the owner certifying that all materials approved on the mixture design were, in fact, used for the project.

2. In-Place Density

The average in-place density of the mixture shall be a minimum of 95 percent of theoretical maximum density.

ITEM SPECIAL - FULL DEPTH, CHEMICAL STABILIZED BASE COURSE (Single Cut Process)

QUALITY CONTROL

Quality control observation and material testing services should be provided by an independent testing agency that can demonstrate past experience in the completion of Full Depth Reclamation/Stabilization. The prior experience should include FDR mix designs and field testing. The independent testing agency should submit the project name, location, completion date, and contact information of (ten) similar projects to the Project Engineer to verify compliance with the experience qualifications, upon request.

The independent testing agency should employ at least one engineer registered in the state in which the work is being completed.

A representative of the independent testing agency should be on-site each day that additives are blended with pre-pulverized material. The costs for such monitoring and testing shall be paid by the contractor. The testing agency's duties should include, but not be limited to:

1. Verification that specified reclamation depths are achieved and are consistent

throughout the pavement cross section per project plans.

2. Verification that the composition of the encountered material is consistent with the basis for the mix design.

3. Verification that the specified application rates for additives are being achieved.

4. Compaction testing using a nuclear density meter, or other approved equipment
to verify compliance with the project specifications.

5. Preparation of field specimens, at least four per material type for each day during which pulverized materials are blended with additives. The specimens should be prepared using standard Proctor methods.

6. Test specimens for compressive strength in general accordance with ASTM Dl633 after a cure period similar to that of the stabilized mat.

7. Preparation of a final report indicating the daily field activities as well as the results of strength testing of the field prepared specimens. A copy of the report to be provided to the Project Engineer.

Example of qualified testing firm is; C.C.T. of Waterville, OH (419) 878-7304

1. DESCRIPTION

This work shall consist of pulverizing the existing granular base along with the underlying sub-grade material to the specified length, width, and depth, upgrading with cement then placing, compacting and moist curing the base as shown on the plans and as provided herein to create an “In-Place” Stabilized Base Course (SBC). Specific questions regarding this process may be directed to Mitch Forst at C.C.T., Inc. (419) 878-7304

2. MATERIALS

(2.1) PULVERIZED BASE MATERIAL.

Pulverized Base Material shall consist of the material existing in the area to be stabilized to a depth of twelve (12) inches. According to sub-surface investigation, said material will consist of 5” to 7” aggregate base material and with the remaining material assumed to be ASTM “CL”/AASHTO A-6 and A-7-6 classified sub-grade material. For the sake of calculating quantities, the maximum dry density of this material is ~ 124 lb./c.f..

(2.2) CHEMICAL STABILIZER

Type 1 Portland cement (ASTM C 150-95) has been approved as the stabilizer for this project. The MSDS and typical composition for this material follows these specs. The amount of Portland cement used shall be 4.0% of the maximum dry density of the pulverized material based on a 12" depth of cut which equals 44.5 lbs./S.Y..

(2.3) WATER

Water shall be clean and clear. If the water is of questionable quality, it should be tested in accordance with the requirements of AASHTO T26.

3. MIXTURE

Combine the pulverized materials, Portland cement and water, meeting the Requirements specified herein, in such proportions that they conform to the Design accepted by the Engineer. Make field adjustments to the mix proportions under the guidance of the Engineer to obtain a satisfactory Stabilized Base Course (SBC).

4. CONSTRUCTION

(4.1) GENERAL.

The contractor shall provide all necessary labor, equipment, Portland cement, water, and bituminous material (if used for cure) required to pulverize, mix, place, compact, finish, and cure the Stabilized Base Course. All materials, testing, design, certification, and provisions as specified herein shall apply.

(4.2) EQUIPMENT.

The equipment for pulverizing and mixing the existing pavement surfaces shall be a self-propelled road reclaimer/soil stabilizer capable of pulverizing, "In-Place", the existing pavement, base and sub-grade at a minimum width of eight(8) feet, and mixing any added materials to the specified depth of Twelve (12) inches. The cutting drum shall have the ability to operate at various speeds(RPM), independent of the machine's forward speed, in order to control chunk size and gradation.

The machine shall be capable of pushing a water supply tanker or distributor and shall be equipped with a computerized integral liquid proportioning system capable of regulating and monitoring the water application rate relative to depth of cut, width of cut, and speed. The water pump on the machine shall be connected by a hose to the supply tanker/distributor, and shall be mechanically or electronically interlocked with the forward movement/ground speed of the machine. The spray bar shall be mounted in such a manner as to allow the water to be injected directly into the cutting drum/mixing chamber. Only under special circumstances will the Engineer consider allowing the water to be sprayed directly onto the cut/un-cut pavement ahead of or behind the pulverizer/mixer by a distributor or other means. The equipment shall be capable of mixing water, dry additives, and the pulverized pavement into a

homogenous mixture. The cutting drum shall be fully maintained and in good condition at all times throughout the job.

(4.3) METHODS.

(A) GRADE PREPERATION

Before the stabilization treatment can begin the areas to be treated shall be brought to the desired grades allowing for some swelling of the material. This item is not included as part of the stabilization.

b. PORTLAND CEMENT APPLICATION and MIXING

Upon completion of the grade preparation, the Portland cement specified for this job shall be accurately and uniformly spread over the area by a bulk distributor at the specified application rate. Extreme care should be taken to minimize dust, scattering and material loss by wind.

Manual and gravity (tail gate) spreading of the additives is unacceptable.

In the event that accuracy, uniformity or dust, in the opinion of the engineer becomes a problem, said spreading operation shall be ceased until an agreeable method can be secured.

No Portland cement shall be spread when the soil or sub-grade is frozen or when the air temperature is less than 40 deg F in the shade.

Once the Portland cement is spread, it shall be mixed at a depth of 12", or as directed, to create a homogenous stabilized base course.

The percentage of moisture in the pulverized material, at the time of Portland cement application, shall be the amount that assures a uniform and intimate mixture of pulverized material and Portland cement during mixing operations.

The operations of Portland cement application, water application, mixing, spreading, compacting, and finishing shall be continuous. The mixing, grading, and final compaction should be completed within a time frame appropriate for the additive applications and required strengths. If mixing operations are interrupted, the surface should be sealed to protect the material.

c. COMPACTION.

The number, weight and type of rollers shall be sufficient to obtain the required compaction while the SBC is in a workable condition. As a minimum requirement, breakdown compaction shall be performed with a large single drum **vibratory pad-foot compactor w/blade**. Said roller shall be capable of applying 52,000 lbs. of centrifugal force minimum

Compaction of the mixture should proceed immediately after mixing, in such a manner to provide uniformity and continuous compaction of the treated layer. At the start of compaction, the percentage of moisture in the mixture

and in un-pulverized soil lumps shall not be below or more than two percentage points above the specified optimum moisture content, and shall be less than that quantity which will cause the stabilized base course mixture to become unstable during compaction and finishing.

The target density of the compacted stabilized mixture is 98% of the Standard Dry density as determined by AASHTO T-99. If during compaction operations depressions, defective areas, or soft spots develop, they should be corrected immediately by additional pulverization/aeration alone, or by the addition and mixing of additional stabilizer. After each section is completed, field density tests will be performed in accordance with AASHTO T-191, AASHTO T-205, or AASHTO T-238. If the compacted mixture fails to meet the specified density requirements, the Engineer may require it to be re-worked as necessary to meet those requirements. They may require the contractor to change his compaction methods to obtain the required density on the next section(s).

(D) STABILIZED BASE COURSE PLACEMENT/GRADING/FINISHING.

The SBC shall be placed by means of a conventional motor grader with automatic slope control, to the lines and grades established in the plans or proposal. Paving of this type is expected to be in accordance with acceptable base course products with a tolerance of not more than .05' of irregularity.

Throughout the entire operation, the shape of the base course should be maintained.

When initial compaction is nearing completion, the surface of the stabilized base course shall be shaped to the required lines, grades, and cross section. The moisture content of the surface material shall be maintained at not less than its specified optimum moisture content during finishing operations.

Compaction and finishing shall be done in such a manner as to produce a smooth, dense surface free of compaction planes, cracks, ridges, or loose material.

(E) CURING

After the stabilized base course has been finished as specified, it should be protected against drying for 24 hours. The surface should be maintained to a moist condition by sprinkling with water for the above mentioned time period. Heavy traffic or equipment other than curing equipment will not be allowed on the finished roadway until completion of curing, unless permitted by the Engineer.

Other methods of curing, such as a bituminous sealant, is approved by the Engineer. The costs associated with this shall be included in the lump sum price.

(4.3) WEATHER LIMITATIONS.

No work shall be performed before April 15th or after October 15th. The weather and temperature limitations for this work shall be 50 deg. F and rising with no standing water on the existing surface. No work shall be performed if there is a forecast of an atmospheric temperature below 32 deg. F within 24 hours from the time the SBC is completed. All work shall be completed and open to local traffic during daylight hours.

5. MAINTENANCE OF TRAFFIC

Traffic maintenance shall be performed per local specifications protecting the uncompacted material from traffic. Enough flag people/signs for incoming roads shall be used until product is compacted properly.

XI. FIVE-YEAR WARRANTY

It is the intent of this document to provide the owner with a five-year warranty against defects caused by deficiencies in the materials and/or workmanship provided on this project. The warranty covers the following conditions:

1. Cracking as defined shall be any crack caused by improper joints in the pavement, either a construction joint, a butt joint, or any cracking caused by expansion or contraction of the pavement, i.e., thermal cracking. Cracks caused by fatigue or settlement will not be covered by this warranty.

2. Delaminating as defined shall be any instance where the surface course de-bonds from the underlying layer of asphalt pavement, causing slippage or complete separation.

3. Raveling as defined shall be any area where the aggregate or matrix becomes loose, or separates from the asphalt pavement. This condition will generally be caused by poor density or segregation.

Remedies for the conditions described above will be as follows:

1. Cracking. Any cracks over 3’ in length and/or wider than 1/8” shall be corrected by routing/sawing and sealing or overband sealing, as directed by the engineer, with a sealer approved by the engineer.

2. Delaminating. Any area that exhibits delaminating will be repaired by removing the surface course and cleaning the leveling course, installing a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

3. Raveling. Any area that exhibits raveling, or a loss of aggregate or matrix, will be repaired by removing the distressed area, cleaning the leveling course, applying a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

At least once a year, for the duration of the warranty period, the owner will inspect the pavement to determine if any warranty work is necessary. If deficiencies are found, the owner will notify the contractor in writing as to the extent of the repairs needed. The contractor may also inspect the lot from time to time to determine if any warranty work is necessary. The contractor will be allowed to perform any warranty work that he feels will retard any further deterioration of any of the warranted conditions.

XII. PAYMENT

Payment For This Work Will Be By Lump Sum. The unit prices below are for comparison of bids and informational purposes. Bids will include all work shown on the drawings, including removing the asphalt pavement; chemical stabilization, removing from the site all excess materials; fine grading and compacting the aggregate base; and placing and compacting the four and one-half inches of hot mix asphalt pavement etc.

Hudson Community Schools

Reconstruct Lots & Drives
Lincoln Elementary

Item	Unit	Amount	Unit Price	Total
Cold Milling	SYD	6030		
Subgrade Undercut – Type 2	CYD	150		
Aggregate Base	TON	300		
Chemical Stabilization	SYD	6030		
4" Concrete Sidewalk	SFT	360		
Unclassified Earth Excavation	CYD	350		
4" Underdrains	LFT	1200		
Bituminous Mix 13A Modified	TON	1040		
Bituminous Mix 36A Modified	TON	520		
Pavement Marking	LS	1		
Traffic Control	LS	1		
Mobilization	LS	1		
Total				

Signed by_____

Contractor_____

Address_____

City_____ State_____ Zip_____

Dated_____

Note: Quantities shown above are engineering estimates only. Bidders shall base the lump sum proposal on their own take-offs using the drawings.

ATTACHMENT #1

City of Hudson – Storm Sewer Items

ITEM#	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
2030011	Dr.Structure, Rem	Ea	1		
2030015	Sewer, Rem, Less than 24 in	Ft	117		
4020004	Sewer, CIA, 12 in, Tr Det A	Ft	457		
4030010	Dr. Structure Cover, Type B	Ea	1		
4030035	Dr. Structure Cover, Type E	Ea	1		
4030040	Dr. Structure Cover, Type G	Ea	1		
4030200	Dr. Structure, 24 inch dia	Ea	3		
4030304	Dr. Structure, Tap, 4 inch	Ea	1		
4030312	Dr. Structure, Tap, 12 inch	Ea	2		

2012 ARCHITECTURAL & ELECTRICAL
HUDSON AREA SCHOOLS

SECTION 02520

HIGH SCHOOL/MIDDLE SCHOOL PARKING LOTS & DRIVES

SCOPE OF WORK AND SPECIFICATIONS

Request for a proposal to reconstruct the existing parking lot and drives. The undersigned bidder has examined the specifications and the location of the work described in the proposal for this project and is fully informed as to the nature of the work and the conditions at the existing site.

The bidder hereby proposes to furnish all necessary machinery, tools, apparatus and other means of construction; do all the work; furnish all the materials except as otherwise specified; and, for the lump-sum and/or unit prices indicated, to complete the work in strict accordance with the specifications included in this proposal and in strict conformity with the requirements of the current Standard Specifications for Construction, Michigan Department of Transportation, and such other special provisions, and other specifications as included in this proposal.

The successful bidder must provide any and all permits that may be required by the State of Michigan, The City of Hudson, Lenawee County, or any other controlling agency or entity.

The undersigned further proposes to do such extra work as may be authorized by the owner. Compensation shall be made on the basis agreed upon before such extra work is begun.

I. SCOPE OF WORK

It is the intent of this project to pulverize (Crush & Shape) the existing asphalt parking lots and drives. The pavement, which averages approximately 2.75 inches in thickness, including up to 4.5 inches of the underlying aggregate base, shall be uniformly crushed. Ninety-five percent of the crushed material must have a maximum particle size of 1.5 inches, with no particle size exceeding 4 inches. The crushed material, at a moisture content not greater than optimum, shall be compacted to not less than ninety-eight percent of its maximum unit weight. This item shall include scarifying, crushing, grading, shaping, rolling and compacting the existing HMA. Any water needed to obtain the required density shall be incidental to this item. Any aggregate base required to supplement or bolster the existing aggregate shall be MDOT 21AA and shall be furnished, installed and paid for by the ton. Once the above work is completed, the contractor will proof roll the new base with a loaded truck, which meets the approval of the engineer, to determine if there are any soft or unstable areas. If any of these conditions are encountered, the contractor will do subgrade undercutting Type II as indicated by the engineer.

If determined necessary by the Engineer, four-inch perforated, geotextile wrapped, underdrains shall be installed as directed, and connected to the existing drainage structures. The actual placement of these underdrains will be determined in the field, by the engineer, and the costs associated with tapping into these structures shall be incidental to the under drain pay item. The new bus parking area and the

new exit driveway, which are bid as alternated 200-9 and 200-11 shall be excavated and expanded as shown and spoils from the pulverized asphalt process may be utilized as base in the excavated area. Additional sub-base material shall meet the specification for MDOT Class II. 8 Inches of new aggregate base shall be furnished and compacted, and shall meet the specification for MDOT 21AA. Any excess material generated by this process and unable to be utilized in this project shall be removed from the site and properly disposed. Throughout the duration of this project, the contractor shall have available a water truck, capable of sprinkling the grade, and maintaining the moisture content of the aggregate base to within two percent on either side of the optimum moisture content. The costs associated with this shall be included in the lump sum price. Once the preceding work has been completed the contractor shall proof roll the existing base with a loaded truck, which meets the approval of the engineer, to determine if there are any soft or unstable areas. If any of these conditions are encountered, the contractor will do subgrade undercutting, type II as indicated by the engineer. In these undercut areas, drainable fill shall be used up to the bottom of the existing aggregate base. Aggregate base required to complete the undercut areas shall be acceptable to the engineer. This item shall be included by the cubic yard. Any additional aggregate required to bolster the existing base shall be paid for by the ton.

Four new 2-foot catch basins, including frames and grates, will be furnished, installed, and connected as directed to the existing sub-surface drainage system. Costs associated with tapping into the existing system shall be included in the lump sum price.

Once the preceding work has been completed, asphalt pavement will be placed. The new asphalt pavement shall consist, in the heavy duty/bus aress, of three inches of 13A Modified base course, followed by 1-1/2 inches of 36A Modified surface. In the standard duty areas the new asphalt pavement shall consist of two inches of 13A Modified base course, followed by 1-1/2 inches of 36A Modified surface course. The technical specifications for these mixes are outlined below.

Alternate 200-3 is the Replacement of the School Board Offices Parking Lot and Drive. Specifications will follow the protocols for the standard duty section outlined above.

Minimum traffic control shall provide for safe ingress and egress, and protection of employees, students and local residents from the construction operation. A traffic control plan provided by the contractor shall be approved by the engineer.

All materials not incorporated into the work will be removed from the site; any areas that are disturbed by the construction will be repaired to a “like” condition. Cost Associated with this work shall be included in the lump sum price.

Contractor is responsible for all utility marking, layout, and grade staking.

The successful bidder shall furnish separate performance and payment bonds, each with limits of 100 percent of the contract sum. Bonds shall be co-oblige bonds naming both the owner and Dailey Engineering, Inc. as principals. Bonds shall be secured from bond organizations licensed to underwrite within the State of

Michigan, and both form and substance shall be subject to the review and approval of the owner and Dailey Engineering, Inc.

Prior to determination of bonding, and therefore, award, the successful bidder shall be prepared to provide evidence of experience and financial stability as may be requested by the owner or Dailey Engineering, Inc., including audited financial statements.

II. TERMINOLOGY

Quality Control (QC) - All activities that have to do with making the quality of a product according to specifications, including training, materials sampling and testing, project oversight, and documentation.

Quality Assurance (QA) - All activities that have to do with making the quality of a product according to specifications including materials sampling and testing, construction inspection, and review of contractor quality control documentation.

Bituminous Mix Design - The selection and proportioning of aggregate(s), mineral filler (if required), reclaimed asphalt pavement (RAP) and asphalt binder such that the specified mixture design criteria are met. Laboratory evaluation is required to determine if the stated mix design complies with specifications.

Job Mix Formula (JMF) - A bituminous mixture for a specific project. This may include adjustments to the mix design to optimize the field application.

Target Value - A JMF parameter value that may be adjusted, if approved by the engineer, to account for changes in the physical properties of the mixture.

JMF Adjustment - The contractor may propose an adjustment to the JMF based upon QC and/or QA test results. The proposed JMF must meet the requirements of the 2003 Standard Specifications for Construction. When approved by the engineer, a JMF adjustment may be applied retroactively to one lot, for parameters with target values.

Voids in Mineral Aggregate (VMA) - The volume of void space between the aggregate particles of a compacted paving mixture that includes the air voids and the asphalt binder, including the absorbed asphalt binder, expressed as a percent of the total volume of mixture.

Effective Specific Gravity (Gse) - The ratio of the oven dry weight in air of a unit volume of an aggregate (excluding voids permeable to asphalt) at a stated temperature to the weight of an equal volume of water at a stated temperature.

Bulk Specific Gravity of Aggregate (Gsb) - The ratio of the oven dry weight in air of a unit volume of an aggregate at a stated temperature to the weight of an equal volume of water at a stated temperature.

Maximum Specific Gravity of Mixture (Gmm) - The ratio of the weight in air of a unit volume of an uncompacted bituminous paving mixture at a stated temperature to the weight of an equal volume of water at the same temperature.

Lot - Bituminous mixture produced and placed under this special provision is evaluated on a lot-by-lot basis. A lot is made up of a discrete tonnage of one mixture. Each lot is made up of three sublots. These sublots will be of approximately equal size up to a maximum of 2000 tons. The sublot size shall be approved by the engineer prior to the start of production. The contractor may request a change in the sublot size during production based upon the contractor's ability to produce a mixture that meets the specification contained within the contract documents, and upon approval of the engineer.

If only one or two sublots are included in a lot at the end of production, they will be combined with the previous lot using the same mix, and this combined lot will be evaluated based upon all sublot samples.

Lot Average Test Result - The average of all sublot QA test results, for a specific parameter, for the lot. Test results for any sublot removed from the project will not be used in calculating a lot average. However, the replacement material will be tested and the results included in the lot average.

Process Quality Control Targets - These targets are established by the contractor based upon initial production lot test results (and from any approved trial run) for air voids, VMA, asphalt binder content and Gmm. QC tolerances will be applied to these established targets to determine the need for production changes, including stopping production, to control the quality of the product. Process quality control targets must be reported to the engineer prior to the end of placement of the second lot.

Rounding of Numbers - Rounding of numerical data will follow ASTM E 29-93a, as described in the MDOT Bituminous QC/QA Procedures Manual of Field Testing.

Random Sampling - Selection of QA samples (bituminous mixture and density) and verification samples will be by a random process managed by the engineer. The contractor will be given the opportunity to observe the sampling process. However, the random numbers selected and the sampling locations will not be revealed to the contractor until the time of sampling in order to avoid bias in the random sampling process.

III. SAMPLING AND TESTING

The following sampling and testing procedures are to be followed in completing this work.

ASTM D 1559-89 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (Section 4.5).

ASTM D 2172 Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

ASTM D 2041 Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

ASTM D 2726 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.

ASTM C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates.

ASTM C 117 Test Method for Materials Finer Than 75-µm (no. 200) Sieve in Mineral Aggregates by Washing.

ASTM E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

MTM (Michigan Test Method) 311 Determining Aggregate Gradation for Bituminous Mixture.

MTM 117 Determining Percentage of Crushed Particles in Aggregates.

MTM 118 Measuring Fine Aggregate Angularity.

MTM 110 Determining Deleterious and Objectionable Particles in Aggregates.

MTM 319 Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method.

MTM 313 Sampling Bituminous Mixtures.

Equipment. All equipment requirements to perform these sampling and testing procedures shall apply.

IV. QUALITY CONTROL (CONTRACTOR)

a. Bituminous Mixture: The contractor will take random samples of loose mixture at least every 400 tons of mixture, or a sampling frequency agreed upon with the engineer. The engineer will be provided a split sample of all QC samples taken by the contractor. This sample may be taken anywhere in the production process, except behind the paver. The contractor will be responsible for establishing process quality control targets for air voids, asphalt binder content, aggregate gradation, Gmm, obtaining QC samples, and conducting QC testing in accordance with the contractor's quality control plan (QCP).

Each QC sample shall be identified to allow all test reports to be linked to a specific lot or sublot within the project.

The contractor shall maintain daily control charts and have them available for review at the plant at all times. Copies of these control charts shall be provided to the engineer if requested. All test results shall be plotted and used in quality control decisions. When corrective action is necessary, the contractor shall notify the engineer in writing of the specific action taken, if it required a JMF adjustment.

b. In-place Density: The contractor will have a density gage available for quality control testing during the compaction process. The contractor will also have the capability to take 6" cores from random locations throughout the paved area for

acceptance testing. The contractor may take up to three informational cores from each mixture type, to help correlate the density gage. Minimum in-place density shall average 95 percent of theoretical maximum density, Gmm.

V. QUALITY ASSURANCE (ENGINEER)

a. Bituminous Mixture: The engineer may collect bituminous mixture (loose) quality assurance samples and provide the contractor with splits of these samples. If the criteria for the verification procedure are satisfied, the contractor's test results may be incorporated into the acceptance and payment decisions for the mixture. During the course of production, the engineer may acquire random samples at any point in the production process. These samples may be tested to determine if the mixture, the aggregate and the binder meet all of the specification requirements contained in the contract document. As the samples are collected, the engineer may assign an alphanumeric identifier to the sample and split, which can be used to trace the test results to the lot and sublot. This alphanumeric identifier may be included on all engineer test reports associated with that sample. An example is 4-2-A, which might designate the engineer's split (A) of the sample from sublot 2 of lot 4 on a project.

A minimum 16,000 gram sample may be taken. The sample will be divided equally for contractor and engineer testing. The following tests may be conducted by the engineer on the QA sample splits.

1. Maximum Specific Gravity, Gmm (ASTM D 2041)

2. Bulk Compacted Density (ASTM D 1559, paragraph 4.5)
3. Air Voids (calculated)

4. Voids in Mineral Aggregate, VMA (calculated)

5. Composition of the Mixture - Asphalt binder content based on calculated value using sublot maximum specific gravity (Gmm) and current JMF effective specific gravity (Gse). The retained Gmm sample may be used for gradation (ASTM C 136, C 117) and crushed particle content (MTM 117) from extracted (ASTM D 2172) or incinerated (MTM 319) aggregate, or from MTM 311.

b. In-Place Density: The engineer may identify random core sample locations for each sublot based on longitudinal and transverse measurements. The engineer will mark each core location with a paint dot, which represents the center of the core. The contractor shall drill a 6" core sample at each core location. The contractor shall notify the engineer sufficiently in advance of coring to ensure that a representative can be present to witness the coring and take possession of the core. The core density shall be calculated using the TMD from the test data obtained from that day's sample. The core samples shall be taken after final rolling.

As an option, when mutually agreed to by the engineer and contractor, the core samples may be waived and the density gage will be used for acceptance testing.

Core samples shall not be damaged during removal from the pavement. If, for any reason, a core is damaged or determined not to be representative at the time of coring, the engineer will evaluate and document the problem and determine if re-coring is necessary.

All previous pavement, base aggregate or bond coat material shall be sawed off the bottom of the core samples.

The core holes shall be filled with hot mixture and thoroughly compacted as part of the coring operation. The method of filling holes and obtaining compaction shall be agreed upon prior to production. Pavement density acceptance testing will be completed within one (1) work day after the cores were taken. Testing will be in accordance with ASTM D 2726. The test results on the compacted bituminous mixture will be used as a basis of acceptance and payment.

VI. VERIFICATION OF QUALITY CONTROL TEST

a. General Procedure: The engineer will review the contractor's sampling and testing procedures, their test results and any engineer quality assurance test results. If, in the opinion of the engineer, sampling and testing procedures are proper, the contractor's quality control test data may be used for acceptance decisions.

The contractor's QC test results may be considered verified if the following criteria are satisfied:

1. The difference between the contractor's QC test results and the JMF fall within the single test tolerance shown in Table 1, or
2. The difference between the engineer's test results and the contractor's test results fall within the single test tolerance shown in Table 1.

If the difference between the contractor's QC test results, compared to the JMF, exceed the single test tolerances shown in Table 1, the engineer's test results will be used as the acceptance test. If the sublot is not verified, the contractor shall be notified and given a copy of the test results. Both the contractor and the engineer will verify that testing equipment is calibrated and operating properly, and correct testing procedures have been followed. Unless it is documented that the difference resulted from equipment or procedural problems, the engineer's test results will remain as the acceptance test of record.

The cost of one verification test per mixture type shall be paid by the owner. Any additional mixture verification testing for acceptance shall be paid for by the contractor.

VII. PROJECT DOCUMENTATION

a. General: The format of all test reports and quality control charts to be submitted by the contractor will be approved by the engineer before mixture production is allowed to commence. Suggested formats of reports and charts are available from the engineer. Project documentation to be provided by the contractor shall include, but may not be limited to, the following.

b. Lot Basis:

1. A complete report of QC tests shall be submitted to the engineer within 24 hours of the time the last tests were completed.
2. Control charts of all test data must be current (data should be plotted as soon as the test is complete) and available for review by the engineer.

c. Project Summation:

1. Control charts for all test data indicating individual test values, lot averages and the running average of five.
2. A tabulation of all test data including sublot data, lot averages, project average, project standard deviation and a projection of which lots are subject to a price adjustment.

VIII. MEASUREMENT AND PAYMENT

Bituminous Mixture Price Adjustment

a. General: Adjustments to the contract unit price for bituminous mixture will be calculated for each of four sets of criteria. The largest adjustment allowable in each case will be imposed and unit price adjustments will be applied cumulatively (lot pavement density + pavement density + bituminous mixture + failure to suspend operations) to the affected tonnage. Each of the unit price adjustments is detailed below.

b. Bituminous Mixture: If, for asphalt binder content, air voids, Gmm or VMA, the difference between the lot average and the JMF is within the lot average tolerance shown in Table 2, no adjustment will be made to the unit price for **Bituminous Mixture** under this criteria. If the lot average tolerance is exceeded for one or more parameter(s), a negative adjustment will be made to the contract unit price for **Bituminous Mixture** in accordance with Table 2. Only the largest of the four possible pay adjustments for this set of criteria will be assessed. This price adjustment is applied to the entire lot tonnage.

c. Pavement Density: Based on pavement cores or the density gage, either a 10 percent or a 25 percent adjustment in the **Bituminous Mixture** contract unit price may be imposed. The following criteria will be used and only the highest calculated pavement density price adjustment will be applied. This price adjustment is applied to the entire lot tonnage.

1. A negative 10 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 95.0 percent, but equal to, or greater than, 94.0 percent.
2. A negative 25 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 94.0 percent, but equal to, or greater than, 92.0 percent.

IX. REMOVAL

a. General: The cost of the mixture removed and the removal cost will be borne by the contractor. Removal decisions will be applied to individual sublots.

b. If the pavement density for any sublot (average of sublot cores) is less than 92.0 percent, the contractor shall remove and replace the sublot.

c. The engineer reserves the right to evaluate any sublot whose test results for asphalt binder content, Gmm, VMA, or air voids, exceed the single test tolerances shown in Table 1. If the engineer determines that the in-place mixture will not perform in accordance with normal standards, the contractor shall remove and replace the sublot.

TABLE 1 : Bituminous Quality Assurance Testing Tolerances (+ or -) from JMF

Parameter	Single Test	Lot Average
Air Voids	1.00%	0.60%
Voids in Mineral Aggregate (VMA)*	1.20%	0.75%**
Maximum Specific Gravity (G_{mm})*	0.019	0.012
Asphalt Binder Content*	0.50%	0.35%

*Parameters with Target Values
**Or less, determined by VMA Value from the 2003 Standard Specifications for Construction.
The engineer retains the authority to make necessary adjustments to the JMF to ensure compliance with the intent of the specifications.

TABLE 2: Bituminous Mixture Pay Adjustments

Parameter (lot average)	Deviation (d)	Negative Unit Price Adjustment (%)
Asphalt Binder Content (deviation from JMF)	$0.35 < d \leq 0.55$	10
	$d > 0.55$	25
Air Voids (deviation from JMF)	$0.6 < d \leq 0.7$	2
	$0.7 < d \leq 0.8$	4
	$0.8 < d \leq 1.0$	6
	$1.0 < d \leq 1.1$	8
	$1.1 < d \leq 1.2$	10
	$d > 1.2$	25
Maximum Specific Gravity (G_{mm}) (deviation from JMF)	$0.012 < d \leq 0.014$	2
	$0.014 < d \leq 0.015$	4
	$0.015 < d \leq 0.017$	6
	$0.017 < d \leq 0.019$	8
	$0.019 < d \leq 0.021$	10
	$d > 0.021$	25
Voids in Mineral Aggregate (VMA) (deviation below minimum value in the 2003 Standard Specifications for Construction)	$0.0 < d \leq 0.1$	2
	$0.1 < d \leq 0.3$	4
	$0.3 < d \leq 0.4$	6
	$0.4 < d \leq 0.5$	8
	$0.5 < d \leq 0.6$	10
	$d > 0.6$	25

X. TECHNICAL SPECIFICATIONS

Section 304. Bituminous Mixtures

304.01 Description. Construct the bituminous leveling and surface courses.

The contractor will furnish all necessary machinery, tools, apparatus and other means of construction to do all the work, and furnish all the materials, except as otherwise specified, to complete the work in strict accordance with the plans and specifications included in this proposal, and in strict compliance with the 2003 Michigan Department of Transportation Standard Specifications for Construction and special provisions.

304.02 Technical Specifications

1. Mix Design

A 4 point, fifty blow each side, Marshall Mix Design will be completed for each mixture used on this project. This design will be done in accordance with the Asphalt Institutes MS-2 with the following clarifications. Two theoretical density (G_{mm}) tests will be conducted for each of the four test points, without dry back. The effective specific gravity (G_{se}) will then be calculated for each test point using the average $G_{mm,}$ and then the mixture G_{se} will be the average of the four test points. The completed mixture design will include all data from all test points and a regression table showing the following data for each 0.1% asphalt content; air voids, maximum theoretical specific gravity, compacted density, and voids in the mineral aggregate. This data, in its entirety, must be presented to and approved by the owner's representative at least two days before the mixture is placed.
It is the intent of this specification for the contractor to produce mixture at the following parameters. If the engineer believes the contractor is producing mixture at the high end or low end of any of these specification limits, the engineer shall have the authority to make any changes he feels necessary to bring the mixture back to the specified parameters.

A. MIXTURE NUMBER:	13A Mod.	36A Mod
VMA % (eff. spec. gravity)	15.5	16.5
Air voids %*	2.5*	2.5
Fines to binder ratio (max.)	1.2	1.2
Fine angularity min.MTM 118	2.5	43
L.A. Abrasion % max.	40	40
Soft Particle % max.	8	6

B. GRADATIONS - Percent passing indicated sieve:		
1"	100	100
3/4"	100	100
1/2"	75-95	100
3/8"	60-90	92-100
#4	45-80	65-90
#8	30-65	55-75

#16	20-50	--
#30	15-40	25-45
#50	10-25	--
#100	5-15	--
#200	3-6	3-7
Crush (min.) MTM 117	60*	60

* Modified from MDOT specifications.
**Aggregate shall be 100 percent crushed limestone.

C. Final binder properties shall meet asphalt PG 58-28 for this project.

D. If the binder obtained from the RAP exceeds 17 percent of the total binder in the mixture, the contractor shall furnish documentation (i.e., blending chart) in order to determine the proper grade of the virgin binder required to achieve the desired final binder properties. No asphalt binder, or aggregates, derived from roofing shingles shall be introduced into any mixtures placed under this contract.
The contractor will provide to the engineer asphalt delivery tickets showing asphalt cement (binder) grade, date of delivery, and quantity delivered. The contractor will provide a letter to the owner certifying that all materials approved on the mixture design were, in fact, used for the project.

2. In-Place Density

The average in-place density of the mixture shall be a minimum of 95 percent of theoretical maximum density.

XI. FIVE-YEAR WARRANTY

It is the intent of this document to provide the owner with a five-year warranty against defects caused by deficiencies in the materials and/or workmanship provided on this project. The warranty covers the following conditions:

1. Cracking as defined shall be any crack caused by improper joints in the pavement, either a construction joint, a butt joint, or any cracking caused by expansion or contraction of the pavement, i.e., thermal cracking. Cracks caused by fatigue or settlement will not be covered by this warranty.

2. Delaminating as defined shall be any instance where the surface course de-bonds from the underlying layer of asphalt pavement, causing slippage or complete separation.

3. Raveling as defined shall be any area where the aggregate or matrix becomes loose, or separates from the asphalt pavement. This condition will generally be caused by poor density or segregation.

Remedies for the conditions described above will be as follows:

1. Cracking. Any cracks over 3’ in length and/or wider than 1/8” shall be corrected by routing/sawing and sealing or overband sealing, as directed

by the engineer, with a sealer approved by the engineer.

2. Delaminating. Any area that exhibits delaminating will be repaired by removing the surface course and cleaning the leveling course, installing a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

3. Raveling. Any area that exhibits raveling, or a loss of aggregate or matrix, will be repaired by removing the distressed area, cleaning the leveling course, applying a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

At least once a year, for the duration of the warranty period, the owner will inspect the pavement to determine if any warranty work is necessary. If deficiencies are found, the owner will notify the contractor in writing as to the extent of the repairs needed. The contractor may also inspect the lot from time to time to determine if any warranty work is necessary. The contractor will be allowed to perform any warranty work that he feels will retard any further deterioration of any of the warranted conditions.

XII. PAYMENT

Payment For This Work Will Be By Lump Sum. These unit prices are for comparison of bids and informational purposes. Bids will include all work shown on the drawings, including pulverizing the asphalt pavement; removing from the site all excess materials; fine grading and compacting the aggregate base; and placing and compacting the hot mix asphalt pavement etc.

Reconstruct Lots & Drives
High School/Middle School

Item	Unit	Amount	Unit Price	Total
Crush & Shape	SYD	24100		
Subgrade Undercut – Type 2	CYD	300		
Aggregate Base	TON	2390		
Earth Excavation	CYD	2500		
New Drainage Structures	EA	4		
6” Schedule 40 PVC	LFT	500		
4” Underdrains	LFT	1200		
Bituminous Mix 13A Modified	TON	3700		
Bituminous Mix 36A Modified	TON	2280		
Pavement Marking	LS	1		
Traffic Control	LS	1		
Mobilization	LS	1		
Total				

Alt 200-3	Lump Sum Total
Replace Board Office Lot and Drive	
Alt 200-9	Lump Sum Total
New Bus Parking	
Alt 200-11	Lump Sum Total
New Exit Driveway	

Signed by_____

Contractor_____

Address_____

City_____ State_____ Zip_____

Dated_____

Note: Quantities shown above are engineering estimates only. Bidders shall base the lump sum proposal on their own take-offs using the drawings.

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 02530

HIGH SCHOOL/MIDDLE SCHOOL TRACK

SCOPE OF WORK AND SPECIFICATIONS

Request for a proposal to reconstruct the existing running track and field events. The undersigned bidder has examined the specifications and the location of the work described in the proposal for this project and is fully informed as to the nature of the work and the conditions at the existing site.

The bidder hereby proposes to furnish all necessary machinery, tools, apparatus and other means of construction; do all the work; furnish all the materials except as otherwise specified; and, for the lump-sum and/or unit prices indicated, to complete the work in strict accordance with the specifications included in this proposal and in strict conformity with the requirements of the current Standard Specifications for Construction, Michigan Department of Transportation, and such other special provisions, and other specifications as included in this proposal.

The successful bidder must provide any and all permits that may be required by the State of Michigan, The City of Hudson, Lenawee County, or any other controlling agency or entity.

The undersigned further proposes to do such extra work as may be authorized by the owner. Compensation shall be made on the basis agreed upon before such extra work is begun.

I. SCOPE OF WORK

It is the intent of this project to provide the owner with a rehabilitated running track that meets all requirements for a 6-lane, 400 meter latex track. All layout, line and grade required to accomplish this shall be included in this contract. For the Base Bid: The contractor shall remove the existing synthetic running surface from the asphalt pavement and from the existing high jump area. After the surface is removed, the existing asphalt pavement shall be evaluated by the owner, and the engineer. If the asphalt is determined to be suitable, the existing cracks shall be treated with hot-pour rubber crack filler, and the track resurfaced with one and one-half inches of 31A Modified, followed by a new synthetic surface. The 31A Modified shall be produced using 100 percent limestone aggregate. The technical specifications for these mixes are outlined below. In the event the asphalt is determined to be unsuitable for resurfacing, Alternate 200-1 shall apply, whereby the existing asphalt, which averages approximately 3.5 inches in thickness, including up to 4.5 inches of the underlying aggregate base, shall be uniformly crushed. Ninety-five percent of the crushed material must have a maximum particle size of 1.5 inches, with no particle size exceeding 4 inches. The crushed material, at a moisture content not greater than optimum, shall be compacted to not less than ninety-eight percent of its maximum unit weight. This item shall include scarifying, crushing, grading, shaping, rolling and compacting the existing HMA. Any water needed to obtain the required density shall be included in the lump sum price. Any aggregate base required to supplement or bolster the existing aggregate shall be MDOT 22A and shall be furnished, installed and paid

for by the ton. Once the above work is completed, the contractor will proof roll the new base with a loaded truck, which meets the approval of the engineer, to determine if there are any soft or unstable areas. If any of these conditions are encountered, the contractor will do subgrade undercutting Type II as indicated by the engineer. If determined necessary by the Engineer, four inch perforated, geotextile wrapped, underdrains shall be installed as directed, and connected to the existing drainage structures.

The new asphalt pavement shall consist of two inches of 13A modified leveling course, followed by one and one-quarter inches of 31A modified surface. The 31A modified shall be produced using 100 percent limestone aggregate. The technical specifications for these mixes are outlined below.

For both the Base Bid, and Alternate 200-1, the existing long jump and pole vault runways shall be demolished, and replaced with concrete.

Minimum traffic control shall provide for safe ingress and egress, and protection of employees, students and local residents from the construction operation. A traffic control plan provided by the contractor shall be approved by the engineer.

All materials not incorporated into the work will be removed from the site; any areas that are disturbed by the construction will be repaired to a “like” condition. Payment for this work will be included in other items of work.

As part of this contract, the contractor shall provide and install pole vault box SSBU & Cover, and long jump board HTB-16 from Aluminum Athletics Equipment. Local representative – Pete Woods (888) 853-7620. Approved equals to these products may be considered.

This contract shall also include labor, equipment, materials and related work for a synthetic surfacing system on the track-and-field event areas. The technical specifications for this system are outlined below.

The successful bidder shall furnish separate performance and payment bonds, each with limits of 100 percent of the contract sum. Bonds shall be co-oblige bonds naming both the owner and Dailey Engineering, Inc. as principals. Bonds shall be secured from bond organizations licensed to underwrite within the State of Michigan, and both form and substance shall be subject to the review and approval of the owner and Dailey Engineering, Inc.

Prior to determination of bonding, and therefore, award, the successful bidder shall be prepared to provide evidence of experience and financial stability as may be requested by the owner or Dailey Engineering, Inc., including audited financial statements.

II. TERMINOLOGY

Quality Control (QC) - All activities that have to do with making the quality of a product according to specifications, including training, materials sampling and testing, project oversight, and documentation.

Quality Assurance (QA) - All activities that have to do with making the quality of a product according to specifications including materials sampling and testing, construction inspection, and review of contractor quality control documentation.

Bituminous Mix Design - The selection and proportioning of aggregate(s), mineral filler (if required), reclaimed asphalt pavement (RAP) and asphalt binder such that the specified mixture design criteria are met. Laboratory evaluation is required to determine if the stated mix design complies with specifications.

Job Mix Formula (JMF) - A bituminous mixture for a specific project. This may include adjustments to the mix design to optimize the field application.

Target Value - A JMF parameter value that may be adjusted, if approved by the engineer, to account for changes in the physical properties of the mixture.

JMF Adjustment - The contractor may propose an adjustment to the JMF based upon QC and/or QA test results. The proposed JMF must meet the requirements of the 2003 Standard Specifications for Construction. When approved by the engineer, a JMF adjustment may be applied retroactively to one lot, for parameters with target values.

Voids in Mineral Aggregate (VMA) - The volume of void space between the aggregate particles of a compacted paving mixture that includes the air voids and the asphalt binder, including the absorbed asphalt binder, expressed as a percent of the total volume of mixture.

Effective Specific Gravity (Gse) - The ratio of the oven dry weight in air of a unit volume of an aggregate (excluding voids permeable to asphalt) at a stated temperature to the weight of an equal volume of water at a stated temperature.

Bulk Specific Gravity of Aggregate (Gsb) - The ratio of the oven dry weight in air of a unit volume of an aggregate at a stated temperature to the weight of an equal volume of water at a stated temperature.

Maximum Specific Gravity of Mixture (Gmm) - The ratio of the weight in air of a unit volume of an uncompacted bituminous paving mixture at a stated temperature to the weight of an equal volume of water at the same temperature.

Lot - Bituminous mixture produced and placed under this special provision is evaluated on a lot-by-lot basis. A lot is made up of a discrete tonnage of one mixture. Each lot is made up of three sublots. These sublots will be of approximately equal size up to a maximum of 2000 tons. The sublot size shall be approved by the engineer prior to the start of production. The contractor may request a change in the sublot size during production based upon the contractor's ability to produce a mixture that meets the specification contained within the

contract documents, and upon approval of the engineer.

If only one or two sublots are included in a lot at the end of production, they will be combined with the previous lot using the same mix, and this combined lot will be evaluated based upon all sublot samples.

Lot Average Test Result - The average of all sublot QA test results, for a specific parameter, for the lot. Test results for any sublot removed from the project will not be used in calculating a lot average. However, the replacement material will be tested and the results included in the lot average.

Process Quality Control Targets - These targets are established by the contractor based upon initial production lot test results (and from any approved trial run) for air voids, VMA, asphalt binder content and Gmm. QC tolerances will be applied to these established targets to determine the need for production changes, including stopping production, to control the quality of the product. Process quality control targets must be reported to the engineer prior to the end of placement of the second lot.

Rounding of Numbers - Rounding of numerical data will follow ASTM E 29-93a, as described in the MDOT Bituminous QC/QA Procedures Manual of Field Testing.

Random Sampling - Selection of QA samples (bituminous mixture and density) and verification samples will be by a random process managed by the engineer. The contractor will be given the opportunity to observe the sampling process. However, the random numbers selected and the sampling locations will not be revealed to the contractor until the time of sampling in order to avoid bias in the random sampling process.

III. SAMPLING AND TESTING

The following sampling and testing procedures are to be followed in completing this work.

ASTM D 1559-89 Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (Section 4.5).

ASTM D 2172 Test Methods for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures.

ASTM D 2041 Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures.

ASTM D 2726 Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Saturated Surface-Dry Specimens.

ASTM C 136 Test Method for Sieve Analysis of Fine and Coarse Aggregates.

ASTM C 117 Test Method for Materials Finer Than 75-µm (no. 200) Sieve in Mineral Aggregates by Washing.

ASTM E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications.

MTM (Michigan Test Method) 311 Determining Aggregate Gradation for Bituminous Mixture.

MTM 117 Determining Percentage of Crushed Particles in Aggregates.

MTM 118 Measuring Fine Aggregate Angularity.

MTM 110 Determining Deleterious and Objectionable Particles in Aggregates.

MTM 319 Determination of Asphalt Content from Asphalt Paving Mixtures by the Ignition Method.

MTM 313 Sampling Bituminous Mixtures.

Equipment. All equipment requirements to perform these sampling and testing procedures shall apply.

IV. QUALITY CONTROL (CONTRACTOR)

a. Bituminous Mixture: The contractor will take random samples of loose mixture at least every 400 tons of mixture, or a sampling frequency agreed upon with the engineer. The engineer will be provided a split sample of all QC samples taken by the contractor. This sample may be taken anywhere in the production process, except behind the paver. The contractor will be responsible for establishing process quality control targets for air voids, asphalt binder content, aggregate gradation, Gmm, obtaining QC samples, and conducting QC testing in accordance with the contractor's quality control plan (QCP).

Each QC sample shall be identified to allow all test reports to be linked to a specific lot or sublot within the project.

The contractor shall maintain daily control charts and have them available for review at the plant at all times. Copies of these control charts shall be provided to the engineer if requested. All test results shall be plotted and used in quality control decisions. When corrective action is necessary, the contractor shall notify the engineer in writing of the specific action taken, if it required a JMF adjustment.

b. In-place Density: The contractor will have a density gage available for quality control testing during the compaction process. The contractor will also have the capability to take 6" cores from random locations throughout the paved area for acceptance testing. The contractor may take up to three informational cores from each mixture type, to help correlate the density gage. Minimum in-place density shall average 95 percent of theoretical maximum density, Gmm.

V. QUALITY ASSURANCE (ENGINEER)

a. Bituminous Mixture: The engineer may collect bituminous mixture (loose) quality assurance samples and provide the contractor with splits of these samples.

If the criteria for the verification procedure are satisfied, the contractor's test results may be incorporated into the acceptance and payment decisions for the mixture. During the course of production, the engineer may acquire random samples at any point in the production process. These samples may be tested to determine if the mixture, the aggregate and the binder meet all of the specification requirements contained in the contract document. As the samples are collected, the engineer may assign an alphanumeric identifier to the sample and split, which can be used to trace the test results to the lot and sublot. This alphanumeric identifier may be included on all engineer test reports associated with that sample. An example is 4-2-A, which might designate the engineer's split (A) of the sample from sublot 2 of lot 4 on a project.

A minimum 16,000 gram sample may be taken. The sample will be divided equally for contractor and engineer testing. The following tests may be conducted by the engineer on the QA sample splits.

1. Maximum Specific Gravity, Gmm (ASTM D 2041)

2. Bulk Compacted Density (ASTM D 1559, paragraph 4.5)
3. Air Voids (calculated)

4. Voids in Mineral Aggregate, VMA (calculated)

5. Composition of the Mixture - Asphalt binder content based on calculated value using sublot maximum specific gravity (Gmm) and current JMF effective specific gravity (Gse). The retained Gmm sample may be used for gradation (ASTM C 136, C 117) and crushed particle content (MTM 117) from extracted (ASTM D 2172) or incinerated (MTM 319) aggregate, or from MTM 311.

b. In-Place Density: The engineer may identify random core sample locations for each sublot based on longitudinal and transverse measurements. The engineer will mark each core location with a paint dot, which represents the center of the core. The contractor shall drill a 6" core sample at each core location. The contractor shall notify the engineer sufficiently in advance of coring to ensure that a representative can be present to witness the coring and take possession of the core. The core density shall be calculated using the TMD from the test data obtained from that day's sample. The core samples shall be taken after final rolling.

As an option, when mutually agreed to by the engineer and contractor, the core samples may be waived and the density gage will be used for acceptance testing.

Core samples shall not be damaged during removal from the pavement. If, for any reason, a core is damaged or determined not to be representative at the time of coring, the engineer will evaluate and document the problem and determine if re-coring is necessary.

All previous pavement, base aggregate or bond coat material shall be sawed off the bottom of the core samples.

The core holes shall be filled with hot mixture and thoroughly compacted as part of the coring operation. The method of filling holes and obtaining compaction shall be agreed upon prior to production. Pavement density acceptance testing will be completed within one (1) work day after the cores were taken. Testing will be in accordance with ASTM D 2726. The test results on the compacted bituminous mixture will be used as a basis of acceptance and payment.

VI. VERIFICATION OF QUALITY CONTROL TEST

a. General Procedure: The engineer will review the contractor's sampling and testing procedures, their test results and any engineer quality assurance test results. If, in the opinion of the engineer, sampling and testing procedures are proper, the contractor's quality control test data may be used for acceptance decisions.

The contractor's QC test results may be considered verified if the following criteria are satisfied:

1. The difference between the contractor's QC test results and the JMF fall within the single test tolerance shown in Table 1, or
2. The difference between the engineer's test results and the contractor's test results fall within the single test tolerance shown in Table 1.

If the difference between the contractor's QC test results, compared to the JMF, exceed the single test tolerances shown in Table 1, the engineer's test results will be used as the acceptance test. If the sublot is not verified, the contractor shall be notified and given a copy of the test results. Both the contractor and the engineer will verify that testing equipment is calibrated and operating properly, and correct testing procedures have been followed. Unless it is documented that the difference resulted from equipment or procedural problems, the engineer's test results will remain as the acceptance test of record.

The cost of one verification test per mixture type shall be paid by the owner. Any additional mixture verification testing for acceptance shall be paid for by the contractor.

VII. PROJECT DOCUMENTATION

a. General: The format of all test reports and quality control charts to be submitted by the contractor will be approved by the engineer before mixture production is allowed to commence. Suggested formats of reports and charts are available from the engineer. Project documentation to be provided by the contractor shall include, but may not be limited to, the following.

b. Lot Basis:

1. A complete report of QC tests shall be submitted to the engineer within 24 hours of the time the last tests were completed.
2. Control charts of all test data must be current (data should be plotted as soon as the test is complete) and available for review by the engineer.

c. Project Summation:

1. Control charts for all test data indicating individual test values, lot averages and the running average of five.
2. A tabulation of all test data including sublot data, lot averages, project average, project standard deviation and a projection of which lots are subject to a price adjustment.

VIII. MEASUREMENT AND PAYMENT

Bituminous Mixture Price Adjustment

a. General: Adjustments to the contract unit price for bituminous mixture will be calculated for each of four sets of criteria. The largest adjustment allowable in each case will be imposed and unit price adjustments will be applied cumulatively (lot pavement density + pavement density + bituminous mixture + failure to suspend operations) to the affected tonnage. Each of the unit price adjustments is detailed below.

b. Bituminous Mixture: If, for asphalt binder content, air voids, Gmm or VMA, the difference between the lot average and the JMF is within the lot average tolerance shown in Table 2, no adjustment will be made to the unit price for **Bituminous Mixture** under this criteria. If the lot average tolerance is exceeded for one or more parameter(s), a negative adjustment will be made to the contract unit price for **Bituminous Mixture** in accordance with Table 2. Only the largest of the four possible pay adjustments for this set of criteria will be assessed. This price adjustment is applied to the entire lot tonnage.

c. Pavement Density: Based on pavement cores or the density gage, either a 10 percent or a 25 percent adjustment in the **Bituminous Mixture** contract unit price may be imposed. The following criteria will be used and only the highest calculated pavement density price adjustment will be applied. This price adjustment is applied to the entire lot tonnage.

1. A negative 10 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 95.0 percent, but equal to, or greater than, 94.0 percent.
2. A negative 25 percent adjustment in the **Bituminous Mixture** contract unit price will be imposed if the lot average pavement density is less than 94.0 percent, but equal to, or greater than, 92.0 percent.

IX. REMOVAL

a. General: The cost of the mixture removed and the removal cost will be borne by the contractor. Removal decisions will be applied to individual sublots.

b. If the pavement density for any sublot (average of sublot cores) is less than 92.0 percent, the contractor shall remove and replace the sublot.

c. The engineer reserves the right to evaluate any sublot whose test results for asphalt binder content, Gmm, VMA, or air voids, exceed the single test tolerances shown in Table 1. If the engineer determines that the in-place mixture will not perform in accordance with normal standards, the contractor shall remove and replace the sublot.

TABLE 1 : Bituminous Quality Assurance Testing Tolerances (+ or -) from JMF

Parameter	Single Test	Lot Average
Air Voids	1.00%	0.60%
Voids in Mineral Aggregate (VMA)*	1.20%	0.75%**
Maximum Specific Gravity (G_{mm})*	0.019	0.012
Asphalt Binder Content*	0.50%	0.35%

*Parameters with Target Values
**Or less, determined by VMA Value from the 2003 Standard Specifications for Construction.
The engineer retains the authority to make necessary adjustments to the JMF to ensure compliance with the intent of the specifications.

TABLE 2: Bituminous Mixture Pay Adjustments

Parameter (lot average)	Deviation (d)	Negative Unit Price Adjustment (%)
Asphalt Binder Content (deviation from JMF)	$0.35 < d \leq 0.55$	10
	$d > 0.55$	25
Air Voids (deviation from JMF)	$0.6 < d \leq 0.7$	2
	$0.7 < d \leq 0.8$	4
	$0.8 < d \leq 1.0$	6
	$1.0 < d \leq 1.1$	8
	$1.1 < d \leq 1.2$	10
	$d > 1.2$	25
Maximum Specific Gravity (G_{mm}) (deviation from JMF)	$0.012 < d \leq 0.014$	2
	$0.014 < d \leq 0.015$	4
	$0.015 < d \leq 0.017$	6
	$0.017 < d \leq 0.019$	8
	$0.019 < d \leq 0.021$	10
	$d > 0.021$	25
Voids in Mineral Aggregate (VMA) (deviation below minimum value in the 2003 Standard Specifications for Construction)	$0.0 < d \leq 0.1$	2
	$0.1 < d \leq 0.3$	4
	$0.3 < d \leq 0.4$	6
	$0.4 < d \leq 0.5$	8
	$0.5 < d \leq 0.6$	10
	$d > 0.6$	25

X. TECHNICAL SPECIFICATIONS

Section 304. Bituminous Mixtures

304.01 Description. Construct the bituminous leveling and surface courses.

The contractor will furnish all necessary machinery, tools, apparatus and other means of construction to do all the work, and furnish all the materials, except as otherwise specified, to complete the work in strict accordance with the plans and specifications included in this proposal, and in strict compliance with the 2003 Michigan Department of Transportation Standard Specifications for Construction and special provisions.

304.02 Technical Specifications

1. Mix Design

Submit a four-point mix design, including regression chart, to the owner for review and approval. Mix design should follow the format as indicated in the Asphalt Institute Manual MS-2 Marshall Stability Method. The mixture maximum specific gravity shall be run at each point and an aggregate effective specific gravity will be calculated for each point. It is the intent of this specification for the contractor to produce mixture at the following parameters. If the engineer believes the contractor is producing mixture at the high end or low end of any of these specification limits, the engineer shall have the authority to make any changes he feels necessary to bring the mixture back to the specified parameters.

A. MIXTURE NUMBER:	13A Mod.	31A Mod.**
VMA % (eff. spec. gravity)	15.5	17.0
Air voids %*	2.5*	2.0
Fines to binder ratio (max.)	1.2	1.2
Fine angularity min.MTM 118	2.5	4.0
L.A. Abrasion % max.	40	40
Soft Particle % max.	8	0

B. GRADATIONS - Percent passing indicated sieve:		
1”	100	100
3/4”	100	100
1/2”	75-95	100
3/8”	60-90	100
#4	45-80	70-90
#8	30-65	40-75
#16	20-50	--
#30	15-40	15-45
#50	10-25	--
#100	5-15	--
#200	3-6	6-10
Crush (min.) MTM 117	60*	100

* Modified from MDOT specifications.

**Aggregate shall be 100 percent crushed limestone.

C. Final binder properties shall meet asphalt PG 58-28 for this project.

D. If the binder obtained from the RAP exceeds 17 percent of the total binder in the mixture, the contractor shall furnish documentation (i.e., blending chart) in order to determine the proper grade of the virgin binder required to achieve the desired final binder properties. No RAP shall be used in the 31A Modified mixture.

2. In-Place Density

The average in-place density of the mixture shall be a minimum of 95 percent of theoretical maximum density.

Crack Routing/Sawing and Sealing.
Cracks to be sealed will be identified by the engineer.

All cracks 3/8 inch to 5/8 inch shall be routed to 3/4 inch by 3/4 inch and cleaned of all debris to provide a reservoir for the crack sealer. All cracks must be thoroughly cleaned of dirt, sand, dust, vegetation and debris by the use of an air compressor, or a method approved by the engineer.

Cracks shall be filled with a rubberized sealant, approved by the engineer, which is heated to the temperature recommended by the manufacturer. It is important that the maximum temperature as recommended by the manufacturer not be exceeded. Care shall be used to ensure that the sealant does not cool while being applied. The final surface of the crack sealant shall be flush with, or no more than 1/4 inch below, the surrounding pavement surface.

The material for the crack filling shall be an approved hot poured rubberized sealer that meets ASTM specification D-3407 or D-6690.

XI. FIVE-YEAR WARRANTY

It is the intent of this document to provide the owner with a five-year warranty against defects caused by deficiencies in the materials and/or workmanship provided on this project. The warranty covers the following conditions:

1. Cracking as defined shall be any crack caused by improper joints in the pavement, either a construction joint, a butt joint, or any cracking caused by expansion or contraction of the pavement, i.e., thermal cracking. Cracks caused by fatigue or settlement will not be covered by this warranty. Reflective cracking that manifests through the new synthetic surface shall not be covered under the base bid.

2. Delaminating as defined shall be any instance where the surface course de-bonds from the underlying layer of asphalt pavement, causing slippage or complete separation.

3. Raveling as defined shall be any area where the aggregate or matrix becomes loose, or separates from the asphalt pavement. This condition will generally be caused by poor density or segregation.

Remedies for the conditions described above will be as follows:

1. Cracking. Any cracks over 3' in length and/or wider than 1/8" shall be corrected by routing/sawing and sealing or overband sealing, as directed by the engineer, with a sealer approved by the engineer.

2. Delaminating. Any area that exhibits delaminating will be repaired by removing the surface course and cleaning the leveling course, installing a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

3. Raveling. Any area that exhibits raveling, or a loss of aggregate or matrix, will be repaired by removing the distressed area, cleaning the leveling course, applying a bond coat and furnishing and installing a new surface course of a like hot mix asphalt.

At least once a year, for the duration of the warranty period, the owner will inspect the pavement to determine if any warranty work is necessary. If deficiencies are found, the owner will notify the contractor in writing as to the extent of the repairs needed. The contractor may also inspect the lot from time to time to determine if any warranty work is necessary. The contractor will be allowed to perform any warranty work that he feels will retard any further deterioration of any of the warranted conditions.

XII. PAYMENT

Payment for this work will be by lump sum, and will include all work shown on the drawings, including removing the asphalt pavement; removing from the site all excess materials; fine grading and compacting the aggregate base; and placing and compacting hot mix asphalt pavement etc.

XIII. SYNTHETIC TRACK SYSTEM

SUMMARY

Section Includes: This section describes labor, equipment, materials, and related work for a Track Surfacing System at track-and-field event areas.

SUBMITTALS

Product Data, Shop Drawings, Samples:

Certificates: Certify that materials comply with specification requirements.

Submit color samples of lane markings, etc.

Design Data, Test Reports, Certificates, Manufacturer's Instructions, Manufacturer's Field Reports

Project Record Documents, Operation and Maintenance Data, Warranty

Upon completion of track markings, a licensed professional engineer or land surveyor shall furnish an acceptable letter or certificate of accuracy to the Owner, or their representative, attesting to the accuracy of track markings and measurements and shall include copies of computations, calculations and drawings that were used to obtain this accuracy. The engineer or land surveyor shall affix his or her stamp to drawings and certificates.

QUALITY ASSURANCE

QUALIFICATIONS

Provide at least one person who shall be thoroughly trained and experienced in the skills required, who shall be completely familiar with the design and application of work described for this section, and who shall be present at all times during progress of the work of this section and shall direct all work performed under this section.

For actual finishing of asphaltic concrete surfaces, and operation of the required equipment, use only personnel who are thoroughly trained and experienced in the skills required.

DELIVERY, STORAGE AND HANDLING

Protection: Use all means necessary to protect the materials of this section before, during and after installation and to protect the work and materials of all other trades.

Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the engineer and at no additional cost to the owner.

SEQUENCING AND SCHEDULING

Coordinate all work with job site superintendent and all applicable trades.

WARRANTY

Provide minimum one (1) year warranty against defects for materials and installation, unless otherwise indicated.

PRODUCTS

MANUFACTURERS

Track surface using SEAL-FLEX Running Track Surfacing LR-6 (6 coats stranded rubber, 7 coats latex) for 3/8" minimum thickness. Contact Current Surfaces, (517-524-6610).

See track plan for approved alternate.

Others seeking approval shall see General Conditions.

MATERIALS

Rubber aggregate to base rubber course shall be properly ground and graded to a minus ¼ inch to a plus 16 mesh gradation. Rubber aggregate for SEAL-FLEX surface rubber course shall be properly ground and graded to a minus 8 mesh to a plus 16 mesh gradation.

Asphalt emulsion binder for surface binding and bonding function shall be a slow setting emulsified asphalt which shall comply with Specification M208-72 of the American Association of State Highway and Transportation Officials, test methods prescribed in ASSHTO T-59.

Latex compound for SEAL-FLEX binding function shall be in strict conformance with formulae and specifications as prescribed by the SEAL-FLEX Corporation, Laurens, Iowa.

Line Marking Paint: Lines, lane markings, and associated event markings shall conform to the National Federation of State High School Association, National Collegiate Athletic Association, or United States Tennis Court and Track Builders Association rules and specifications, whichever is appropriate and applies. The line paint material shall be water base acrylic latex, compatible with rubber and herein before specified latex material.

EXECUTION

EXAMINATION

Examine the areas and conditions under which work of this Section will be installed. Correct conditions detrimental to proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

PREPARATION

Protection: Protect adjacent surfaces. Mask abutting drainage system and clean after installation of product. Repair damage at no expense to owner. Properly dispose of all drums, extra product at no expense to owner.

Cleaning: After completion of installation, clean surfaces of excess or spilled asphalt materials to the satisfaction of the engineer.

Barricades: After installation, do not permit traffic on surface until it has dried and hardened. Provide barricades and warning devices as required to protect installation and the general public.

INSTALLATION

Surface Inspection: Prior to the application of the synthetic track surface, the asphaltic or concrete base shall be inspected for conformity to planarity requirements. The surface shall not deviate more than 1/8" in 10' from the specified grade when checked with a 10' straight edge. The surface may also be flooded with water to determine if any "bird baths" or low areas exist. Any area found not to be in conformance with the above requirements shall be repaired by others and allowed to cure prior to the application of the synthetic surface with compatible materials as approved by the manufacturer.

Curing: The asphalt surface shall be allowed to cure for not less than fourteen (14) days prior to any work being done. This timetable shall be agreed upon by the owner and the application contractor, based upon the time of year. This may change with the engineer's approval.

Cleaning: The area to be surfaced shall be clean and free of any loose or foreign particles (dirt, oil, etc.) prior to the commencement of the work.

APPLICATION

The binder shall be placed in an approved mixer tank equipped with suitable pump and spray systems so as to provide proper pressure and spray disposition at truck surface.

The base rubber aggregate shall be applied over entire surface specified to receive the rubber running surface. Upon completion of first layer, the rubber aggregate shall be sprayed with latex or asphalt emulsion with dilution and additives as formulated by the SEAL-FLEX Corporation. When thoroughly dry, rubber application and spray composition shall be repeated. Successive applications of base rubber surface shall then receive an application of surface rubber aggregate according to the specifications by the manufacturer to achieve the desired texture and spike protection.

Contractor shall use all means necessary to protect fencing and surrounding surface from latex and rubber materials sprayed.

Hudson Community Schools
Reconstruct High School/Middle School Track
Base Bid

Item	Unit	Amount	Unit Price	Total
Remove Synthetic Surface	SYD	4575		
Demolish Field Events	LS	1		
Crack Fill	LFT	2200		
Bituminous Mixture 31A Modified	Ton	330		
4" Concrete Runways	SFT	1985		
New Synthetic Surface SEAL-FLEX LR-6(Includes Stripping)	LS	1		
Field Event Hardware	LS	1		
Site Restoration	LS	1		
Mobilization	LS	1		
Total				

Note: Quantities shown above are engineering estimates only. Bidders shall base the lump sum proposal on their own take-off using the drawings.

Alternate 200-1

Item	Unit	Amount	Unit Price	Total
Remove Synthetic Surface	SYD	4575		
Demolish Field Events	LS	1		
Crush & Shape	SYD	4575		
Subgrade Undercut – Type II	CYD	250		
Aggregate Base – 22A	TON	250		
4” Edge Drain	LFT	500		
Bituminous Mixture – 13A Modified	TON	525		
Bituminous Mixture – 31A Modified	TON	395		
4” Concrete Runways	SFT	1985		
New Synthetic Surface SEAL-FLEX LR-6(Includes Stripping)	LS	1		
Field Event Hardware	LS	1		
Site Restoration	LS	1		
Mobilization	LS	1		
Total				

Signed by_____

Contractor_____

Address_____

City_____ State_____ Zip_____

Dated_____

Note: Quantities shown above are engineering estimates only. Bidders shall base the lump sum proposal on their own take-off using the drawings.

SECTION 02540
SEAL COATING

2521 PART I GENERAL

2521.1 Related Documents

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

2521.2 Summary

A. This Section includes the following:
   1. Seal coating on existing asphalt near the track (see Drawing 200-C2.1).

2521.3 Definitions

A. Hot Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.
B. MDOT: Michigan Department of Transportation.

2521.4 Submittals

A. Product Data: For each type of product indicated include technical data and tested physical and performance properties.
B. Job-Mix Designs: For each job mix proposed for the Work.

2521.5 Delivery, Storage, and Handling

A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
B. Store pavement-marking materials in a clean, dry, protected location within temperature range required by manufacturer. Protect stored materials from direct sunlight.

2521.6 Project Conditions

A. Environmental Limitations: Apply seal coat materials within temperature and moisture recommendations established by the manufacturer.

2522 PART 2 PRODUCTS

2522.1 Sealcoat

A. Star-Seal or approved equal. Applied material shall contain a minimum of 2% macro-flex additive and 3 pounds of sand per gallon.

B. Sealcoat materials will be field inspected and tested. If the mix does not meet manufacturer's requirements, the contractor will bear the cost of the testing fees; and will be responsible for re-application of additional compliant sealcoating product.

2522.2 Auxiliary Materials

A. Sand: ASTM D 1073 or AASHTO M 29, Grade Nos. 2 or 3.

B. Water: Potable

C. Primer to be used on oil stains: Petroseal or approved equal

2522.3 Mixes

A. Seal Coat mix design:

Componet	Star-Seal (ga)	Water (ga)	Sand (lb)	Latex (ga)
Quantity	100	30	200-300	3-5

2523 PART 3 EXECUTION

2523.1 Seal Coating

A. Apply Star Oil Spot Cleaner (or equal) to all existing oil stains prior to applying seal coating.

B. Apply 2 coats seal coat in accordance with manufacturer's instructions.

END OF SECTION

SECTION 03300
CAST-IN-PLACE CONCRETE

3301 PART I GENERAL

3301.1 Section Includes

A. Reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.
B. Floors and slabs on grade.
C. Control, expansion and contraction joint devices associated with concrete work
D. Sidewalks, landings ramps, etc.
E. Underslab vapor barrier
F. Work provided by others: By the owner – payment of costs for concrete testing and inspection as hereinafter described.

3301.2 Related Sections

A. Section 07200 - Building Insulation: Perimeter Insulation

3301.3 References

A. ACI 211.1 - Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
B. ACI 301 – Specifications for Structural Concrete for Buildings
C. ACI 302 - Guide for Concrete Floor and Slab Construction.
D. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
E. ACI 305R - Hot Weather Concreting.
F. ACI 318 - Building Code Requirements for Reinforced Concrete.
G. ASTM C33 - Concrete Aggregates.
H. ASTM C94 - Ready-Mixed Concrete.
I. ASTM C150 - Portland Cement.
J. ASTM C260 - Air Entraining Admixtures for Concrete.
K. ASTM C330 - Light Weight Aggregates for Structural Concrete
L. ASTM C494 - Chemical Admixtures for Concrete.
M. ASTM C618 - Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
N. ASTM D1751 - Preformed Expansion Joint fillers for Concrete Paving and Structural Construction Non-extruding and Resilient Bituminous Types.

O. Reference Specification: To be complete, this specification Section requires the use of ACII 301-99 “Specifications for Structural

Concrete". This specification Section is intended to supplement and modify ACI 301 and will take precedence where conflict exists. Requirements of ACI 301 shall govern the work, except as noted herein.

3301.4 Quality Assurance

A. Perform Work in accordance with ACI 301.

B. Acquire cements and aggregate from same source for all work.

C. Conform to ACI 305R when concreting during hot weather.

D. Source Quality Control: Materials are subject to inspection and tests in field conducted by a qualified inspection agency. Such inspections and tests will not relieve contractor of responsibility for providing materials in compliance with specification requirements. Promptly remove and replace materials or components which do not comply.

1. The reinforcing steel supplier shall certify that all reinforcing steel has been manufactured in the United States and meets the designated ASTM specifications.

E. Testing:

1. As per ACI 301, Section 1, Article 1.6, except as noted.
2. Required testing services of Sections 1.6.4 and 1.6.5 will be performed by an independent testing laboratory employed by the Owner.
3. All samples shall be taken after any addition of water at the job site complete. When pumping or pneumatic equipment is used, samples shall be taken at discharge end. This is for both cylinders and slump tests.
4. Air Content:

a. Determine air content of concrete for each strength test by either the pressure method (ASTM C231) or the volumetric method (ASTM C173). The "chase" air indicator shall not be used.

b. Air content tests shall be made on all concrete whether the concrete is designated as air-entrained or not.

c. Additional air content tests, for concrete specified as air-entrained, shall be made when any of the following conditions occur:

1. A change in appearance or consistency of concrete
2. Possible reduction of air content due to time delays of truck and/or hot weather.

F. Contractor's Responsibility: Provide a box for storing concrete test specimens while on job; maintain temperature in the box between 60

and 80 degrees F, prevent loss of moisture from specimens in accordance with ASTM C31. Provide a Hi-Low thermometer in the storage box.

G. Evaluation and acceptance of concrete: Article 1.6.7, 1.6.8 and as follows: any test results on in-place concrete conducted without prior knowledge and input of the Engineer will not be accepted. Engineer reserves the right to reject any non-destructive test results that he considers improperly calibrated or correlated.

H. Acceptance of Structure: Article 1.7 and as follows: if 28 day test results do not meet requirements of Section 1.6.7, the Engineer shall have the right to order a change in mix proportions for remaining portions of structure. He may require core tests in accordance with Section 1.6.5.3 to be made at Contractor's expense. Any such testing shall be done by an independent testing agency acceptable to the Engineer.

I. Testing agencies affidavit that construction is in conformance with the drawings and specifications.

3301.5 Submittals

A. Product Data: Submit data for proprietary materials and items, including admixtures, patching compounds, waterstops, joint systems, curing compounds, finish materials, and others as requested by Engineer.

B. Mix Design: Submit mix designs for each concrete mix for the project per Chapter 5 of ACI 318-99. Mix designs shall include all back up material with compressive strength breaks based on field experience or breaks from a trail mix per Chapter 5.

3301.6 Delivery, Storage and Handling

A. See ACI 301, Section 5

B. Store reinforcement off the ground to avoid soiling by foreign materials.

3302 PART 2 PRODUCTS

3302.1 Materials, General

A. Where applicable, reference is made herein to material requirements given in ACI301.

B. Use manufactured materials in accordance with manufacturer's recommendations. If such recommendations differ from requirements specified herein, call to the Engineer's attention before proceeding. Generally, the more stringent requirements will apply.

3302.2 Forms Materials

A. General: As per ACI301, Section 2, Except as noted.

B. Forms for Exposed Finished Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials to provide continuous straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

C. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

D. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

3302.3 Reinforcing Materials

A. Reinforcement: As per ACI301, Section 3, Article 3.2, with selections and supplements as follows:

1. Reinforcing Bars: ASTM A 615, Grade as noted on drawings.
2. Welded Wire Fabric: ASTM A185 form plain wire, flat sheets

B. Supports for Reinforcement: Provide such items as bolsters, chairs and spacers for supporting, spacing and fastening reinforcing bars and welded were fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable. Supports shall be of the following types :

1. Precast Concrete Blocks: support reinforcement for slabs on grade.

C. Synthetic fibers: where utilized, synthetic fibers meeting the requirements of ASTM C1116 shall be added at a dosage rate of 1.5 1b/cu. yd.

3302.4 Concrete Materials

A. Cement: ASTM C150, Type I - Normal unless otherwise acceptable to Engineer.

1. Fine Aggregate: Clean, sharp, natural sand free from loan, clay lumps, or other deleterious substances.

a. Crushed stone, processed from natural rock or stone.

b. Limestone 6AA. Use of pit or bankrun gravel is not permitted.

c. Maximum Aggregate Size: Not larger than one-fifth of narrowest dimension between sides of forms, one-third of depth of slabs, nor three-fourths of minimum clear

spacing between individual reinforcing bars or bundles of bars.

B. Fine and Coarse Aggregates: ASTM C33.

C. Lightweight Aggregate: ASTM C330.

D. Water: Clean, potable and not detrimental to concrete.

3302.5 Admixtures

A. Air Entrainment ASTM C260.

B. Chemical: ASTM C494 Type A-Water Reducing; Type F - Water Reducing, High Range.

C. Fly Ash: ASTM C618 Type C may be substituted for up to 20 percent of Portland Cement in all mixes unless other otherwise noted.

3302.6 Accessories

A. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

3302.7 Joint Devices and Filler Materials

A. Expansion Joint Devises with appropriate splicing fasteners, full depth of joint.

3302.8 Concrete Mix

A. Mix and deliver concrete in accordance with ASTM C94.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 1 or Method 2.

C. Provide concrete in accordance with the concrete schedule at the end of this section.

D. For all flat work a water reducing agent shall be used to allow for a 4” - 6” slump before placement.

E. Use accelerating admixtures in cold weather only when approved by Engineer. Use of admixtures will not relax cold weather placement requirements.

F. The use of calcium chloride will not be permitted.

G. Use set retarding admixtures during hot weather only when approved by Engineer.

H. Add air entraining agent to normal weight concrete mix for all exterior concrete unless indicated otherwise. Add air entraining agent at the manufacturers prescribed rate to result in concrete at the point of placement having air content within the limits shown in the concrete schedule.

I. Add synthetic fibers to normal weight concrete mix for all areas indicated on the drawings.

3302.9 Curing Compounds and Sealers

A. Cure and seal compounds shall be a 25% solids acrylic film forming material. Not for any areas to receive finish flooring materials or penetrating sealers.)

B. Wax curing compound shall be Master Cure 200W (or equal).

3303 PART 3 EXECUTION

3303.1 Examination

A. Verify site conditions.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement and other items to be case into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

D. Inspect soil at bottom of foundation systems which will be subject to testing for soil bearing value by the testing laboratory, as directed by the Engineer. Place concrete immediately after approval of foundation excavations.

3303.2 Preparation

A. In locations where new concrete is doweled to existing work, drill holes in existing concrete, and insert steel dowels.

B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

3303.3 Placing Concrete

A. Place concrete in accordance with ACI 304.

B. Notify Engineer minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints and are not disturbed during concrete placement.

D. Separate slabs on grade from vertical surfaces with 1/2 inch thick premolded expansion joint filler (except integral walk and curb).

E. Extend expansion joint filler from bottom of slab to full depth flush with finished slab surface.

F. Provide control joints in slabs on grade to form panels or patterns as shown on slab plan. If no joints are shown, discuss joint locations with engineer prior to concrete placement.

G. Form control joints by saw cuts 1/4 to 1/3 inch the depth of the slab using powered cutters as soon as concrete has cured sufficiently to carry the machine weight without causing surface blemishes, but not later than 12 hours after concrete is placed.

H. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

I. Place concrete continuously between predetermined expansion, control, and construction joints.

J. Do not interrupt successive placement; do not permit cold joints to occur.

3303.4 Finish of Formed Surfaces

A. Rough Form Finish (RfFm-Fn): For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise shown or specified. This is the concrete surface having the texture imparted by the form facing material used, with tie holes and defective areas required and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth Form Finish (SMFm-Fn): For formed concrete surfaces exposed-to-view or that are to be covered with a coating material applied directly to the concrete or a covering material bonded to the concrete, such as waterproofing, dampproofing, painting, or other similar system. This is the as-cast concrete surface as obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams.

3303.5 Monolithic Slab Finishes

A. General Information (Slabs on Grade): Above average floor finish tolerances may be required. The requirements indicated are based upon the latest FF/FL method. Bids for this work shall reflect these requirements and enforcement thereof can be expected.

B. Trowel Finish 1 (Tr-Fn1) - Typical Interior Floors:

1. Specified Overall Value: FF 30/FL23
2. Minimum Local Value: FF 25/FL 20
3. Apply trowel finish to slab surfaces that are to be covered with resilient flooring, paint, or other thin film finish coating system.

C. Nonslip Broom Finish (NsBrm-Fn): Apply nonslip finish to exterior concrete platforms, steps and ramps, and elsewhere as shown in schedules.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom, perpendicular to main traffic route. Coordinate required final finish with the Engineer before application.

3303.6 Concrete Curing and Protection

A. General: Protect freshly placed concrete form premature drying and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.

1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 72 hours.

2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days and in accordance with ACI 301-84(87) procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by membrane-forming curing, and by combinations thereof, as herein specified.

1. Provide moisture curing by following methods:

a. Keep concrete surface continuously wet by covering with water.

b. Continuous water-fog spray.

c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously set. Place absorptive cover to provide coverage of concrete surfaces and edges with 4 inch lap over adjacent absorptive covers.

2. Provide moisture-cover curing as follows:

a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Provide membrane curing to slabs as follows:

a. Apply membrane-forming curing compound to concrete surfaces as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by powerspray or roller in accordance with manufacturer's directions. Recoat areas which are subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

3303.7 Miscellaneous Concrete Items

A. Concrete curing compounds and sealers:

1. Apply materials in strict accordance with the manufacturer's written instructions.

3303.8 Schedule - Concrete Types and Finishes

CONCRETE SCHEDULE

ITEM OR STRUCTURE	FINISH	COMPRESSIVE STRENGTH AND OTHER REQUIREMENTS
Concrete not otherwise indicated	RfFm-Fn, Sm-FM-Fn, if exposed	3500 P.S.I.
Foundations and footings,	RfFm-Fn, SmFm-Fn, if exposed	3500 P.S.I. 6% - +1- 11/2% air entrainment if exposed
Interior formed concrete exposed to view	SMFm-Fn	3500 P.S.I.
Interior floor Slabs	Tr-Fn1 Tr-Fn2 Tr-Fn3	3500 P.S.I.
Exterior walks, stoops, steps, aprons, and curbs	NsBrm-Fn	4000 P.S.I. 6%-+/-1 1/2% entrainment No Fly Ash Can use OGBFS Slag Cement up to 25-30% Substitution
Exterior formed concrete exposed to view	Grt-C1-Fn	

NOTE:
1. Compressive strength value after curing 28 days.
2. Slump to be 4" max.
3. Exterior concrete to have crushed limestone aggregate.

END OF SECTION

SECTION 04270
UNIT MASONRY

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the following masonry assemblies:

1. Concrete masonry units (CMU).
2. Brick.
3. Mortar and grout.
4. Flashing.
5. Insulation materials.
6. Masonry accessories.

1.2 SUBMITTALS

A. Product Data: For each indicated product.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store aggregates on grades such that site drainage will not contaminate aggregate.

B. Store masonry units, cementitious materials and accessories on elevated platforms in a dry location. Materials shall be kept covered with waterproof sheeting and secured from the wind. Do not use saturated materials per NCMA TEK Note 3-1B.

1.4 PROJECT CONDITIONS

A. Hot weather requirements: When ambient temperature is greater than 90^{o} F, comply with ACI 530.1/ASCE 6/TMS 602 Specification requirements. Provide approved admixtures only.

1.5 MASONRY PRE-CONSTRUCTION CONFERENCE

A. Masonry Pre-Construction Conference Requirements: Engineer

1. The General Contractor in conjunction with the Engineer shall schedule a Masonry Pre-Construction Conference at the jobsite at approximately 3 weeks prior to start of masonry work at the site.
2. All contractor submissions shall be submitted to the Engineer and reviewed prior to this conference.
3. Responsible assigned parties of the participants shall attend the conference. The General Contractor shall prepare and issue minutes of the meeting to all parties concerned.
4. Masonry work may not proceed without the Masonry Pre-Construction Conference.
5. Participants, representatives from:
   Owner
   Engineer
   General Contractor
   Project Superintendent

Mason Contractor Mason Foreman

B. The following is the agenda for the Masonry Pre-Construction Conference:

1. Review Contract Documents for Mason's clarifications and Engineer's intent.
   a. Engineer's summary for typical/atypical aspects of the Project.
   b. Locations of CMU control joints and brick expansion joints.
   c. Contractor's concern for missing/incomplete details.
   d. Verify use of up-to-date plans/specifications.
   e. Installation procedures.
   f. Coordination issues with other trades.
   g. Protection of and scheduling of non-masonry construction that will interfere with masonry work.
   h. Open issues/concerns.
   i. Job-Site storage and staging areas.
1. Submittal issues.
   a. Mortar type, proportions and mix design.
2. Verify material samples that have been reviewed/accepted.
3. Review contractor's proposed hot weather construction procedures and Project Specification requirements.

PART 2 – PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. Concrete Masonry Units (CMU): ASTM C 90, lightweight or medium weight.

1. Specified Size: Manufactured to 3/8 inches less than the nominal face of 16 inches long by 8 inches high, width as indicated.
2. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bond beams, and other special conditions as indicated on the Drawings.

2.2 BRICK (VENEER WYTHE)

A. General: Provide shapes as indicated on the drawings and as follows:

3. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
4. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Brick: **ASTM C 216, Grade SW**

1. Brick selection is underway, and will be identified via an addendum.

2.3 MORTAR AND GROUT MATERIALS

A. Contractor shall select one of the following cement options for mortar:

1. Masonry Cement: ASTM C 91.

2. Mortar Cement: ASTM C 1329.
3. Portland Cement-Lime:
   a. Portland Cement: ASTM C 150, Type I or II, except Type III may be used when temperature is below 40° F during construction. Provide natural or white color cement as required to produce mortar color indicated.
   b. Hydrated Lime: ASTM C 207, Type S.

B. Cement for Grout: Portland Cement, ASTM C150.

C. Aggregate for Mortar: ASTM C 144.

D. Aggregate for Grout: ASTM C 404.

E. Water: Potable, clean and free of deleterious materials.

2.4 EMBEDDED FLASHING SYSTEM MATERIALS

A. Metal Drip Edges: ASTM A 167, Type 304, stainless steel, 0.0156 inches thick.

1. Metal Configuration: Extend at least 3 inches horizontally into wall and 1/2 inch out from exterior face of wall with outer edge bent down 30 degrees and hemmed.
2. Sealant: One-part non-skinning butyl sealant conforming to ASTM C 1311.

B. Flexible Membrane Flashing: For membrane flashing not exposed to the exterior, provide one of the following:

1. Copper-Laminated Flashing: 5 oz/sq. ft. copper bonded with asphalt between 2 layers of glass-fiber cloth.
2. Rubberized-Asphalt Flashing: Composite bonded flashing product of a rubberized-asphalt adhesive compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
3. Elastomeric Thermoplastic Flashing: Composite of rubberized-asphalt adhesive, 0.025 inch thick, bonded to a polyester-reinforced ethylene interpolymer alloy.
4. EPDM Flashing: ASTM D 4637, ethylene-propylene-diene terpolymer, 0.040 inches thick.
5. Adhesives, Primers, Sealants, and Seam Tapes for Flexible Membrane Flashings: Provide manufacturer's recommended products.

C. Weep/Vent:

1. Partially Open Head Joint.

D. Cavity Drainage Material: Provide one of the following:

1. Pea Gravel: Clean, hard, durable free-flowing naturally rounded particle of rock, free of clay, silt, and fine particles, with 100% passing a 3/8 inch sieve and not over 5% passing a #8 sieve.
2. Free-Draining Mesh: Free-draining polyethylene strand mesh designed to catch mortar droppings and prevent weep holes from being clogged.

2.5 INSULATION MATERIALS

A. Insulation for cavity:

1. Extruded-Polystyrene Board Insulation: ASTM C 578, closed-cell product extruded with an integral skin.
   i. Type IV 2-1/8 inch thickness, R-12.
   or
   ii. Type X 2 inch thickness, R-10.

2.6 MISCELLANEOUS ACCESSORIES

A. Masonry Cleaners: Proprietary cleaner(s) for the appropriate masonry surface as recommended by the masonry material manufacturer.

2.7 MORTAR AND GROUT MIXES

A. General: Specified admixtures may be provided as indicated below. If admixture is used, add at same rate for all exposed mortar to ensure consistent mortar color, regardless of weather. Test for compatibility with other products and assemblies.

B. Mortar Mix: ASTM C 270, Proportion Specification.

1. Type N or S for reinforced masonry and all other masonry work.
2. Admixture: Specified mortar admixtures.

C. Standard Grout Mix: ASTM C 476, slump of 8 to 11 inches measured per ASTM C 143.

1. Provide fine or coarse grout per ACI 530/ASCE 5/TMS 402, Table 1.15.1, Grout Space Requirements, based upon height and CMU cell size.
2. ASTM C 476 grout mix shall be determined by the following method:
   a. Table 1 Grout Proportions By Volume.

PART 3 – EXECUTION

3.1 INSPECTION

A. Inspect concrete foundations for compliance with tolerances of ACI 117, and verify reinforcing dowels are positioned in accordance with the Drawings.

B. Foundation and/or Load-Bearing Masonry Wall Discrepancies:

1. Notify the Engineer, in writing of discrepancies.
2. Do not proceed with masonry work until conditions have been corrected.

3.2 PREPARATION

A. Contractor shall prepare the foundation surface for adequate masonry bond.

B. Do not wet CMUs before placing.

C. Place steel reinforcement free of mud and debris in grout spaces prior to grouting.

D. Protect non-masonry adjacent surfaces during construction until cleaned.

3.3 PLACEMENT – GENERAL

A. Place masonry units in running bond pattern unless otherwise noted.

B. Construct 3/8 inch (+/- 1/8 inch) mortar bed joints when masonry units are compressed onto mortar.

C. Construct 3/8 inch (-1/4, +3/8 inch) mortar head joints when masonry units are shoved into mortar.

D. Construct full mortar bed joint on foundation. Joints shall not be less than 1/4 inch and not more than 3/4 inch when masonry units are compressed onto mortar.

E. Tool mortar joints to a concave profile on interior face of wall when mortar is thumbprint hard. Mortar joints on exterior (cavity) face of backup wythe may be tooled or struck flush.

F. Remove mortar joint protrusions extending 1/2 inch or more into CMU cells to be grouted.

G. Place hollow CMU with mortared face shells on head and bed joints.

H. Mortar bed joints on CMU cross webs where individual CMU cells are to be grouted.

I. Place solid masonry units with full-mortared head and bed joints.

J. Discard mortar mixed 2-1/2 hours after initial mixing. Retempering of non-colored mortar within the 2-1/2 hours is permitted. Retempering of colored mortar is not permitted.

K. Where indicated, at integral corners, overlap units full width of wythe.

L. Place masonry units within the following tolerances:

1. Bed joints and top of bearing walls can vary from level +/- 1/4 inch in 10 feet up to +/- 1/2 inch maximum.
2. Variation from plumb and true to a line may vary from +/- 1/4 inch in 10 feet, +/- 3/8 inch in 20 feet up to +/- 1/2 inch maximum.
3. Alignment of the bottom of the wall to the top may vary +/- 1/2 inch for load-bearing walls and +/- 3/4 inch for non-load-bearing walls.
4. Do not tooth masonry unless specifically approved in writing.

M. Install flashings, on clean, solid and undamaged surface. Provide flashing at all locations indicated. Extend flashings to outside face of wall and terminate as indicated. Form end dams at horizontal terminations of flashings. All vertical legs at the backup shall be embedded or mechanically fastened. Lap joints a minimum of 6 inches and seal with compatible material.

N. Keep masonry surfaces clean during construction. Remove all mortar drippings, tags and stains before they cure. Use a light brush sweep across the exposed masonry surfaces upon initial mortar set.

O. Cover tops of CMU walls at completion of each day's work as practicable as possible. Covering shall remain to minimize water and debris intrusion of ungrouted cells until permanent closure of walls occurs.

3.4 PLACEMENT – VENEER WYTHE

A. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying. Install cut units with cut surfaces and cut edges concealed.

B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

C. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 or as otherwise approved.

D. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and where possible, at other locations.

E. Bond Pattern: Unless otherwise indicated, lay masonry in running bond, do not use units with less than nominal 4 inch horizontal face dimensions at corners or jambs.

F. Built-in Work: As construction progresses, build in items specified (door frames, window frames, fire extinguisher cabinets, etc.) as required. Fill in solidly with masonry around built-in items.

G. Fill space between steel frames and masonry solidly with mortar, unless otherwise indicated.

H. Mortar Bedding and Jointing:

1. Lay hollow units with face shells fully bedded in mortar and with head joints of depth equal to bed joints.
2. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
3. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

3.5 CAVITY WALLS

A. Bond wythes of cavity walls together using horizontal masonry joint reinforcement as follows:

1. Use adjustable (two piece) type reinforcement to allow for differential movement regardless of whether bed joints align.

B. Keep cavities clean of mortar droppings and other materials during construction. Batter mortar beds away from cavity, to minimize mortar protrusions into cavity. Do not furrow mortar. Do not attempt to trowel or remove mortar fins protruding into cavity.

C. Installing Cavity-Wall Insulation: Fit insulation between wall ties and other confining obstructions, with edges butted tightly. Press units firmly against inside wythe of masonry. Adhere insulation to the inside wythe.

3.6 GROUT PLACEMENT

A. Place grout within 1-1/2 hours from mixing and prior to initial set of grout.

1. Do not exceed the grout pour heights of ACI 530.1/ASCE 6/TMS 602.
2. Place grout in lifts not exceeding 5 feet high.
   a. If there is a significant delay, stop grout minimum of 1-1/2 inches below the top of masonry to form a shear key with the next lift.
3. Consolidate grout at time of placement for pours of 12 inches or less by mechanical vibration or puddling.
4. Consolidate grout at time of placement for pours exceeding 12 inches by mechanical vibration and reconsolidate by mechanical vibration while grout is still plastic.

3.7 MASONRY CLEANING

A. Keep masonry faces clean during construction whenever possible, i.e. remove all mortar tags and stains before they cure, a light brushing with a soft brush upon initial mortar set, minimize mortar run-down with wet masonry units, minimize water entry into constructed walls, remove mortar build up from scaffold, protect all wall projections from mortar splashes, turn over planks to avoid mortar splashes when not working, protect base of wall from all mortar and mud splashes and remove grout spills immediately.

B. Before cleaning masonry, protect other masonry and other non-masonry surfaces as necessary to prevent damage

C. If pressure washer is to be used, cleaning procedures shall not damage finished masonry.

3.8 CLEAN UP

A. Remove all masonry related debris and properly dispose of off site.

END OF SECTION

SECTION 04300
EXTERIOR MASONRY RESTORATION

4301 PART I GENERAL

4301.1 Related Documents

A. The provisions of the General Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

4301.2 Summary

A. Section includes the following scope of work:
   1. Exterior Brick Masonry on the Lincoln Elementary Cafeteria Exterior Walls.
      a. Tuckpoint defective mortar joints
      b. Replace damaged brick and other repairs as shown on the drawings
      c. Perform masonry restoration cleaning
      d. Apply a clear liquid water repellent

B. All masonry restoration work is to be bid as alternate 100-2.

4301.3 Project Conditions

A. The Contractor is responsible to inspect the existing masonry and review the design drawings to become familiar with the scope of work.

B. Prior to beginning the work, the Contractor shall meet with the owner's representative and arrange the work schedule of the project. Once the work is started, it shall proceed to completion without delay.

C. Scaffolding, Ladders, Hoists, Etc.

   1. Furnish, install and maintain all scaffolding, ladders, hoists, etc. as may be required for the proper execution of work.

   2. Reasonable access to the work will be provided by the Contractor to the owner for the propose of inspection.

   3. All scaffolding, ladders, hoist and the like shall be promptly removed when no longer needed.

   4. The Contractor is to provide a safe environment and shall meet the legal requirements of MIOSHA laws.

4302 PART 2 PRODUCTS

4302.1 Mortar

A. Use Type N mortar to produce a minimum 750 psi average strength mixed with clean mortar sand and potable water. Mortar colored to match original as closely as possible.

4302.2 Brick Replacement

A. Brick replacement is anticipated to be quite limited, if necessary at all. Any brick required shall be purchased and secured by the contractor.

4302.3 Chemical Cleaners

A. SureKlean 600 detergent shall be used for mortar stains.

4302.4 Clear Liquid Water Repellent

A. Approved materials are as follows:

1. ProSoco Weatherseal PD.

4303 PART 3 EXECUTION

4303.1 Protection and Clean-up

A. The Contractor shall protect all parts of the buildings and adjacent structures and grounds from damage. Any damage or blemish to buildings or contents and grounds due to the Contractor's operations shall be promptly repaired at no cost to the owner.

B. All debris an unusable materials shall be removed from the site and disposed of by the Contractor.

4303.2 Masonry Tuckpointing and Brick Replacement

A. Scope of Work

1. Tuckpoint defective mortar joints and replace defective brick in exterior masonry surfaces.

B. Tuckpointing

1. Defective mortar joints as specified above are those in which the mortar is loose, missing, powdered, broken, hollow, unsound, soft, or eroded 1/4" beyond typical joint profile. Joints with hairline shrinkage cracks, but otherwise full and soled, will not be considered defective.

2. Preparation: Cutout defective mortar to a minimum depth of 3/4" with hand and power tools. Remove loose material and thoroughly rinse with water.

3. Application: Pack mortar tightly in thin layers until joint is filled, when properly set, tool to match existing mortar joints. Color mortar to match existing as closely as possible.

C. Brick Replacement

1. Remove all defective brick using powered and hand tools.
2. Defective brick being defined as-brick that are shaled, cracked, broken or otherwise unsound. Brick with hairline shrinkage cracks but otherwise sound, will not be considered defective. Provide sample of replacement brick for owners approval.
3. Provide necessary protection to all roofs, windows and ground from hazards of falling brick, etc.
4. Lay new brick in full bed of mortar tied to inner brick wrythe. Brick coursing to match existing adjacent surfaces.

D. Cleaning: Remove excess mortar from adjoining surfaces and newly pointed joints. Wash all wall surfaces joints with SureKlean 600 detergent.

4303.3 Masonry Restoration Cleaning

A. Scope of Work: Remove surface dirt, atmospheric carbons etc. and perform an overall general cleaning of the masonry surfaces in preparation for water-repellent application.

B. Chemical Cleaning:

1. Pressure clean to remove oxidation, staining, dirt, and grime as preparation for masonry sealer. Pressure settings shall be set to sufficiently clean the surface without causing damage.
2. Clean all wall surfaces with SureKlean 600.
3. Protect adjacent areas from any detrimental effects of the cleaning process.

C. Protection of Adjacent Work: The Contractor shall take all necessary precautions to protect all parts of the building not being cleaned from effects of the cleaning process.

4303.4 Clear Liquid Water Repellent

A. The coating shall consist of two applications of weatherseal PD for brick. It shall be applied per manufacturers' directions.

B. Surface shall be clean and dry. If alkali or efflorescence is apparent on the surface, it shall be treated with a neutralizing compound that will not affect finish sealer. Surface, air and material temperatures shall be a minimum of 40 degrees F during application for best results.

C. Upon completion of application, clean overspray from windows etc. Protect vegetation from overspray.

END OF SECTION

SECTION 05500
METAL FABRICATIONS

5501 PART I GENERAL

5501.1 Section Includes

A. Shop fabricated ferrous metal items.
   1. Brick ledge angle for HS/MS courtyard brick.
   2. Misc. framing and supports at Thompson Field visitor's bleachers.
   3. Pipe bollards at Lincoln Elementary.
   4. Aluminum Handrails and Railings at both Lincoln Elementary and HS/MS.

5501.2 Related Sections

A. Section 09900 - Painting: Touch up and Finish Paint.

5501.3 References

A. AAMA 608.1 - Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum.
B. ANSI A14.3- Ladders, Fixed, Safety Requirements.
C. ASTM A36 - Structural Steel.
D. ASTM A53 - Hot-Dipped, Zinc-Coated Welded and Seamless Steel Pipe.
E. ASTM A123 - Zinc(Hot-Dip Galvanized) Coatings on Iron and Steel Products.
F. ASTM 153 - Zinc Coating (Hot Dip) on Iron and Steel Hardware.
G. ASTM A307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
H. ASTM A500 - Cold Formed Welded and Seamless Carbon Steel Structural Tubing.
I. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
J. ASTM B209 - Aluminum and Aluminum-Alloy Sheet Plate.
K. ASTM B210 - Aluminum Alloy Drawn Seamless Tubes.
L. ASTM B211 - Aluminum-Alloy Bar, Rod, and Wire.
M. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
N. AWS A2.0 - Standard Welding Symbols.
O. AWS D1.1 - Structural Welding Code.
P. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.
Q. Stop and Touch-up Primer: SSPC 15, Type 1 Red Oxide.

5501.4 Submittals for Review

A. Section 01300 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type fasteners, and accessories. Include erection drawings, elevations and details where applicable.
C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

5502 PART 2 PRODUCTS

5502.1 Materials - Steel

A. Angles: ASTM A36.
B. Pipe: ASTM A53 grade B**.**
C. Welding Materials: AWS D1,1; type required for materials being welded.

5502.2 Fabrication

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

5502.3 Finishes - Steel

A. Prepare surfaces to be primed in accordance with SSPC SP 2, unless noted otherwise.

5503 PART 3 EXECUTION

5503.1 Installation

A. Install items plumb and level, accurately fitted, free from distortion or defects.

END OF SECTION

SECTION 07240
EXTERIOR INSULATED FINISH SYSTEM (EIFS)

PART 1 GENERAL

1.01 SUMMARY

A. Materials and installation of Air and Moisture Barrier and drainage EIF System.

1.02 DESIGN REQUIREMENTS

A. Wind Load

1. Design for maximum allowable system deflection, normal to the plane of the wall, of L/240.

2. Design for wind load in conformance with code requirements.

B. Moisture Control

1. Prevent the accumulation of water behind the EIF system, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly.
   a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.
   b. Air Leakage Prevention—provide continuity of Air Barrier System at foundation, roof, windows, doors and other penetrations through the system with connecting and compatible Air Barrier components to minimize conservation and leakage caused by air movement.

C. Color Selection

1. Select finish coat with a light reflectance value of 20 or greater. (The use of dark colors is not recommended with EIF Systems that incorporate expanded polystyrene [EPS]. EPS has a service temperature limitation of approximately 160° F [71°C]).

D. Joints

1. Design minimum 3/4 inch (19 mm) wide expansion joints in the EIFS where they exist in the substrate or supporting construction, where the EIFS adjoins dissimilar construction or materials, at changes in building height, and at floor lines in multi-level wood frame construction.

2. Design minimum 1/2 inch (13 mm) wide sealant joints at all penetrations through the EIFS (windows, doors, etc.).

3. Specify compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, “Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints,” and that meets minimum 50% elongation after conditioning.

4. Design joints so that Air Barrier continuity is maintained across the joint and drain. Joints to the Exterior.

E. Trim, Projecting Architectural Features and Reveals

1. All trim and projecting architectural features must have a minimum 1:2 [27°] slope along their top surface. All horizontal reveals must have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the EIFS wall plane, protect the top surface with waterproof base coat. Periodic inspections and increased maintenance may be required to maintain surface integrity of EIFS on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance. Refer to Sto details 1.04a and 1.04b.

2. Do not use EIFS on weather exposed projecting ledges, sills, or other projecting features unless supported by framing or other structural support and protected with metal coping or flashing. Refer to Sto detail 10.61.

F. Insulation Thickness

1. Minimum EPS insulation thickness is 1 inch (25 mm).

2. Maximum EPS insulation thickness is 12 inches (305 mm) when installed in accordance with ESR 1748 (including architectural features).

1.03 QUALITY ASSURANCE

A. Manufacturer requirements

1. Member in good standing of the EIFS Industry Members Association (EIMA).

2. System manufacturer for a minimum of twenty (25) years.

3. Manufacturing facilities ISO 9001-2000 certified Quality System.

B. Contractor requirements

1. Engaged in application of EIFS for a minimum of three (3) years.

2. Knowledgeable in the proper use and handling of Sto materials and possessing certificate of completion of Sto on-line application test.

3. Employ skilled mechanics who are experienced and knowledgeable in EIFS application, and familiar with the requirements of the specified work.

4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.

5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

C. Insulation board manufacturer requirements

1. Recognized by Sto as capable of producing insulation board to meet system requirements, and hold a valid licensing agreement with Sto.

2. Listed by an approved agency.

3. Label insulation board with information required by Sto, the approved listing agency and the applicable building code.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing and temperatures in excess of 90°F (32° C). Store away from direct sunlight.

C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.05 COORDINATION/SCHEDULING

(The work in this section requires close coordination with related sections and trades)

A. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors, and other penetrations to provide a continuous Air and Moisture Barrier.

B. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing.

C. Coordinate installation of windows and doors so Air and Moisture Barrier components are connected to them to provide a continuous Air and Moisture Barrier.

D. Install window and door head flashing immediately after windows and doors are installed.

E. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior.

F. Install copings and sealant immediately after installation of the EIF system and when EIFS coatings are dry.

G. Attach penetrations through EIFS to structural support and provide water tight seal at penetrations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide EIFS System, Air/Moisture Barrier and accessories from single source manufacturer or approved supplier.

B. The following are acceptable manufacturers:
   1. Sto Corp.— EIFS
   2. Dryvit Systems Inc.
   3. Plastic Components, Inc.---Accessories

2.02 AIR/MOISTURE BARRIER

A. Sto Guard—fluid applied air/moisture barrier for exterior wall sheathing. Apply 1 coat of Sto Gold Coat on Dens Glass sheathing.

2.03 ADHESIVE

A. Sto BTS Xtra—lightweight, one component, polymer-modified, cement based high build adhesive.

2.04 INSULATION BOARD

A. Nominal 1.0 lb/ft^3 (16 kg/m^3) Expanded Polystyrene (EPS) Insulation Board in compliance with ASTM E 2430 and ASTM C 578 Type I requirements.

2.05 BASE COAT

A Sto BTS Xtra—light weight, one component, polymer modified, cement based high build factory blend base coat.

2.06 REINFORCING MESHES

A. Standard Mesh

   1. Sto Mesh--nominal 4.5 oz./yd^2 (153 g/m^2), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials (*achieves Standard Impact Classificatio*n).

2.07 FINISH COAT

A. Stolit®Lotusan® —Acrylic based textured wall coating with Lotus-Effect®, pronounced self-cleaning performance.

2.08 JOB MIXED INGREDIENTS

A. Water--Clean and potable.

B. Portland cement – ASTM C150 Type I, Type II, or Type I-II.

2.09 ACCESSORIES

A. Starter Track---Rigid PVC (polyvinyl chloride) plastic track Part No. STDE as furnished by Plastic Components, Inc., 9051 NW 97th Terrace, Miami, Florida, 33178 (800-327-7077).

PART 3 EXECUTION

3.01 INSTALLATION

A. Install Air/Moisture Barrier and EIFS in compliance with manufacturer's published instructions. Ambient temperature must be 40 degree F or above during, and for 24 hours after the installation of all products.

3.02 PROTECTION

A. Provide protection of installed materials from water infiltration into or behind them.

B. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

SECTION 07310
ROOF SHINGLES

7311 PART 1 GENERAL

7311.1 Section Includes

A. Provide and install all roof shingles, drip edge and any other required accessories as indicated on the drawing 200-A1.2 and as specified herein.

1. This work is to be included as alternate 200-6.

7311.2 Submittals

A. Submit samples for selection purposes showing full range of colors and profiles available for Owner's selection.

7311.3 Quality Assurance

A. Delivery, Storage, and Handling

1. Deliver Materials to Project site in manufacturer's unopened bundles or containers with labels intact.
2. Handle and store materials at Project site to prevent water damage, staining, or other physical damage.

B. Project Conditions:

1. Weather Conditions: Proceed with work only when existing and forecasted weather conditions will permit work to be installed in compliance with manufacturer's recommendations and when substrate ins completely dry.

C. Warranty:

1. Submit a written warranty, executed by manufacturer, agreeing to repair or replace shingles that fail in materials or workmanship within the specified warranty period. Failure include, but are not limited to, deformation or deterioration of shingles beyond normal weathering. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have against the Contractor under the Contract Documents.
2. The warranty shall be 20 years (non-prorated) for materials, prorated beyond 20 years.

7312 PART 2 PRODUCTS

7312.1 A. Acceptable manufacturers include the following:

1. Certain Teed Corp. (Landmark)
2. GAF Building Materials Corp. (Timberline HD)
3. Owens Corning Fiberglass Systems Division (Oakridge)

B. Style:

1. Shingles shall be the equivalent of Gaf Elk Timberline HD, which has the following characteristics:
   a. Heavyweight architectural shingle.
   b. Classic wood shake design.
   c. Class A fire rating.

7312.2 Accessories

A. Felt Underlayment: 30 lb. unperforated organic felt complying with ASTM D226, Type 1, 36 inches wide (or equal).

B. Perimeter Underlayment: Polyethylene-sheet-backed rubberized asphalt membrane, 40 mils thick, 36 inches wide. Provide primer when recommended by underlayment manufacturer. Acceptable products and their manufacturers include the following:
   1. "Bituthene Ice & Water Shield", W.R. Grace & Co.
   2. "Polyken 640 Underlayment Membrane", Polyken Technologies.
   3. "Polyguard Deck Guard", Polyguard Products, Inc.
   4. "Ice Guard Membrane No. 108-AG", Royston Laboratories, Inc.
   5. "Jiffy Seal Ice and Water Guard", Protecto Wrap Co.

C. Smooth-Surface Roll Roofing: smooth surface asphalt roll roofing, 36 inches wide, complying with ASTM D 224, Type II.

D. Asphalt Plastic Cement: Nonasbestos fibrated asphalt cement complying with ASTM D 4586, designed for trowel application.

E. Nails: Aluminum or hot-dip galvanized steel, 11 of 12 gauge, sharp-pointed conventional roofing nails with barbed shanks, minimum 3/8 inch diameter head and of sufficient length to penetrate 3/4 inch into deck sheathing. Material of nails in contact with flashing shall match materials selected for flashing to prevent galvanic action.

7313 PART 3 EXECUTION

7313.1 Preparation

A. Coordinate installation with flashings and other adjoining work to ensure proper sequencing. Do not install roofing materials until all vent stacks and other penetrations through roof sheathing have been installed and are securely fastened against movement.

7313.2 Installation

A. Comply with manufacturer's installation instructions and recommendations**.**

B. Felt Underlayment: Apply one layer of felt underlayment horizontally over entire surface to receive asphalt shingles, lapping succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches, and hips and valleys a minimum of 6 inches. Fasten felt with sufficient number of roofing nails or noncorrossive staples to hold underlayment in place until shingle application.

   1. Omit felt underlayment at areas of perimeter underlayment. Lap felt underlayment over perimeter underlayment as recommended by manufacturer but not less than 2 inches.

2. Provide additional layer of felt underlayment for roofs with slope of 3 inches per foot or less.

C. Perimeter Underlayment: Apply minimum 24 inch wide layer of perimeter underlayment at eaves. Extend perimeter underlayment at eaves a minimum of 24 inches inside exterior wall line.

1. In addition to eaves, apply perimeter under layment at entire perimeter of surfaces to receive shingles, including valleys and rakes.

D. Install shingles beginning at lower end with a starter strip of roll roofing or inverted shingles with tabs removed. Fasten shingles in pattern, with weather exposure, and using number of fasteners per shingle as recommended by manufacture. Use vertical and horizontal chalk lines or premarked underlayment to ensure straight coursing.

1. Cut and fit shingles at ridges and edges to provide maximum weather protection.
2. Pattern: 1/3 spacing offset at succeeding courses.

E. Flashing: Install flashing as indicated.

END OF SECTION

SECTION 07410
STANDING SEAM SHEET METAL ROOFING

7411 PART 1 GENERAL

7411.1 Section Includes

A. Standing seam metal roofing.
B. Related flashing and accessories, including gutters and downspouts.

7411.2 References

A. SMACNA: "Architectural Sheet Metal Manual" Sheet Metal and Air Conditioning Contractors National Association. Inc.
B. AISC: "Steel Construction Manual" American Institute of Steel Construction.
C. AISI: "Cold Form Steel design Manual" American Iron and Steel Institute.
D. ASTM A792-89: Standard Specification for Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process, General Requirements.
E. ASTM A527-90: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.
F. ASTM A526-90: Standard Specification for Steel Sheet, Zinc, Coated (Galvanized) by the Hot-Dip process, Commercial Quality.
G. ASTM A446-91: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
H. ASTM E 283: Static Air Infiltration.
I. ASTM E 331: Static Water Infiltration.
J. UL 90 Rating: Wind uplift Approval Conforming to Underwriters Laboratories (UL) Section 580 Specifications.

7411.3 Submittals

A. Shop drawings, showing layout of panels, details of edge conditions, joints, corners, panel profiles, clips, trim, flashing and special details shall be submitted for approval.
B. Samples illustrating gauge, finish, color and texture of materials to be used shall be submitted for approval.

7411.4 Quality Assurance

A. Underwriters Laboratories (UL) wind uplift resistance classification: Roof assembly shall be classified as class UL 90 as defined by UL 580 specifications.
B. Field measurements will be taken prior to fabrication to assure symmetry.
C. Manufacturer's qualifications:
    1. Manufacturer has a minimum of three years experience in manufacturing panels of this nature a permanent, stationary, indoor production facility.
D. Installer's qualifications:
    1. Installation of panels and accessories by installers with a minimum of two years experience in panel projects of this nature.

7411.5 Warranty

1. Panel manufacturer shall provide a 20-year non-prorated warranty for the paint finish covering cracking, checking, blistering, peeling, flaking, shipping, chaulking and resistance to color fade.

7411.6 Product Delivery, Storage and Handling

A. Delivery: Deliver panels to job site properly packaged to provide protection against transportation damage.
B. Handling: Exercise extreme care in unloading, storing, and erecting panels to prevent bending, warping, twisting, end and surface damage.
C. Storage: Store all material and accessories above ground on well skidded platforms. Store under waterproof covering. Provide proper ventilation to panels to prevent condensation buildup between each panel.

7412 PART 2 PRODUCTS

7412.1 Materials

A. Panel profile:
   1. 1 - 3/4 in. high rib x 10 in. wide panel.
B. Panel Style:
   1. Narrow rib, vertical leg, concealed fastener, positive snap lock standing seam, utilizing male and female rib configurations, with factory applied hot melt mastic in female rib.
   2. Narrow rib, concealed fastener, positive snap lock standing seam, utilizing male and female rib configurations.
C. Gauge:
   1. 24 gauge (# UL-90 rated - Underwriters Laboratories).
D. Substrate:
   1. Galvinized steel sheet, 0.55 ounces/square foot, minimum yield of 50,000 psi.
E. Clip:
   1. 18 gauge UL - rated clip with two fasteners to structural (#UL-90 rated - Underwriters Laboratories).
F. Texture:
   1. Striations (# minimizes oil canning effect).
G. Finish:
   1. Premium fluorocarbon coating produced with Kynar-500 resin. (# 20 year warranty)
H. Color:
   1. Selected from manufacturer's standard offering.
I. Acceptable manufacturer:
   1. Metal Sales Manufacturing Corporation (800) 944-3786
J. Other acceptable manufacturers:
   1. AEP • Span, Dallas, TX
   2. Steelox Systems, Mason, OH
   3. CENTRIA
   4. Fabral
   5. MBCI
   6. McElroy
   7. Peterson

8. Una Clad

7412.2 Fabrication

A. Roll form panels in continuous lengths, full length of detailed runs. Fabricate trim, flashing and accessories as required.
B. Fabricate trim and flashing from same material as panel.

7413 PART 3 EXECUTION

7413.1 Examination

A. Inspect roof deck to verify deck is even, smooth, sound and free of depressions, waves or projections and properly sloped.

B. Installer shall examine all substrates on which work is to be applied. Any surface not suitable for application of metal panel system shall be conveyed to writing to the engineer.

7413.2 Installation

A. Install panels so that they are weathertight, without waves, warps, buckles, fastening, stresses or distortion, allow for expansion and contraction.

B. Install panels in accordance with manufacturer's installation instructions and shop drawings.

C. Provide concealed anchors at all panel attachment locations.

D. Install panels plumb, level, and straight with seams and ribs/battens parallel, conforming to design as indicated.

7413.3 Cleaning, Protection

A. Dispose of excess materials and remove debris from site.

B. Clean work in accordance with manufacturer's recommendations.

C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the Engineer, any work that becomes damaged prior to final acceptance.

D. Touch up minor scratches and abrasions.

END OF SECTION

SECTION 07530
EPDM SINGLE PLY ROOFING

07531 PART 1 – GENERAL

07531.1

A. Scope
1. EPDM is being bid as an alternate roof system (alternate 100-08 at Lincoln Elementary, alternate 200-5 at the HS/MS) in lieu of the base bid system which is Durolast.
2. See roof plan drawings for a further description of alternates.
3. See specification 07540 for any other pertinent information regarding the roof assembly.

07532 PART 2 – PRODUCT

07532.1

A. Manufacturer
1. The following EPDM manufacturers have been approved for this project. No substitutions by secondary, indirect manufacturers will be allowed:

a) Firestone
b) Carlisle

07533 PART 3 – EXECUTION

07533.1

A. Install EPDM single ply membrane in accordance with Manufacturers' written instructions.

END OF SECTION

SECTION 07540
DUROLAST SINGLE PLY ROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Adhered membrane roofing system.
2. Roof Insulation.
3. Prefabricated flashings, corners, parapets, stacks, vents, and related details
4. Fasteners, adhesives, and other accessories required for complete roof installation.
5. Traffic protection.

1.3 REFERENCES

A. UL: Underwriters Laboratories.
1. Roofing Materials and System Directory: TGFU.R10128.

B. FMG: Factory Mutual Global.
1. Factory Mutual Standard 4470 - *Approved Standard for Class 1 Roof Covers.*

C. ASTM: American Society of Testing and Materials.
1. ASTM C 578-04a, *Standard Specification For Rigid, Cellular Polystyrene Thermal Insulation*, © 2004, ASTM International.
2. ASTM C 1177/C1177M-04e1, *Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing*, © 2004 ,ASTM International.
3. ASTM C 1289-04, *Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board*, © 2004, ASTM International.
4. ASTM C 1396/C1396M-04, *Standard Specification for Gypsum Board*, © 2004, ASTM International.
5. ASTM D 146-04, *Standard Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing*, © 2004, ASTM International.
6. ASTM D 570-98, *Standard Test Method for Water Absorption of Plastics*, © 1998, ASTM International.
7. ASTM D 751-00e1, *Standard Test Methods for Coated Fabrics*, © 2000, ASTM International.
8. ASTM D 828-97(2002), *Standard Test Method for Tensile Properties of Paper and Paperboard Using Constant-Rate-of-Elongation Apparatus*, © 2002, ASTM International.
9. 9. ASTM D1079-05, *Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials*, © 2005, ASTM International.
10. ASTM D 1204-02, *Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature*, © 2002, ASTM International.

11. ASTM D 2136-02, *Standard Test Method for Coated Fabrics-Low-Temperature Bend Test*, © 2002, ASTM International.
12. ASTM D3045-03, *Standard Practice for Heat Aging of Plastics Without Load*, © 2003, ASTM International.
13. ASTM D 4434-96, *Standard Specification for Poly(Vinyl Chloride) Sheet Roofing*, © 1996, ASTM International.
14. ASTM D 5602-98, *Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens*, © 1998, ASTM International.
15. ASTM D 5635-04, *Standard Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens*, © 2004, ASTM International.
16. ASTM E 108-04, *Standard Test Methods for Fire Tests of Roof Coverings*, © 2004, ASTM International.
17. ASTM E 119-00a, *Standard Test Methods for Fire Tests of Building Construction and Materials*, © 2000, ASTM International.
18. ASTM G 154-00, *Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials*, © 2000, ASTM International.

1.4 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 and glossary of NRCA's *The NRCA Roofing and Waterproofing Manual* for definition of terms related to roofing work in this Section.

1.5 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

C. Physical Properties: Roof product must meet the requirements of type IV PVC sheet roofing as defined by ASTM D4434-96 and must meet or exceed the following physical properties.
1. Thickness: 40 mil (1.0 mm), nominal per ASTM D751.
2. Breaking Strengths: $\geq$430 lbf. (MD) and $\geq$368 lbf. (XMD) per ASTM D751, Grab Method.
3. Elongation at Break: $\geq$30% per ASTM D751, Grab Method.
5. Heat Aging per ASTM D3045: 176°F for 56 days. No sign of cracking, chipping or crazing. (per ASTM D4434).
4. Factory Seam Strength: $\geq$468 lbf per ASTM D751, Grab Method.
6. Tearing Strength: $\geq$91 lbf. (MD) and $\geq$128 lbf. (XMD) per ASTM D751, Procedure B.
7. Low Temperature Bend (Flexibility): Pass -40°F per ASTM D2136.
8. Accelerated Weathering: No cracking, checking, crazing, erosion or chalking after 5,000 hours per ASTM G154 (formerly G53).
9. Linear Dimensional Change: $\leq$0.5% per ASTM D1204 @176 ± 2°F for 6 hours.
10. Water Absorption: $\leq$3% per ASTM D570 @158°F for 166 hours.
11. Static Puncture Resistance: $\geq$56 lbs. per ASTM D5602.
12. Dynamic Puncture Resistance: $\geq$474 pdl-ft per ASTM D5635.

D. Minimum UL Class A fire rating.

E. Attach roofing system using the fastener spacing requirements in the current edition of the manufacturer's Specification.

F. Current International Code Council Evaluation Services Report or Legacy Report showing compliance with the International Building Code.

1.6 SUBMITTALS

A. Product data: For each component of the roofing system.

B. Shop Drawings: For roofing system. Include roof plan with fastening pattern, and roofing manufacturer's standard details that are representative of those that will be encountered during installation.

C. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

D. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in *Performance Requirements* Article.

E. ASTM D4434-96 Certification: Supply test results from qualified testing agency that states that the roofing product meets the requirements for type IV PVC sheet roofing as defined in ASTM D4434-96.

F. Maintenance Data: Outlining leak reporting procedure, maintenance requirements, and emergency repair procedures.

G. Warranties: Submit a current sample of the manufacturer's warranty that will be issued for this project.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer must utilize a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.

C. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

D. There shall be no deviations from roofing membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer.

E. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: ASTM E119, for fire-resistance-rated roof assemblies of which roofing system is a part.

F. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 1 Section *Project Management and Coordination.* Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
1. Meet with Owner, Engineer, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
5. Review governing regulations and requirements for insurance and certificates if applicable.
6. Review temporary protection requirements for roofing system during and after installation.
7. Review roof observation and repair procedures after roofing installation.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

C. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

E. Handle and store roof materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

2.0 WARRANTY

A. Contractor Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for two (2) years from the date of favorable inspection by the roof membrane manufacturer. Should any leaks covered under the warranty occur during this period, corrective action will be taken by the contractor to repair the roof to the satisfaction of the owner and the roof membrane manufacturer. All corrective work will be done at no cost to the owner or Duro-Last.

B. Manufacturer Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:
1. Warranty Period: 15 years from date issued.
2. No exclusions for damage caused by ponded water or biological growth, or for incidental or consequential damages.
3. Issued direct from and serviced by the roof membrane manufacturer.
4. Transferable for the full term of the warranty.
5. No additional charge for the warranty.
6. At Lincoln Elementary, the warranty may be modified to exclude any damage to the Durolast roof system caused by the existing phenolic insulation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Product: Subject to compliance with requirements, provide the product specified.
2. Manufacturer: Subject to compliance with requirements, provide products by the manufacturer specified.

2.2 PVC ROOFING MEMBRANE

A. PVC Sheet: ASTM D4434, Type IV, fabric reinforced, as follows:
1. Product: Subject to compliance with requirements, provide *Duro-Last® Specially Formulated Roofing Membrane* by Duro-Last Roofing, Inc.
2. Thickness: 40 mil (1.0 mm), nominal.
3. Exposed Face Color: white.

2.3 AUXILIARY MATERIALS

A. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet membrane.

B. Prefabricated Flashing: Prefabricated flashings for pipes, curbs, inside and outside corners of same material, type, reinforcement, and color as PVC sheet membrane.

C. Sealants and Adhesives: Caulk, pourable sealant, mastic and adhesives must be supplied by Duro-Last.

D. Slip Sheet and Cover Boards: Slip sheet or cover boards, of type required by Duro-Last for the application.

E. Termination Bars: Standard rigid exterior vinyl bar, 1.5-inch wide with slotted holes 6-inch on center must be manufactured by Duro-Last.

F. Edge Detail: Fascia bar and cover, prefabricated Drip Edge, prefabricated Gravel Stop and 2-Piece Compression Metal Edge must be manufactured by Duro-Last.

G. Vinyl Coated Metal: 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of manufacturers membrane laminated to one side.

H. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and supplied by Duro-Last.

2.4 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes.
1. Thickness: Subject to compliance with requirements, provide insulation with minimum thickness of 3-inch, unless noted otherwise on the drawings.
2. Insulation Attachment: Mechanical.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, felt or glass-fiber mat facer on both major surfaces.
1. Manufacturers
a. Apache Products Company.
b. Atlas Roofing Corporation.
c. Celotex Corporation.
d. Dow Chemical Company.
e. Hunter Panels.
f. Koppers, Inc.
g. R-Max, Inc.
h. U.S. Intec, Inc.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.5 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and supplied by Duro-Last.

2.6 Walkways

A. Flexible Walkways: Provide non-skid, maintenance-free walkway pads in areas of heavy foot traffic and around mechanical equipment as shown on the drawings. Walkway pads must be manufactured by Duro-Last.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
   1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
   2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thickness of insulation.
   3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to Duro-Last's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 INSULATION INSTALLATION

A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with Duro-Last's written instructions for installing roof insulation.

C. Install tapered insulation to conform to slopes indicated.

D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
   1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

F. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Follow Duro-Last specifications.
   1. Fasten insulation according to Duro-Last's specification.
   2. Fasteners and plates must be supplied by Duro-Last.

3.4 ADHERED ROOFING MEMBRANE INSTALLATION

A. Install prefabricated roofing sections over area to receive roofing according to Duro-Last's written instructions.
   1. Confirm that substrate is approved by Duro-Last to receive adhered membrane.

2. If membrane is to be adhered to a substrate board or an insulation board, confirm that the board is attached per Duro-Last's specification.
3. Apply adhesive within the temperature range and at application rates specified by Duro-Last.

B. Accurately align each prefabricated roofing section in order to maintain overlaps of the minimum dimensions required by Duro-Last.

C. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to Duro-Last's written instructions to ensure a watertight seam installation.
1. Hot-air welded seams must be a minimum of 1-1/2 inch wide.
2. After seam has cooled make a *hands and knees* inspection with a probe. Repair any deficiencies found immediately.

D. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

E. Penetrations: Utilize prefabricated flashings for penetrations such as pipes, equipment curbs, braces and pitch pockets. These flashings shall be made of the same membrane as the roof sections. Hot-air weld the flashing's skirt to the roofing section and properly terminate the flashing to the penetration per Duro-Last's specification.

F. Drains and Scuppers: Follow Duro-Last's specification to properly terminate the roofing sections at drains and scuppers. Clamping rings may be used to terminate the roof section at roof drains. If the drain does not have a clamping ring, or it cannot be used, a prefabricated drain boot must be used. Prefabricated flashings must be utilized for scuppers.

3.5 BASE FLASHING INSTALLATION

A. Install prefabricated sheet flashings according to Duro-Last's specification.

B. Utilize prefabricated flashings for roof penetrations.

C. Utilize prefabricated inside and outside corners where necessary.

D. Hot-air weld the flashing's skirt to the roofing section and properly terminate the flashing to the penetration per Duro-Last's specification.

3.6 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to roof membrane according to Duro-Last's specification.

3.7 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for Duro-Last's technical representative to inspect roofing installation on completion.
1. Deficiencies: Any deficiencies identified during the inspection will be corrected and made ready for reinspection within five (5) working days. Such corrections will be made at no expense to the Owner.

2. Warranty: Upon receipt of the required materials, certifying inspection and acceptance of the installation by Duro-Last, the warranty shall be duly executed and issued to the Owner.

3.8 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the Owner.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by Duro-Last.

END OF SECTION

SECTION 07900
JOINT SEALERS

7901 PART 1 GENERAL

7901.1 Section Includes

A. Preparing substrate surfaces.
B. Sealant and joint backing.

7901.2 Related Sections

A. Section 03300 - Cast-In-Place Concrete: Sealants required in conjunction with concrete.
B. Section 04200 - Unit Masonry System: Sealants required in conjunction with masonry.
C. Section 07240 – Exterior Insulated Finish System (EIFS): Sealants related in conjunction with finished systems.
D. Section 07410 - Standing Seam Sheet Metal Roofing: Sealants required in conjunction with metal flashing.
E. Section 07620 - Sheet Metal Flashing and Trim: Sealants required in conjunction with metal flashings.
F. Section 08100 - Hollow Metal Steel Frames: Sealants required in conjunction with door frames.
G. Section 08100 - Aluminum Windows: Sealants required in conjunction with aluminum windows.

7901.3 References

A. ASTM C790 - Use of Latex Sealing Compounds.
B. ASTM C804 - Use of Solvent-Release Type Sealants.
C. ASTM C834 - Latex Sealing Compounds.
D. ASTM C920 - Elastomeric Joint Sealants.
E. ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber.
F. ATM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers (Open-Cell Foam).
G. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

7901.4 Submittals

A. Submit under provisions of Section 01300.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Samples: Submit two (2) samples, 1/4” x 4” inch in size illustrating sealant colors for selection.

D. Manufacturer’s Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

7901.5 Quality Assurance

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

7901.6 Qualifications

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
B. Applicator: Company specializing in performing the work of this section with minimum three years experience and as approved by manufacturer.

7901.7 Environmental Requirements

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

7901.8 Warranty

A. Provide five year warranty under provisions of Section 01740.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

7902 PART 2 PRODUCTS

7902.1 Sealants

A. General
   1. Where the term "Acceptable Standard" is used within this Section, it refers to the manufacturer and product listed, which is specified as the type and quality required for this Project.

   2. Products of other manufacturers will be considered, providing their products equal or exceed the quality specified, and they can provide products of the type and quality required.

   3. Single source responsibility for joint sealer materials: Obtain joint sealer materials from a single manufacturer for each different product required

   4. Compatibility: Provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and final experience.

B. Acrylic Emulsion Latex Caulk: ASTM C834, Single component, gun grade, non-staining, non-bleeding, non-sagging; mildew resistant formulated to be paintable and recommended for exposed non-structural applications on interior locations

involving joint movement of less than 12 1/2 percent for joints 1/4 inch to 3/4 inch x 1/2 inch in size.

1. Acceptable Standards

    a. "Acrylic Latex 834", Tremco, Inc.
    b. Chem-Calk 600", Bostik Construction Products
    c. "Sonolac", Sonneborn-Chemrex Inc.
    d. "AC-20 + Silicone", Pecora Corporation

2. Caulking compound shall be used for interior non-moving joints and at specific locations indicated in the construction drawings.

C. Polyurethane Sealant (Type M): ASTM C920, Grade P, Class 25, Use; Interior floor joint applications; single component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging self-leveling type; 1 - color as selected by Engineer; manufactured by Pecora Corp, NR200 Urexpan or Eqoisia Lett.

1.	Elongation Capability	25% percent
2.	Service Temperature Range	180 degrees F
3.	Shore A Hardness Range	20 to 35

D. Silicone Sealant: ASTM C920, Grade NS, Class 25, Where thermal and/or dynamic movement is anticipated use single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding; color as selected by Engineer.

1. Acceptable Standards

    a. "Chem-Calk 1000", Bostik Construction Products.
    b. "Omni Seal", Sonneborne-Chemrex, Inc.
    c. "864 Silicone", Pecora Corporation.
    d. "Dow Corning 795", Dow Corning Corp.

2. One component elastomeric sealants shall be used at external and internal joints where thermal or dynamic movement is anticipated including, but not limited to, the following locations:

    a. Metal to metal joints.
    b. Sheet metal flashings, copings, performed metal caps, fascias, extenders, trim and panels.
    c. Glass to glass joints.
    d. Glass to metal joints.

E. Silicone Sealant (Type S): ASTM C920, single component, mildew resistant, fungus resistant, chemical curing, non-sagging, non-staining, non-bleeding; formulated for use in conjunction with plumbing fixtures, ceramic tile and other conditions where high humidity and humidity and temperature extremes are anticipated; color as selected by Engineer; manufactured by Dow Corning Company, Type 795 or equal.

1. Acceptable Standards

    a. "Dow Corning 786", Dow Corning Corp.
    b. "Rhodorsil 6B White", Rhone-Poulenc Inc.

c. SCS 1702 Sanitary" General Electric.

2. One part mildew resistant sealant shall be used around counter tops and for sealing backslashes and for other wet interior locations.

F. Multi-Part Epoxidized Elastomeric Polyurethane Terpolymer Sealant: ASTM C920 type M, Grade NS, Class 25. For watertight seals in building joints; color to be selected by the Engineer.

1. Acceptable Standards

a. "Dymeric", Tremco Inc.
b. "Chem-Calk 500", Bostik Construction Products
c. "Sonolastic NP 2", Sonneborne-Chemrex Inc.
d. "Dynatrol 2", Pecora Corporation.

2. Multi part elastomeric urethane sealants shall be used at exterior and interior joints were weatherproofing or waterproofing is required and at exterior joints between dissimilar materials including, but not limited to, the following locations:

a. Expansion and control joints
b. Exterior side of hollow metal frames to adjacent materials .
c. Lintels and shelf angles to masonry construction.
d. Louvers to adjacent construction.
e. Vertical and horizontal control joints and expansion joints in the building - interior and exterior sides.
f. Sealant in pipe sleeves where materials must perforate the floor slab.
g. Perimeter of floor slabs or concrete curbs which abut vertical surfaces.
h. Exterior joints between dissimilar materials where the joining of the two surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to make watertight.
i. Exterior locations which are noted "caulked" or sealant" and not specifically listed herein or included in the Work of other Sections of the Specifications.

7902.2 Accessories

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ASTM D1056; round, closed cell neoprene sponge rubber tube; oversized 30 to 50% percent larger than joint width; "Everlastic" as manufactured by Williams Products Inc.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

7903 PART 3 EXECUTION

7903.1 Examination

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

7903.2 Preparation

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions.

D. Protect elements surrounding the work of this section from damage or disfiguration.

7903.3 Installation

A. Install sealant in accordance with manufacturer's instruction.

B. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave or as detailed.

7903.4 Cleaning

A. Clean work under provisions of Section 010700 and 01710.

B. Clean adjacent soiled surfaces.

7903.5 Protection of Finished Work.

A. Protect finished installation under provisions of Section 01040.

B. Protect sealants until cured.

END OF SECTION

SECTION 08100

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following products manufactured in accordance with SDI Recommended Standards:

1. Doors: Seamless, hollow or composite construction standard steel doors for interior and exterior locations. (Indicated as Hollow Metal "HM" on the Door Schedules.)

2. Frames: Pressed steel frames for doors, transoms, sidelights, borrowed lights, mullions, interior glazed panels, and other interior and exterior openings of following type: (Indicated as Hollow Metal "HM" on the Door Schedules.):

a. Welded unit type.

3. Assemblies: Provide standard steel door and frame assemblies as required for the following:

a. Labeled and fire rated.

4. Provide factory primed doors and frames to be field painted.

B. The following sections contain requirements that relate to this Section:

1. Division 8 Section “Door Hardware” for door hardware.

2. Division 9 Section "Painting" for painting primed doors and frames.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections. Do not proceed with any fabrication until all details are approved.

B. Product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

C. Shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

2. Indicate coordinate of glazing frames and stops with glass and glazing requirements.

D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.

C. Hollow metal supplier will be a qualified direct distributor of products to be furnished. Supplier must have facilities within 100 miles of the project.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A Manufacturer: Subject to compliance with requirements, provide standard steel doors and f frames by one of the following:

1. Standard Steel Doors and Frames:

a. Ceco Door Co.
b. Curries Co.
c. Steelcraft Division
d. Republic
e. Daybar Industries, Limited
f. Opening Solutions Group

2.2 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A 569 and ASTM A 568.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

C. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames.

D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

E. Shop Applied Paint: Apply after fabrication.

1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 DOORS

A. Provide metal doors of SDI grades and models specified below or as indicated on drawings or schedules:

1. Interior Doors: ANSI/SDI-100, Grade II, heavy-duty, Level 3 or 4, minimum 18-gage cold-rolled sheet steel faces, except as follows:
   a. Doors indicated on the door schedule as “Hollow Metal Stiffened” shall be minimum 14 gage cold rolled sheet steel faces.

2. Exterior Doors (Thermally Insulated): SDI-100 Grade III Model 2, 16 galvanized, seamless, composite construction.

3. Doors shall have beveled (1/8" in 2") hinge and lock edge with edge seam welded and ground smooth. Furnish steel top and bottom caps. Maximum undercut of door will be 5/8” or less.

2.4 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled steel.

1. Fabricate frames with mitered, coped, or welded corners. **KD** frames will not be permitted.

2. Form exterior frames from 14-gage hot dipped A60 galvanized steel.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

C. Plaster Guards: Provide minimum 26-gage steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

D. Provide double temporary spreader bars to be removed before settting frames.

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.

1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.

2. Clearances: Not more than 1/8 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. Fabricate exterior doors, panels, and frames from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Finish Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.

1. For concealed hardware, provide space, cutouts, reinforcing and provisions for fastening in doors and frames, as applicable.

H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware to be done at project site.

I. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

J. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

K. Glazing Stops: Minimum 20 gage steel or .040-inch-thick aluminum.

1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.

2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," unless otherwise indicated.

1. Except for frames located at existing concrete, masonry or drywall installations, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry Tee anchors. Provide four (4) wall anchors per j jamb for frame over 7'-2" high.

3. Install fire-rated frames in accordance with NFPA Standard No. 80.

4. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.

5. At existing in-place drywall partitions install knock down slip-on drywall frames.

C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.

1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

SECTION 08200
ALUMINUM ENTRANCE DOORS

General

Acceptable manufacturers of aluminum windows must be the same for the storefront subject to compliance with specification requirements herein are: Tubelite Storefront and Wausau Windows, Traco windows and Kawneer Storefront, and YKK windows and YKK storefront. Window manufacturers to submit data on proposed equal product to specifications with test reports, product installations, matching finish guarantee between windows and storefront and product guarantee.

Description

Furnish all necessary materials, labor and equipment for the complete installation of aluminum entrance doors, door frames and hardware as shown on the drawings and specified herein.
Doors and frames shall be as manufactured by Tubelite Inc., Walker, Michigan.
Whenever substitute products are to be considered, supporting technical literature, samples, drawings and performance data must be submitted ten (10) days prior to bid in order to make a valid comparison of the products involved.
Test reports certified by an independent laboratory must be made available upon request.

Product
Materials -- Must be manufactured with an average of 80% recycled billet.

Doors to be Tubelite 1-3/4" thick, Medium Stile (4" top rail, 4" vertical rails and 10" bottom rail).

Note: Door hardware is specified in Section 08700, but is to be furnished and installed with this section.

Extrusions shall be of aluminum alloy 6063-T5 extruded within commercial tolerance and free from defects impairing strength and/or durability. Door stile and rail sections to be a minimum of .125 inch wall thickness. Door frame sections to be of .080 inch minimum wall thickness, with glazing and door moldings a minimum of .050 inch.
Steel tension rods of .375 inch diameter shall run the full width of the top and bottom rails and shall be fixed with steel plates and lock nuts.
Door glazing shall be by means of an interior and exterior fixed gasket of high quality extruded elastomeric material. Door frame members shall have a continuous wool pile/vinyl fin weatherstripping at the head and jamb members. Door stops shall be of snap-in design eliminating use of exposed screws.
All door and frame members shall be accurately fitted to flush hairline joints.

Finish

All exposed framing surfaces shall be free of scratches and other serious blemishes.

Finish to be: Tubelite Class I "DB" Dark Bronze Acid Etch Anodized.
Dark Bronze Anodize (DB)
Anodize process must consist of Eco-Friendly Acid Etch technology.

Warranty

2-year manufacturer.
2-year finish.

Execution
Installation

Shall be in accordance with the manufacturer's installation instructions and the approved shop drawings.

SECTION 08340
ROLLING COUNTER FIRE DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Manual automatic closing rolling counter fire doors.

1) There are three pass-thru window units at the HS/MS administration, shown on plan drawing 200-A2.3 and 200-A2.7. Also see wall Section 4 on drawing 200-A5.3. These shall be provided with rolling fire door protection.
2) The courtertop at this location shall be labeled, and is included with the specification section.

B. Related Sections:
1. 09110 – Metal Stud Framing
2. 16720 – Fire Alarm System. Connection of units to fire alarm system.

1.2 SYSTEM DESCRIPTION

Performance Requirements:

1. Provide doors with Underwriters' Laboratories, Inc. label for the fire rating classification, 1 hr.

1.3 SUBMITTALS

A. Submit the following items:
1. Product Data.
2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
3. Quality Assurance/Control Submittals:
a. Provide proof of manufacturer ISO 9001:2008 registration.
b. Provide proof of manufacturer and installer qualifications - see 1.4 below.
c. Provide manufacturer's installation instructions.
4. Closeout Submittals:
a. Operation and Maintenance Manual.
b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer Qualifications: ISO 9001:2008 registered and a minimum of five years experience in producing counter fire doors units of the type specified.
2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

A. Follow manufacturer's instructions.

1.6 WARRANTY

A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Cornell Iron Works, Inc., Crestwood Industrial Park, Mountaintop, PA 18707. Telephone: (800) 233-8366, Fax: (800) 526-0841. Underwriters Laboratories, Inc. (UL), ISO 9001:2008 Registered.

B. Model: ERC10

2.2 MATERIALS

A. Curtain:
1. Slats: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, 22 gauge ASTM A 653, Commercial Quality, galvanized steel with plain steel bottom bar and vinyl astragal.
2. Fabricate continuous interlocking slat sections with high strength galvanized steel endlocks riveted to slats per UL requirements.
3. Slat Finish:
a. GalvaNex™ Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex™ produces a superior finish against corrosion and abrasion. GalvaNex™ components include a limited two year finish warranty.
4. Bottom Bar Finish:
a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

B. Guides:
1. Steel: 12 gauge formed shapes.
2. Finish:
a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

C. Counterbalance Shaft Assembly:
1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

D. Brackets: Fabricate from reinforced steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
1. Finish:
a. Steel: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

E. Hood and mechanism covers: 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
1. Finish:
a. GalvaNex™ Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex™ produces a superior finish against corrosion and abrasion. GalvaNex™ components include a limited two year finish warranty.

F. Smoke Seals:
1. Bottom Bar: UL Tested PVC double bulb seal.
2. Guides and Head: Replaceable, UL Listed, nylon pile smoke seals sealing against fascia side of curtain.

2.3 ACCESSORIES

A. Locking:

PLASTIC LAMINATE COUNTERTOPS ARE AVAILABLE FOR OPENINGS UP TO 15’-0” (4.57M) WIDE. 12” (305 mm) MINIMUM SILL DEPTH; 36” (914mm) MAXIMUM SILL DEPTH.

B. Countertop: 1 ½ Hour UL Labeled, 1-5/8” (41 mm) thick, plastic laminate covered, size and configuration made for opening size and wall construction. Color as selected by Engineer from standard range of Wilson Art or Formica plastic laminates.

C. Photoelectric Smoke/Heat Detector: UL listed.

2.4 OPERATION

A. Manual M100 Crank Hoist: Provide combination hand crank/controlled closing system operator including removable hand crank, geared reduction unit and an electric wall mounted close control

station. Integral to the unit is a releasing device for connection to a central alarm system or local smoke detectors and a governor to control automatic closing speed.

Doors shall maintain an average closing speed of not more than 12" (305 mm) per second during automatic closing.
Resetting of spring tension or mechanical dropouts shall not be required.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

B. Comply with NFPA 80 and NFPA 105 and follow manufacturer's installation instructions.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 FIELD QUALITY CONTROL

A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.5 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

3.6 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.
END OF SECTION

SECTION 08350
ROLLING GRILLES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Manual overhead rolling grilles.
1) There are 3 units to furnish and install, identified as doors 319-1, 319-4 and 319-5 on the door schedule (drawing 200-A6.1). See also plan drawing 200-A2.3 and interior elevation 9 on drawing 200-A3.1.

B. Related Sections:
1. 09110 – Metal Stud Framing
2. 08700 Door Hardware. Masterkeyed cylinders.

1.2 SYSTEM DESCRIPTION

A. Design Requirements:
1. Cycle Life:
a. Design grilles of standard construction for normal use of up to 5 cycles per day maximum.

1.3 SUBMITTALS

A. Reference Section 01 33 00 Submittal Procedures; submit the following items:
1. Product Data.
2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
3. Quality Assurance/Control Submittals:
a. Provide proof of manufacturer and installer qualifications - see 1.3 below.
b. Provide manufacturer's installation instructions.
4. Closeout Submittals:
a. Operation and Maintenance Manual.
b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer Qualifications: Minimum of five years experience in producing grilles of the type specified.
2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

A. Follow manufacturer's instructions.

1.6 WARRANTY

A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Cornell Iron Works, Inc., Crestwood Industrial Park, Mountaintop, PA 18707. Telephone: (800) 233-8366, Fax: (800) 526-0841. Underwriters Laboratories, Inc. (UL), ISO 9001:2008 Registered.

B. Model: ESG10

2.2 MATERIALS

A. Curtain:
1. ESG10 Straight Pattern
a. Horizontal Rods: Solid 5/16 inch (8 mm) diameter, 5056 h32 Aluminum alloy.
1. Vertical Spacing: 2 inches (50.8 mm) on center.

b. Vertical Chains: Grommetted aluminum links, 3/4 inch (19 mm) wide, positioned by E-rings on 6 inch (152.4 mm) centers. Provide double E-rings on horizontal bars on both sides of end chains to retain curtain in guides.
2. Bottom Bar: 2 x 3-1/2 inch (50.8 x 88.9 mm) extruded aluminum tubular section reinforced with 3 x2 x 3/16 inch (76.2 x 50.8 x 4.76 mm) aluminum angle(s).

3. Finish:
a. Aluminum Curtain and Bottom Bar:
1. Curtain: Clear anodized.
2. Bottom Bar: Clear anodized.

B. Guides, Wall Mounted: Heavy duty extruded aluminum sections with snap-on cover to conceal fasteners and polypropylene pile runners on both sides of curtain. Provide aluminum mounting angle as required for face of wall installation.
1. Finish, Aluminum Guide Components:
a. Clear anodized.

C. Counterbalance Shaft Assembly:

1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of grille to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

D. Brackets: Fabricate from minimum 3/16 inch (4.76 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
1. Finish: Phosphate treatment followed by a light gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness.

E. Hood: 0.040 inch (1.016 mm) aluminum with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
1. Finish:
a. Aluminum: Clear anodized.

2.3 ACCESSORIES

A. Locking:
1. Manual Push-Up: Keyed cylinder locking into both jambs operable from both sides of curtain. Keying shall be a high security, system, coordinated with school's keying.

2.4 OPERATION

A. Manual Push-Up: Provide pole with hook.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

A. General: Install grille and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

B. Follow manufacturer's installation instructions.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust grilles for ease of operation, free from warp, twist, or distortion.

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 08440
ALUMINUM INTERIOR STOREFRONT

PART 1 – GENERAL

1) Acceptable manufacturers of aluminum windows must be the same for the storefront subject to compliance with specification requirements herein are: Tubelite Storefront and Wausau Windows, Traco windows and Kawneer Storefront, and YKK windows and YKK storefront. Window manufacturers to submit data on proposed equal product to specifications with test reports, product installations, matching finish guarantee between windows and storefront and product guarantee.
2) This Section applies to the interior vestibule at the High School/Middle School.

1.1 SUMMARY

A. Section Includes: This Section includes, but shall not be limited to, all necessary materials, labor, and equipment for the complete installation of aluminum storefront framing as shown on the Drawings and specified herein.
B. Tubelite E4500 interior storefront to be used at interior vestibule location at the High School/Middle School. Use 4-1/2" high sidelite base (E4534).

1.2 SYSTEM DESCRIPTION

A. General: Provide the manufacturer's aluminum storefront framing system, adapted to the application indicated, and modified as required to comply with performance requirements and materials specified, as demonstrated by testing the manufacturer's corresponding systems according to test methods indicated.
   1. Performance Requirements:

      a. Structural Performance: Shall be based on a maximum allowable deflection of L/175 of the span or 3/4 inch (19 mm) maximum. The system shall perform to those criteria under a wind load of __21___psf.

1.3 SUBMITTALS

A. General:
   1. Product Data: Submit product data showing material proposed.
   2. Shop Drawings: Submit shop drawings for each product and accessory required.

B. Quality Control Submittals:
   1. Design Data: Submit design calculations for the aluminum storefront framing system and the connections for attaching them to the structure.
   2. Test Reports: Submit two copies each, plus the number the Contractor wants returned, of tests.

C. Maintenance Manuals: Furnish complete maintenance manuals describing the materials, devices, and procedures to be followed in cleaning and maintaining the work.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable requirements of the laws, codes, ordinances, and regulations of Federal, State, and local authorities having jurisdiction. Obtain necessary approvals from such authorities.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Product specified is "4500 Series Flush Glaze," 1-3/4 inches (44 mm) by 4-1/2 inches (114 mm), as manufactured by Tubelite, Inc. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by listed manufacturers are acceptable. The Architect will be the sole judge of the basis of what is equivalent.
   1. Product shall be American-made.

2.2 MATERIALS

A. Materials:
   1. Extrusions shall be of aluminum alloy 6063-T5 extruded within commercial tolerance and free from defects impairing strength and/or durability. Main framing sections shall be of 0.075 inch (1.9 mm) minimum wall thickness and glazing stop moldings shall be of 0.060 inch (1.5 mm) thickness.
      a. Recycled Content: Provide manufacturer's proprietary product fabricated of aluminum with a recycled content of more than 80 percent ("Ecoluminum," Tubelite, Inc.).
   2. Screws, bolts, and other accessories shall be compatible with the aluminum under normal service conditions.
   3. Glazing shall be by means of an exterior and interior roll-in wedge of high quality extruded elastomeric material.
   4. Provide ¼" tempered glass, installed in accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.

2.3 FABRICATION

A. Carefully fit and match work with continuity of line and design. Rigidly secure members with hairline joints, unless otherwise indicated. Reinforce members and joints for rigidity and strength as needed to fulfill performance requirements.
   1. Conceal fasteners unless otherwise indicated.
   2. Separate dissimilar materials with a heavy coating of epoxy paint or other suitable permanent separation as required to prevent galvanic action.

2.4 FINISHES

A. General: Comply with NAAMM MFM for recommendations relative to application and designation of finishes. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

B. Aluminum Finishes ("Eco-Efficient"):
   a. Class I "DB" Dark Bronze Anodized Finish: AA-M10-C21-A44 complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
   1. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.

3.2 PREPARATION

A. Coordinate and furnish anchors, concrete inserts, sleeves, anchor bolts, etc., that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project site.

3.3 INSTALLATION

A. General: Installation shall be in accordance with reviewed product data, final shop drawings, the manufacturer's specifications and recommendations, and as indicated on the Drawings.
   1. Erection Tolerances: Comply with manufacturer's published instructions.

Warranty:
1. 2-Year Manufacturers Warranty.
2. 2-Year Finish Warranty.

3.4 ADJUSTING AND CLEANING

A. Touch-Up Painting: Immediately after installation, touch-up scratched, nicked, abraded, chipped, or otherwise damaged areas of the finish so as to be unnoticeable.

B. Cleaning: Wash to remove any deleterious material from finished surfaces immediately.

3.5 DEMONSTRATION

A. Maintenance Instructions: Instruct the Owner's personnel who will be responsible for maintaining the work after the time of final acceptance.

3.6 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to the Installer, that shall ensure that the aluminum storefront framing shall be without damage at time of Substantial Completion.

END OF SECTION

SECTION 08450
ALUMINUM EXTERIOR STOREFRONT

General

Acceptable manufacturers of aluminum windows must be the same for the storefront subject to compliance with specification requirements herein are: Tubelite Storefront and Wausau Windows, Traco windows and Kawneer Storefront, and YKK windows and YKK storefront. Window manufacturers to submit data on proposed equal product to specifications with test reports, product installations, matching finish guarantee between windows and storefront and product guarantee.

Description

1) Furnish all necessary materials, labor and equipment for the complete installation of aluminum framing for the High School/Middle School as shown on the drawings and specified herein.

Fixed window framing shall be 14000 Series Flush Glaze (2" x 4 1/2") as manufactured by Tubelite Inc., Walker, Michigan. Whenever substitute products are to be considered, supporting technical literature, samples drawings and performance data must be submitted ten (10) days prior to bid in order to make a valid comparison of the products involved.

Test reports certified by an independent laboratory must be made available upon request.

2) This Section applies to the exterior of the High School/Middle School – including the small courtyard.

Performance Requirements

Air infiltration shall not exceed .06 CFM/Ft^2 when tested in accordance with ASTM E-283 at a test pressure of 6.24 PSF.

There shall be no uncontrolled water entry when tested in accordance with ASTM E-331 "Water Penetration of Exterior Windows, Curtainwalls and Doors by Uniform Static Air Pressure Difference" at a test pressure of 12 PSF.

There shall be no uncontrolled water entry when tested in accordance with AAMA 501.1-94 at a dynamic pressure equivalent of 12 PSF.

Structural performance per ASTM E330 shall be based on a maximum allowable deflection of L/175 of the span or 0.37" vertically and 0.25” horizontally maximum. The system shall perform to those criteria under a wind load as specified for this project. maximum. The system shall perform to those criteria under a wind load of __21__ PSF.

There shall be no buckling, stress on glass, edge seal failure, excess stress on curtainwall structure, anchors and fasteners or reduction in performance when tested in accordance with AAMA 501.5-98 at a temperature range of 0^0 to 180^0 F.

There shall be no "Life/Safety" type failures (glass breakage, anchor failures, or structural damage) when tested in accordance with AAMA 501.4, seismic test (lateral cycling.)

Thermal transmittance due to conduction (U_C) shall not be greater than .60 - poured & debridged only (or .63 - slotted only) BTU/Hr/Ft^2/F degree when tested in accordance with AAMA 1503-98. Condensation Resistance Factor (CRF) shall not be less than 53 for slotted materials when tested in accordance with AAMA 1503-98.

The system shall have a Sound Transmission Class (STC) rating of 32 and an Outdoor-Indoor Transmission Class (OITC) rating of 26 when tested in accordance with ASTM E90-97, ASTM E413-87 (reapproved 1994) and ASTM E1332-90.

Products
Materials -- Must be manufactured with an average of 80% recycled billet.

Tubelite 4-1/2" Sidelite base (T14047) to be used at sidelite base areas.

Tubelite thermally broken extruded sill flashing must be used (T14259).

Extrusions shall be of aluminum alloy 6063-T5 extruded within commercial tolerance and free from defects impairing strength and/or durability. Main framing sections to be of .075 inch minimum wall thickness and glazing stop moldings of .060 inch thickness.

Screws, bolts and all other accessories to be compatible with the aluminum under normal service conditions.

Glazing shall be by means of an exterior and interior roll-in wedge of high quality extruded EPDM material.

Glass

1) Sealed insulated glass shall be tested and certified in accord with ASTM E2190;
2) Provide 1" insulating glass with a makeup of ¼" clear glass 1/2" air space ¼" clear glass. Provide low e on #2 surface. Low e shall be PPG solar ban 60 or equal by Guardian or Viracon.
3) All glass shall be tempered.

Glazing

1) Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type or as approved by the glass fabricator.

Finish

All exposed framing surfaces shall be free of scratches and other serious blemishes.

Finish to be: Tubelite Class I "DB" Dark Bronze Anodized Anodized.

Anodizing process must consist of Eco-Friendly Acid Etch technology.

Warranty

2-year manufacturer.
2-year finish.

Execution
Installation

Shall be in accordance with the manufacturer's installation instructions and the

approved shop drawings.

SECTION 08500
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. **All exterior Architectural Performance Class (AW) windows furnished and installed as shown on Lincoln Elementary drawings, specified in this section and designated in AAMA/WDMA/CSA 101/I.S.2/A440.**
   2. All labor, materials, tools, equipment and services needed to furnish and install AW Class windows.
   3. Components furnished with installed windows.
   4. Installation accessories furnished and installed.

1.02 REFERENCE

A. Refer to AAMA/WDMA/CSA 101/I.S.2/A440 for a complete list of references and industry standards.

1.03 SYSTEM DESCRIPTION AND PERFORMANCE REQUIREMENTS

A. Design Wind Loads
   1. The design wind pressure for the project will be:
      a. 20 psf positive and negative

   2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.03.B.

B. Air, Water and Structural Performance Requirements
   1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 100 (AW100) unless otherwise noted herein.
      a. Test units shall not be smaller in either width or height than the “Gateway Test Size” specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
      b. “Downsize” testing to meet Optional Performance Class requirements specified herein shall not be permitted.
      c. Test units shall employ manufacturer’s standard sealing, lock spacing and anchorage.
   2. Air Test Performance Requirements
      a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.
   3. Water Test Performance Requirements
      a. No uncontrolled water leakage at 15.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547. Complete successful Category 10 pulsed pressure differential testing at 14 psf to 42 psf, with water application rate of 5 gallons/hr/sq ft when tested in accord with ASTM 2268 and AAMA 520.
   4. Structural Test Performance Requirements
      a. Uniform Load Deflection Test
         i. No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 100 psf (design test pressure) when tested in accord with ASTM E330.
      b. Uniform Load Structural Test
         i. Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.
         ii. No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

C. Life Cycle Testing
   1. When tested in accordance with AAMA 910, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.
      a. Air infiltration and water resistance tests shall meet the primary performance requirements specified after completion of cycling.

D. Condensation Resistance and Thermal Transmittance Performance Requirements.
   1. Perform thermal tests in accordance with NFRC 102 and AAMA 1503, or provide finite element computer thermal modeling and calculations per NFRC 100 or AAMA 507, using DOE/LBL THERM 5.2 and WINDOW 5.2 software.
      a. Thermal Transmittance (U-Factor) for the overall window area shall be less than or equal to .45 BTU/hr-ft^2-°F.
      b. Condensation Resistance Factor (CRF) requirements: CRF minimum 58 (Frame) and CRF minimum 65 (Glass).

c. Solar Heat Gain Coefficient (SHGC) for the overall window area shall not exceed .45.

1.04 SUBMITTALS

A. General Requirements
1. Provide all submittals in a timely manner to meet the required construction completion schedule.

B. Shop Drawings
1. Shop drawings must be prepared wholly by the window manufacturer, or a qualified engineering services firm under the direction of the manufacturer. Shop drawings for pre-engineered configurations may be prepared by authorized installers.
2. Provide design details along with bid proposals to define system aesthetic and functional characteristics.
3. Provide up to three photocopied sets of shop drawings, including half size details of all necessary conditions.

C. Samples
1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
2. Finish: Submit color samples for Architect's approval as requested.

D. Test Reports and Calculations
1. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.03.
2. Submit structural calculations prepared by a Registered Professional Engineer indicating adequacy of all materials furnished under this section, to meet the uniform and structural load requirements as specified in 1.03.

1.05 QUALITY ASSURANCE

A. Qualifications: Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.

B. In-Plant Testing: Conduct detailed quality audits and ASTM E331 static water infiltration testing on a minimum of 4% of factory-glazed windows prior to shipping, subject to reasonable unit size restrictions.
1. Each tested unit shall be identified with a removable sticker on the inside glass face.
2. Provide detailed documentation of in-plant testing upon request.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading
1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.07 WARRANTY

A. Aluminum Window Warranty
1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

B. Installation: Submit a written warranty, executed by the window installer, for a period of 1 year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer
1. Drawings and specification are based on:
a. Wausau Window and Wall Systems – 2250i INvent™ Series Fixed, Projected and/or Casement Windows.
b. Traco
c. YKK.
d. Do to this product being placed next another product (Storefront) the intention is to make sure the finishes match. One supplier must handle this specification and the storefront specification such as Wausau/Tubelite, Traco/Kawneer, or YKK storefront/YKK insert vents.
2. No Substitutions

2.02 MATERIALS

A. Aluminum Framing Members
1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
3. Principal window frame and sash ventilator members will be a minimum 0.125" in thickness at hardware mounting locations.
4. Extruded or formed trim components will be a minimum 0.060" in thickness.
5. Frame depth 2 ½ " maximum.
6. Sash ventilator sections must be tubular, and close flush with adjoining frame surfaces at interior and exterior.
   a. Overlap sash ventilators will not be accepted.

2.03 COMPONENTS

A. Hardware
1. All steel components including attachment fasteners to be stainless steel except as noted.
2. Extruded aluminum components 6063-T5 or -T6.
3. Locking handles, bases and strikes to be die cast, white bronze or stainless steel.
4. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.
5. Hardware to be occupant-operated.

B. Sealants
1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass

1. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.
2. Provide 1" insulating glass with a makeup of ¼" clear glass ½" air space ¼" clear glass. Provide low e on #2 surface. Low e shall be PPG solar ban 60 or equal by Guardian or Viracon.
3. All glass shall be tempered.

D. Glazing
1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
2. Provide windows factory-glazed.

E. Glazing Materials
1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Steel Components
1. Provide steel reinforcements as necessary to meet the performance requirements of 1.03.
2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with TGIC powder coating, or rust-inhibitive primer complying with Federal Specification TT-P-645B.

G. Receptors:
1. Provide extruded aluminum receptors to receive windows, at the head and sill of the windows.
2. Finish to match window frames.
3. Provide Receptors at the sill and head of the window system

2.04 FABRICATION

A. General:
1. Finish, fabricate and shop assemble frame and sash ventilator members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings shall impair independent frame movement, or bridge the thermal barrier, unless such bridging was also present in thermal test units and thermal models.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 °F to +180 °F.

B. Frames:
   1. Cope and mechanically fasten each corner, or miter then mechanically stake over a solid extruded aluminum corner block or weld each corner; then seal weather tight.
   2. Make provisions for continuity of frame joinery seals at extrusion webs.

C. Main Sash Ventilator
   1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy, leaving hairline joinery, then sealed weather tight.
   2. Make provisions for continuity of sash ventilator joinery seals at extrusion webs.

D. Hardware:
   1. Concealed Hinges
      a. Provide two stainless steel concealed four-bar adjustable friction hinges per vent meeting AAMA 904.1.
   2. Locks
      a. Die cast, lacquered or e-coated white bronze, or stainless steel cam locks, strikes and/or keepers for manual operation shall secure sash in closed position.
      b. Provide locks for ventilators at maximum 40" spacing; 50” for single operator multi-lock hardware.
      c. Provide double grip hardware activated by a lower device for locks exceeding 6'-0" from floor.
   3. Exposed Hinges
      a. Provide two (2) five-knuckle aluminum nylon-bushed hinges with coated stainless steel pins.
      b. Provide three (3) hinges on units over 4'-0" high.
      c. Finish of extruded aluminum hinge leaves and covers shall match window finish.
   4. Egress Provisions and Egress Hardware
      a. Make provisions for egress in case of emergency at windows as indicated on drawings.
      b. Affix aluminum egress tags to windows indicated.
      c.

E. Thermal Break Construction:
   1. Continuous extruded polyamide with 25% glass fiber reinforcing, mechanically crimped into cross-knurled cavities.
   2. Minimum thermal separation ¼".
   3. Quality assurance records must be maintained and available as requested.

F. Weather-stripping:
   1. Bulb- or fin-type neoprene, EPDM, dual-durometer PVC, polypropylene, TPE, or other suitable material as tested and approved by the window manufacturer.
   2. Miter, crowd, stake or join at corners. Provide drainage to exterior as necessary.
   3. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

2.05 FINISHES

A. Finish of Aluminum Components
   1. Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown.
   2.

Designation	Description	Standard	Color
AAM10C21A44	Electrolytically Deposited Class I Eco-friendly etch	AAMA 611	Dark Bronze

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions
   1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
   2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows
   1. Install all windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
   2. Vent windows must be installed, and remain, plumb, square and level, to one-half of the unit shimming tolerances cited in the AAMA Commercial Window and Door Installation Manual, for proper weathering and operation. Installer to make necessary final hardware adjustments on site.

3. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material.

SECTION 08510
ALUMINUM WINDOWS WITH STOREFRONT FRAMING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. **All exterior Architectural Performance Class (AW) insert windows furnished and installed as shown on drawings. These insert vents are only located at the large courtyard of the High School/Middle School. North elevation to have Integral blinds and triple glazing (see specification Section 08520); east, west and south elevations are not to have blinds or access panels, only an insulating glass unit.**
   2. All labor, materials, tools, equipment and services needed to furnish and install AW Class windows, supported by, and integral with, curtainwall and/or window wall.
   3. Components furnished with installed windows.
   4. Installation accessories furnished and installed.

1.02 REFERENCE

A. Refer to AAMA/WDMA/CSA 101/I.S.2/A440 for a complete list of references and industry standards.

1.03 SYSTEM DESCRIPTION AND PERFORMANCE REQUIREMENTS

A. Design Wind Loads
   1. The design wind pressure for the project will be:
      a. 20 psf positive and negative

   2. All structural components, including meeting rails, mullions and anchors shall be designed accordingly, complying with deflection and stress requirements of Paragraph 1.03.B.

B. Air, Water and Structural Performance Requirements
   1. When tested in accordance with cited test procedures, windows shall meet or exceed the following performance criteria, as well as those indicated in AAMA/WDMA/CSA 101/I.S.2/A440 for Architectural AW Performance Class windows, Performance Grade 70 (AW70) unless otherwise noted herein.
      a. Test units shall not be smaller in either width or height than the “Gateway Test Size” specified in AAMA/WDMA/CSA 101/I.S.2/A440 for AW Performance Class.
      b. “Downsize” testing to meet Optional Performance Class requirements specified herein shall not be permitted.
      c. Test units shall employ manufacturer’s standard sealing, lock spacing and anchorage.
   2. Air Test Performance Requirements
      a. Air infiltration maximum 0.1 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.
   3. Water Test Performance Requirements
      a. No uncontrolled water leakage at 12.00 psf static pressure differential, with water application rate of 5 gallons/hr/sq ft when tested in accord with both ASTM E331 and ASTM E547.
   4. Structural Test Performance Requirements
      a. Uniform Load Deflection Test
         i. No deflection of any unsupported span L of test unit (framing rails, muntins, mullions, etc.) in excess of L/175 at both a positive and negative load of 70 psf (design test pressure) when tested in accord with ASTM E330.
      b. Uniform Load Structural Test
         i. Unit to be tested at 1.5 x design test pressure, both positive and negative, acting normal to plane of wall in accord with ASTM E330.
         ii. No glass breakage; permanent damage to fasteners, hardware parts, or anchors; damage to make windows inoperable; or permanent deformation of any main frame or ventilator member in excess of 0.2% of its clear span.

C. Life Cycle Testing
   1. When tested in accordance with AAMA 910, there is to be no damage to fasteners, hardware parts, support arms, activating mechanisms or any other damage that would cause the window to be inoperable at the conclusion of testing.
      a. Air infiltration and water resistance tests shall meet the primary performance requirements specified after completion of cycling.
D. Condensation Resistance and Thermal Transmittance Performance Requirements
   1. Perform thermal tests in accordance with NFRC 102 and AAMA 1503, or provide finite element computer thermal modeling and calculations per NFRC 100 or AAMA 507, using DOE/LBL THERM 5.2 and WINDOW 5.2 software.
      a. Thermal Transmittance (U-Factor) for the overall window area shall be less than or equal to .50 BTU/hr-ft^2-°F.
      b. Condensation Resistance Factor (CRF) requirements: CRF minimum 48 (Frame) and CRF minimum 76 (Glass).
      c. Solar Heat Gain Coefficient (SHGC) for the overall window area shall not exceed .45.

1.04 SUBMITTALS

A. General Requirements
   1. Provide all submittals in a timely manner to meet the required construction completion schedule.

B. Shop Drawings
   1. Shop drawings must be prepared wholly by the window manufacturer or may be prepared by authorized installers.
   2. Provide design details along with bid proposals to define system aesthetic and functional characteristics.
   3. Provide up to three photocopied sets of shop drawings, including half size details of all necessary conditions.

C. Samples
   1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
   2. Finish: Submit color samples for Architect's approval as requested.

D. Test Reports and Calculations
   1. Submit certified independent laboratory test reports verifying compliance with all test requirements of 1.03.
   2. Submit structural calculations prepared by a Registered Professional Engineer indicating adequacy of all materials furnished under this section, to meet the uniform and structural load requirements as specified in 1.03.

1.05 QUALITY ASSURANCE

A. Qualifications: Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.

B. In-Plant Testing: Conduct detailed quality audits and ASTM E331 static water infiltration testing on a minimum of 4% of factory-glazed windows prior to shipping, subject to reasonable unit size restrictions.
   1. Each tested unit shall be identified with a removable sticker on the inside glass face.
   2. Provide detailed documentation of in-plant testing upon request.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading
   1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.07 WARRANTY

A. Aluminum Window Warranty
   1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
   2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer’s option.
   3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

B. Installation: Submit a written warranty, executed by the window installer, for a period of 1 year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
   1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer’s option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer
   1. Drawings and specification are based on:
      a. Wausau Window and Wall Systems - 2250 Series Projected and/or Casement Insert Vents.
      b. Traco
      c. Ykk
      d. Do to this product being placed into another product (Storefront) the intention is to make sure the finishes match. One supplier must handle this specification and the storefront specification such as Wausau/Tubelite, Traco/Kawneer, or YKK storefront/YKK insert vents.
   2. No Substitutions

2.02 MATERIALS

A. Aluminum Framing Members

1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
3. Principal window frame and sash ventilator members will be a minimum 0.125" in thickness at glazing legs, hardware mounting webs and section flanges.
4. Extruded or formed trim components will be a minimum 0.060" in thickness.
5. Frame depth 2 ½ " minimum. Frame profile shall be glazed into the storefront system.
6. Sash ventilator sections must be tubular, and close flush with adjoining frame surfaces at interior and exterior.
   a. Overlap sash ventilators will not be accepted.

2.03 COMPONENTS

A. Hardware
1. All steel components including attachment fasteners to be 300 Series stainless steel except as noted.
2. Extruded aluminum components 6063-T5 or -T6.
3. Locking handles, bases and strikes to be die cast, white bronze or stainless steel.
4. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.

B. Sealants
1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass
1. Sealed insulated glass shall be tested and certified in accord with ASTM E2190.
2. Provide 1" insulating glass with a makeup of ¼" clear glass ½" air space ¼" clear glass. Provide low e on #2 surface. Low e shall be PPG solar ban 60 or equal by Guardian or Viracon.
3. All glass shall be tempered.

D. Glazing
1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.
2. Provide units factory glazed.

E. Glazing Materials
1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Steel Components
1. Provide steel reinforcements as necessary to meet the performance requirements of 1.03.
2. Concealed steel anchors and reinforcing shall be factory painted after fabrication with TGIC powder coating complying with UL 1332, or rust-inhibitive primer complying with Federal Specification TT-P-645B.

2.04 FABRICATION

A. General:
1. Finish, fabricate and shop assemble frame and sash ventilator members into complete windows under the responsibility of one manufacturer.
2. No bolts, screws or fastenings shall impair independent frame movement, or bridge the thermal barrier, unless such bridging was also present in thermal test units and thermal models.
3. Fabricate to allow for thermal movement of materials when subjected to a temperature differential from -30 °F to +180 °F.

B. Frames:
1. Cope and mechanically fasten each corner, or miter and weld each corner; then seal weather tight.
2. Make provisions for continuity of frame joinery seals at extrusion webs.

C. Main Sash Ventilator
1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy, leaving hairline joinery, then sealed weather tight.
2. Make provisions for continuity of sash ventilator joinery seals at extrusion webs.

D. Hardware:
   1. Concealed Hinges
      a. Provide two stainless steel concealed four-bar adjustable friction hinges per vent meeting AAMA 904.1.
   2. Locks
      a. Die cast, e-coated white bronze, or stainless steel cam locks, strikes and/or keepers for manual operation shall secure sash in closed position.
      b. Provide locks for ventilators at maximum 40" spacing.
      c. Provide double grip hardware activated by a lower device for locks exceeding 6'-0" from floor.
   3. Exposed Hinges
      a. Provide two (2) five-knuckle aluminum nylon-bushed hinges with e-coated stainless steel pins.
      b. Provide three (3) hinges on units over 4'-0" high.
      c. Finish of extruded aluminum hinge leaves and covers shall match window finish.
   4. Egress Provisions and Egress Hardware
      a. Make provisions for egress in case of emergency at windows as indicated on drawings.
      b. Affix aluminum egress tags to windows indicated.

E. Thermal Break Construction
   1. Frame and sash members must include a thermal break applied in the manufacturer's facility, using concealed low conductance poured-in-place polyurethane. Polyurethane at all members must be poured into pre-finished and mechanically pre-treated cavities.
   2. After proper curing, the aluminum bridge section must be removed to provide a nominal ¼" separation between exterior and interior metal surfaces.
   3. Quality assurance records must be maintained and available as requested.

F. Weather-stripping:
   1. Bulb- or fin-type neoprene, EPDM, dual-durometer PVC, polypropylene, TPE, or other suitable material as tested and approved by the window manufacturer.
   2. Miter, crowd, stake or join at corners. Provide drainage to exterior as necessary.
   3. Weather-stripping shall provide an effective pressure-equalization seal at the interior face of the sash ventilator.

2.05 FINISHES

A. Finish of Aluminum Components
   1. Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown.

Designation	Description	Standard	Color
AAM10C21A44	Electrolytically Deposited Class I Eco-friendly etch	AAMA 611	Dark Bronze

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions
   1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, calculations and contract documents.
   2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows
   1. Install windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
   2. Windows must be installed plumb, square and level for proper weathering and operation.
   3. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material.

SECTION 08520
STOREFRONT STORM WINDOWS WITH INTEGRAL BLINDS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

B. This specification includes blinded access panels that insert into the storefront. Framing applies only at the North Elevation of the large High School Courtyard.

1. All interior prime windows furnished and installed as shown on drawings, specified in this section and designated in AAMA/WDMA/CSA 101/I.S.2/A440.
2. All labor, materials, tools, equipment and services needed to furnish and install interior prime windows for sound, energy, air and/or light control enhancement of existing weather tight windows.
3. Components furnished with installed interior windows.
4. Installation accessories furnished and installed.

1.02 REFERENCE

A. Refer to AAMA/WDMA/CSA 101/I.S.2/A440 for a complete list of references and industry standards.

1.03 SYSTEM DESCRIPTION AND PERFORMANCE REQUIREMENTS

A. Air Infiltration/Exfiltration Performance Requirements:
1. When tested in accordance with cited test procedures, and with all purposeful vent holes plugged, windows shall meet or exceed the following performance criteria.
2. Air infiltration and exfiltration maximum 0.3 cfm per square foot at 6.24 psf pressure differential when tested in accord with ASTM E283.

1.04 SUBMITTALS

A. General Requirements
1. Provide all submittals in a timely manner to meet the required construction completion schedule.

B. Shop Drawings
1. Shop drawings must be prepared either by the manufacturer or by authorized installers.
2. Provide up to three photocopied sets of shop drawings, including half size details of all necessary conditions.

C. Samples
1. Components: Submit samples of anchors, fasteners, hardware, assembled corner sections and other materials and components as requested by Architect.
2. Finish: Submit color samples for Architect's approval as requested.

1.05 QUALITY ASSURANCE

A. Qualifications: Upon request, the window manufacturer shall provide written confirmation that the installer is authorized to install window products to be used on this project.

1.06 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading
1. Materials will be packed, loaded, shipped, unloaded, stored and protected in accordance with AAMA CW-10.

1.07 WARRANTY

A. Aluminum Window Warranty
1. Products: Submit a written warranty, executed by the window manufacturer, for a period of 10 years from the date of manufacture, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements and industry standards, which result in premature failure of the windows, finish, factory-glazed glass, or parts, outside of normal wear.
2. In the event that windows or components are found defective, manufacturer will repair or provide replacements without charge at manufacturer's option.
3. Warranty for all components must be direct from the manufacturer (non pass-through) and non pro-rated for the entire term. Warranty must be assignable to the non-residential owner, and transferable to subsequent owners through its length.

B. Installation: Submit a written warranty, executed by the window installer, for a period of 1 year from the date of substantial completion, against defective materials or workmanship, including substantial non-compliance with applicable specification requirements, which result in premature failure.
   1. In the event that installation of windows or components is found to be defective, installer will repair or provide replacements without charge at the installer's option.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer
   1. Drawings and specification are based on:
      a. Wausau Window and Wall Systems - 1297 S.E.A.L.™ Series Interior Prime Windows.
      b. Traco
      c. YKK
      d. Do to this product being placed into another product (Storefront) the intention is to make sure the finishes match. One supplier must handle this specification and the storefront specification such as Wausau/Tubelite, Traco/Kawneer, or YKK storefront/YKK insert vents.
   2. No Substitutions

2.02 MATERIALS

A. Aluminum Framing Members
   1. Extruded aluminum billet, 6063-T5 or T6 alloy for primary components; 6063-T5 or T6, 6005-T5, 6105-T5 or 6061-T6 for structural components; all meeting the requirements of ASTM B221.
   2. Aluminum sheet alloy 5005-H32 (for anodic finishing), or alloy 3003-H14 (for painted or unfinished sheet) meeting the requirements of ASTM B209.
   3. Principal window frame and access panel members will be a minimum 0.093" in thickness at glazing legs, hardware mounting webs and section flanges.
   4. Extruded or formed trim components will be a minimum 0.060" in thickness.
   5. Frame depth 1 ¼ " minimum.
   6. Access panel sections must close flush with adjoining frame surfaces at interior and exterior.
      a. Overlap access panels will not be accepted.

2.03 COMPONENTS

A. Hardware
   1. All steel components including attachment fasteners to be 300 Series stainless steel except as noted.
   2. Extruded aluminum components 6063-T5 or -T6.
   3. Locking handles, bases and strikes to be die cast, white bronze or stainless steel.
   4. Thermo-plastic or thermo-set plastic caps, housings and other components to be injection-molded nylon, extruded PVC, or other suitable compound.

B. Sealants
   1. All sealants shall comply with applicable provisions of AAMA 800 and/or Federal Specifications FS-TT-001 and 002 Series.
   2. Frame joinery sealants shall be suitable for application specified and as tested and approved by window manufacturer.

C. Glass
   1. Provide ¼" clear tempered glass. 1/8" or 3/16" residential thickness glass is not allowed.

D. Glazing
   1. Glazing method shall be in general accordance with the GANA Glazing Manual for specified glass type, or as approved by the glass fabricator.

E. Glazing Materials
   1. Setting Blocks/Edge Blocking: Provide in sizes and locations recommended by GANA Glazing Manual. Setting blocks used in conjunction with soft-coat low-e glass shall be silicone.
   2. Back-bedding tapes, expanded cellular glazing tapes, toe beads, heel beads and cap beads shall meet the requirements of applicable specifications cited in AAMA 800.
   3. Glazing gaskets shall be non-shrinking, weather-resistant, and compatible with all materials in contact.
   4. Structural silicone sealant where used shall meet the requirements of ASTM C1184.
   5. Spacer tape in continuous contact with structural silicone shall be tested for compatibility and approved by the sealant manufacturer for the intended application.
   6. Gaskets in continuous contact with structural silicone shall be extruded silicone or compatible material.

F. Glazed Access Panel:
   1. Hinged access panel provided with Allen locks for custodial operation.
   2. Finish to match window frames.

G. Integral Venetian Blinds:
   1. 5/8" wide aluminum slat blinds. Blind color shall be selected by architect from manufacturers full range of standard colors.
   2. Blind to be integrally mounted between the dual glazing.
   3. Tilt-control knob will be located on the operable face and incorporate a "slip clutch" feature.
   4. Raise and lower pull cords will be located between glass for access only when glazed access panel is opened.

2.04 FABRICATION

A. General:
   1. Finish, fabricate and shop assemble frame and access panel members into complete windows under the responsibility of one manufacturer.

B. Frames:
   1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy; or miter and weld each corner.

C. Interior Operable Panel
   1. Miter all corners and mechanically stake over a solid extruded aluminum corner block, set and sealed in epoxy, leaving hairline joinery.

D. Hardware:
   1. Concealed Hinges
      a. Provide two die cast concealed hinge pins, retained in injection molded nylon hinge blocks at sill and spring steel hinge clips at head.
   2. Locks
      a. Die cast or stainless steel Allen-keyed locks for custodial operation shall secure panel in closed position. Provide locks at maximum 40" spacing.

E. Weather-stripping:
   1. Bulb- or fin-type neoprene, EPDM, dual-durometer PVC, polypropylene, TPE, or other suitable material as approved by the window manufacturer.
   2. Miter, crowd, stake or join at corners.

2.05 FINISHES

A. Finish of Aluminum Components
   1. Finish of all exposed areas of aluminum windows and components shall be done in accord with the appropriate AAMA Voluntary Guide Specification shown.

Designation	Description	Standard	Color
AAM10C21A44	Electrolytically Deposited Class I Eco-friendly etch	AAMA 611	Dark Bronze

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions
   1. Verify that building substrates permit installation of windows according to the manufacturer's instructions, approved shop drawings, and contract documents.
   2. Do not install windows until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Erection of Aluminum Windows
   1. Install windows with skilled workers in accordance with approved shop drawings, installation instructions, specifications, and the AAMA Commercial Window and Door Installation Manual.
   2. Windows must be installed plumb, square and level for proper operation.
   3. Aluminum that is not organically coated shall be insulated from direct contact with steel, masonry, concrete or other dissimilar metals by bituminous paint, rust-inhibiting primer, non-conductive shims or other suitable insulating material, if exposure to moisture will occur at any point during construction or occupancy.

SECTION 08700

DOOR HARDWARE

PART 1 GENERAL

1.1 Refer to "General and Special Conditions", and "Instructions to Bidders", Division 1 of Specifications. Requirements of these Sections and the project drawings shall govern work in this section.

1.2 Work Included:

A. Furnish all items of Finish Hardware specified, scheduled, shown or required herein except those items specifically excluded from this section of the specification.

B. Aluminum Doors: Hardware is specified in this section, but is to be furnished and installed by the aluminum door and window contractor.

1.3 Quality Assurance

A. Requirements of Regulatory Agencies:

1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.
2. Furnish finish hardware to comply with the requirements of the regulations for public building accommodations for physically handicapped persons of the governmental authority having jurisdiction and to comply with Americans with Disabilities Act.
3. Provide hardware for fire-rated openings in compliance with NFPA 80 and state and local building code requirements. Provide only hardware that has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.

B. Hardware Supplier:

1. Shall be an established firm dealing in contract builders' hardware. He must have adequate inventory, qualified personnel on staff and be located within 100 miles of the project. The distributor must be a factory-authorized dealer for all materials required. The supplier shall be or have in employment an Architectural Hardware Consultant (AHC).

C. Pre-installation Meeting:

1. Before hardware installation, General Contractor/Construction Manager will request a hardware installation meeting be conducted on the installation of

hardware; specifically that of locksets, closers, exit devices, overhead stops and coordinators. The hardware supplier for the project shall conduct the meeting. Meeting to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Meeting to address proper coordination and installation of hardware, per finish hardware schedule for this specific project, by using installation manuals, hardware schedule, templates, physical product samples and installation videos.

2. When any electrical or pneumatic hardware is specified this meeting shall also include the following trades/installers: Electrical, Security, Alarm systems and Engineer.
3. Convene one week or more prior to commencing work of this Section.
4. The Hardware Supplier shall include the cost of this meeting in his proposal.

D. Manufacturer:

1. Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.

1.4 Submittals:

A. Hardware Schedule

1. Submit number of Hardware Schedules as directed in Division 1.
2. Follow guidelines established in Door & Hardware Institute Handbook (DHI) Sequence and Format for the Hardware Schedule unless noted otherwise.
3. Schedule will include the following:
   a. Door Index including opening numbers and the assigned Finish Hardware set.
   b. Preface sheet listing category only and manufacturer's names of items being furnished as follows:

CATEGORY	SPECIFIED	SCHEDULED
Hinges	Manufacturer A	Manufacturer B
Lock sets	Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z

   c. Hardware Locations: Refer to Article 3.1 B.2 Locations.
   d. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, door material, frame material, and UL listing.
   e. Hardware Description: Quantity, category, product number, fasteners, and finish.
   f. Headings that refer to the specified Hardware Set Numbers.
   g. Scheduling Sequence shown in Hardware Sets.
   h. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
   i. Electrified Hardware system operation description.
   j. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved."

k. Typed Copy, hand written will not be permitted
l. Double-Spacing.
m. 8-1/2 x 11 inch sheets
n. U.S. Standard Finish symbols or BHMA Finish symbols.

B. Product Data:

1. Submit, in booklet form Manufacturers Catalog cut sheets of scheduled hardware.
2. Submit product data with hardware schedule.

C. Key Schedule:

1. Submit detailed schedule indicating clearly how the Owner's final keying instructions have been followed.
2. Submit as a separate schedule, must be signed by the owner.

1.5 Product Delivery, Storage, and Handling:

A. Label each item of hardware with the appropriate door number and Hardware Schedule heading number, and deliver to the installer so designated by the contractor.

1.6 Warranties:

A. Refer to Division 1 for warranty requirements.

B. During the warranty period, replace defective work, including labor, materials and other costs incidental to the work. Replace work found to be defective as defined in the General Conditions.

PART 2 - PRODUCT

2.1 Furnish each category with the products of only one manufacturer unless specified otherwise; this requirement is mandatory whether various manufacturers are listed or not.

2.2 Provide the products of manufacturer designated or if more than one manufacturer is listed, the comparable product of one of the other manufacturers listed. Where only one manufacturer or product is listed, it is understood that this is the owner’s Building Standard and "no substitution" is allowed.

A. Hinges:

1. Furnish hinges of class and size as listed in sets.

2. Products of a BHMA member are acceptable.

B. Continuous Gear Hinge:

1. 6063-T6 aluminum alloy, anodized finish (cap on entire hinge painted if specified). Manufacture to template, uncut hinges non-handed, pinless assembly, three interlocking extrusions, full height of door and frame, lubricated polyacetal thrust bearing, fasteners 410 stainless steel plated and hardened. All hinge profiles to be manufactured to template bearing locations, with standard duty bearing configurations at 5-1/8" spacing with a minimum of 16 bearings: and heavy duty at 2-9/16" spacing with a minimum of 32 bearings. Anodizing of material shall be done after fabrication of components so that all bearing slots are anodized.
2. Length: 1" less than door opening height. Fastener 12-24 x 1/2" #3 Phillips keen form stainless steel self-tapping at aluminum and hollow metal doors, 12- 1/2" #3 Philips, flathead full thread at wood doors.
3. Furnish fire rated hinges "FR" at labeled openings.
4. Numbers used are Select Products, Ltd.

C. Flush Bolts:

1. Constant Latching: metal doors:
   a. IR-Ives FB50 Series
   b. Equal product of any B.H.M.A. member.
2. Constant Latching: wood doors:
   a. IR-Ives FB60 Series
   b. Equal product of any B.H.M.A. member.
3. Manual – wood and metal doors:
   a. IR-Ives FB458 Series
   b. Equal product of any B.H.M.A. member.
4. Dust Proof Strikes - furnish with all flush bolts, except at openings having thresholds:
   a. IR-Ives DP2
   b. Equal product of any B.H.M.A. member.

D. Locksets and Latchsets - Mortise Type:

1. Locksets shall be manufactured from heavy gauge steel, minimum lockcase thickness 1/8", containing components of steel with a zinc dichromate plating for corrosion resistance.
2. Locks are to have a standard 2 ¾" backset with a full ¾" throw two-piece stainless steel mechanical anti-friction latchbolt. Deadbolt shall be a full 1" throw, constructed of stainless steel.
3. Lockcase shall be easily handed without chassis disassembly by removing handing screw on lockcase and installing in opposite location on reverse side. Changing of door hand bevel from standard to reverse hand shall be done by removing the lockcase scalp plate, and pulling and rotating the latchbolt 180 degrees.

4. Lock trim shall be through-bolted to the door to assure correct alignment and proper operation. Lever trim shall have external spring cage mechanism to assist in support of the lever weight.
5. Provide strikes with extended lips where required to protect trim from being marred by latch bolt. Provide strike lips that do not project more than 1/8" beyond door frame trim at single doors and have 7/8" lip to center at pairs of 1-3/4" doors.

E. Exit Devices:

1. Exit devices shall be touchpad style, fabricated of brass, bronze, stainless steel, or aluminum, plated to the standard architectural finishes to match the balance of the door hardware.
2. All exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. Touchpad shall extend a minimum of one half of the door width. All latchbolts to be deadlatching type, with a self-lubricating coating to reduce wear.
3. End-cap will be sloped to deflect any impact from carts and they shall be flush with the external mechanism case. End caps that overlap and project above the mechanism case are unacceptable. End cap shall utilize a two-point attachment to the mounting bracket.
4. Touchpad shall match exit device finish, and shall be stainless steel for US26, US26D, US28, US32, and US32D finishes. Only compression springs will be used in devices, latches, and outside trims or controls.
5. Plastic templates shall be included with each exit device to facilitate a quick, easy and accurate installation.
6. Strikes shall be roller type and come complete with a locking plate to prevent movement.
7. All rim and vertical rod exit devices shall have passed a 5 million(5,000,000) cycle test based on ANSI A156.3, 1994, Grade 1 test standards and certified by an independent testing lab.
8. All mortise exit devices shall have passed a 10 million(10,000,000)cycle test based on ANSI A156.3, 1994, Grade 1 test standards and certified by an independent testing lab.
9. Provide cylinder dogging on panic exit hardware where noted in hardware sets.
10. Exit devices shall be UL listed panic exit hardware. All exit devices for fire rated openings shall be UL labeled fire exit hardware.
11. Lever trim for exit devices shall be vandal-resistant type, which will travel to a 90-degree down position when more than 35 pounds of torque are applied, and which can easily be re-set.
12. Trim:
    a. As specified in sets.
    b. Levers to match lockset design where specified.

F. Coordinator – Frame Stop Mounted:

1. Door coordinator shall prevent the active door from closing before inactive door. Stop mounted channel 1-5/8" x 5/8" steel tubing x length to suit door opening. Coordinator shall be UL listed. Furnish filler bars to fill gap between end of coordinator and inactive door frame. Furnish mounting brackets for all stop mounted hardware such as exit device strikes, door closer PA shoes, etc.

Coordinators shall be prepared (cutout) at the factory for surface applied or concealed vertical rod panic devices if required.

2. Furnish with carry bar CB1 when required for proper operation.
   a. IR-Ives COR x length to suit.
   b. Equal products of any BHMA manufacturer

G. Coordinator – Frame Face Mounted, Gravity Type:

1. Door coordinator shall prevent the active door from closing before inactive door by means of a gravity action arm and roller, adjustable on-site. Coordinator shall have all-brass construction. When used on labeled fire doors, coordinators shall have UL listing.
2. When inactive leaf can be opened before the active leaf, provide with carry bar CB1.
3. Manufacturers:
   a. IR-Ives COR7G/9G
   b. Equal products of any BHMA manufacturer

H. Closers:

1. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1 ½" in diameter, and double heat treated pinion shall be 11/16" in diameter with double D slab drive arm connection.
2. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to –30 degrees F.
3. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
4. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
5. All surface mounted mechanical closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory.
6. Closers will have Powder coating finish certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
7. Refer to door and frame details and furnish accessories such as drop plates, panel adapters, spacers and supports as required to correctly install door closers. State degree of door swing in the hardware schedule.

I. Overhead Holders and Stops:

1. Type, function and fasteners must be same as Glynn-Johnson specified. Size per manufacturer's selector chart. Plastic end caps, hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.
2. Manufacture products using base material of Brass/Bronze for US3, US4, & US10B finished products and 300 Stainless Steel for US32 & US32D finished products.

J. Kick Plates:

1. Furnish .050 inches thick 10" high x door width less 2" at single doors and less 1" at pairs. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less 2".
2. Any BHMA manufacturing product meeting above is acceptable.

K. Bumpers:

1. Wrought, forged, or cast, approximately 2-1/2 inch diameter, convex or concave rubber center, concealed fasteners.
   a. IR-Ives WS407CCV
   b. BHMA L02101.

L. Wall Stops:

1. Length to exceed projection of all other hardware. Provide with threaded studs and expansion shields for masonry wall construction. Install with slope at top.
   a. IR-Ives WS33
   b. BHMA L12011 or L12021

M. Thresholds:

1. 1/2" high - 5" wide. Cope at jambs.
2. Furnish full wall opening width when frames are recessed.
3. Cope in front of mullions if thresholds project beyond door faces.
4. Furnish with non-ferrous Stainless Steel Screws and Lead Anchors.
   a. National Guard as listed in sets
   b. Equal of Zero or Reese

N. Door Sweeps:

1. Surface Sweeps:
   a. National Guard as listed in sets
   b. Equal by Zero or Reese

O. Weather-stripping:

1. Apply to head and jamb stops.
2. Solid Bar stock all sides
   a. National Guard as listed in sets
   b. Equal by Zero or Reese

P. Meeting Stile Weather-stripping:

1. 2 Pc. Nylon brush type to seal gap between pairs of doors.
   a. National Guard as listed in sets
   b. Equal by Zero or Reese

Q. Alternate Suppliers:
1. Lock Alternates
   a. Must be grade 1 with free wheeling (Vandal Resistant) lever feature
   b. Schlage
   c. Sargent
   d. Corbin Russwin
   e. Yale
2. Exit/panic Hardware Alternates
   a. Must be grade 1, lever trim must have free wheeling capability.
   b. Sargent
   c. Corbin Russwin
   d. Yale
   e. Detex
   f. Precision
3. Hinge Alternates
   a. Hagar
   b. McKinney
   c. Ives
4. Continuous Hinge Alternates
   a. Hagar
   b. Markar
   c. Ives
5. All other hardware alternates must be of equivalent or better quality.

R. Miscellaneous:

1. Furnish items not categorized in the above descriptions but specified by manufacturer's names in Hardware Sets.

S. Fasteners:

1. Furnish fasteners of the proper type, size, quantity and finish. Use machine screws and expansion shields for attaching hardware to concrete or masonry, and wall grip inserts at hollow wall construction. Furnish machine screws for attachment to reinforced hollow metal doors and frames and reinforced aluminum doors and frames. Furnish full thread wood screws for attachment to solid wood doors and frames. "TEK" type screws are not acceptable.
2. Sex bolts will not be permitted on reinforced metal doors or wood doors where blocking is specified.

2.3 Finishes:

A. Generally, Dull Chrome, US26D / BHMA 626. Provide finish for each item as indicated in sets.

2.4 Templates and Hardware Location:

A. Furnish hardware made to template. Supply required templates and hardware locations to the door and frame manufacturers.

B. Furnish metal template to frame/door supplier for continuous hinge.

C. Refer to Article 3.1 B.2, Locations, and coordinate with templates.

2.5 Cylinders and Keying:

A. All cylinders for this project will be supplied by one supplier regardless of door type and location.

B. The Finish Hardware supplier will meet with Engineer and/or Owner to finalize keying requirements and obtain keying instructions in writing including the delivery of final keys and cores.
   1. Supplier shall include the cost of this service in his proposal.

C. Equip all locks and cylinders with restricted, patent protected, interchangeable core cylinders with nickel silver blocking pin to check for patented feature on keys. Provide a minimum of six pins with nickel silver bottom pins. Cylinders must allow for multiplex master keying, combinated to Owner's instructions.

D. Deliver all permanent keys, key blanks and other security keys as determined in keying meeting.

E. Key Material: Provide manufacturer's standard embossed keys of nickel silver to ensure durability. Furnish keys in the following quantities:
   a. 2 each Control Keys.
   b. 2 each Grand Master Keys.
   c. 10 each Master keys per master group.
   d. 2 each Keys per cylinder.

PART 3 - EXECUTION

3.1 Installation

A. General:

1. Install hardware according to manufacturers installations and template dimensions. Attach all items of finish hardware to doors, frames, walls, etc. with fasteners furnished and required by the manufacture of the item.
2. Provide blocking/reinforcement for all wall mounted Hardware.

3. Reinforced hollow metal doors and frames and reinforced aluminum door and frames will be drilled and tapped for machine screws.
4. Solid wood doors and frames: full thread wood screws. Drill pilot holes before inserting screws.
5. Continuous gear hinges attached to hollow metal doors and frames and aluminum doors and frames: 12-24 x 1/2" #3 Phillips Keenform self-tapping. Use #13 or 3/16 drill for pilot.
6. Continuous Gear Hinges require continuous mortar guards of foam or cardboard 1/2" thick x frame height, applied with construction adhesive.
7. Install weather-strip gasket prior to parallel arm closer bracket, rim exit device or any stop mounted hardware. Gasket to provide a continuous seal around perimeter of door opening. Allow for gasket when installing finish hardware. Door closers will require special templating. Exit devices will require adjustment in backset.

B. Locations:

1. Dimensions are from finish floor to center line of items.

2. Include this list in Hardware Schedule.

CATEGORY	DIMENSION
Hinges	Door Manufacturer's Standard
Flush Bolt Levers	72" and 12"
Levers	Door Manufacturer's Standard
Exit Device Touchbar	Per Template
Deadlatch Cylinder	43" unless conflicting with push-pull.
Deadlock MS Cylinder	43" unless conflicting with push-pull.
Hospital Push-Pull	Manufacturer's Template
Roller Latch	At Head
Push-Pull Units	42" to centerline of Pull
Offset Pulls	Suitable for Exit Devices
Pulls - Flush Cup	46"
Pulls (BTB)	46"
Push-Pulls	46"
Push Plates	52"
Pull Plates	42"
Wire Pulls	42"
Wall Stops/Holders	At Head
Astragals	Pull side of active leaf
Trim Protector Bars	Push side of door below lever handle
Lock Protectors	Pull side of door

C. Final Adjustment:

1. Provide the services of a representative to inspect material furnished and its installation and adjustment, to make final hardware adjustment, and to instruct the Owner's personnel in adjustment, care and maintenance of hardware.

2. Locksets, closers and exit devices shall be inspected by the factory representative and adjusted after installation and after the HVAC system is in operation, to insure correct installation and proper adjustment in operation. The manufacturer's representative shall prepare a written report stating compliance, and also recording locations and kinds of noncompliance. The original report shall be forwarded to the Engineer with copies to the Contractor, hardware installer and building owner.

D. Technical and Warranty Information:

1. At the completion of the project, the technical and warranty information coalesced and kept on file by the General Contractor/Construction Manager shall be given to the Owner or Owner's Agent. In addition to both the technical and warranty information, all factory order acknowledgement numbers supplied to the General Contractor/Construction Manager during the construction period shall be given to the Owner or Owner's Agent. The warranty information and factory order acknowledgement numbers shall serve to both expedite and properly execute any warranty work that may be required on the various hardware items supplied on the project.
2. Submit to General Contractor/Construction Manager, two copies each of parts and service manuals and two each of any special installation or adjustment tools. Include for locksets, exit devices, door closers and any electrical products.

3.2 Listing of doors for each hardware set for Project #1 – Lincoln Elementary:

Set A
Classroom intruder mortise leverset/Closer
101-1
101-2
102-1
103-1
104-1
105-1
105-2
106-1
107-1
108-1
108-4
109-1
110-1
111-1
111-2
112-1
113-1
113-2
114-1
115-1
116-1
117-1
118-1

119-1
120-1
121-1
122-1
123-1
124-1
125-1
139-1
140-1
142-1
144-1
323-1

Set B
I/C Mortise Housing
101-4
101-5
106-2
107-2
108-3
111-3
113-4
113-5
118-3
119-3
120-3
121-3
122-3
123-3
129-3
129-4
145-1
150-1
155-1
COR-2 Include 2 additional units as spares

Set C
Classroom mortise leverset/Closer
136-1
151-1

Set D
Passage mortise
102-2
103-2
104-2
105-3
108-2
109-2
110-2

111-4
112-2
114-2
116-2
117-2
118-2
119-2
120-2
121-2
122-2
123-2
139-2
323-2
323-3

Set E
I/C Mortise Housing/Closer
137-1
138-1
146-1
148-1
149-1
152-1
158-1
159-1
163-1

Set F
Privacy mortise leverset/Closer
147-1

Set G
Not Used

Set H
Classroom leverset/Adapter plates for thin door
160-1

Set I
Classroom leverset/Door Wrap/Closer
161-1

Set J
Exit Device with blank pull trim/Closers
143-1
143-2

Set K
Push/pull trim/Closer
134-1
135-1

Set L
Rim Exit Device with lever trim/Removable Mullion
129-1
129-2
EX-11

Set M
Rim Exit Device with pull trim/Closer/Continuous Hinges/Weather strip/Sweep/Threshold/Electric Strike where noted
EX-3 (Existing Electric Strike)
EX-5 (New Electric Strike)
EX-6

Set N
Classroon Function Mortise Leverset/Closer/Hinges/Weather strip/Sweep
EX-4

Set O
Rim Exit Devices/Closer/Hinges/Weather strip/Sweeps/Electric Strike
EX-9

Set P
Classroom Mortise Lock
115-2
153-1
154-1
154-2
162-1
324-1

Set Q
Rim I/C Housing
EX-2
Include 2 additional units as spares

Set R
Rim Exit Device/Pull Handles/Closer/Hinges/Weather strip/Sweep/Threshold/Mullion/Electric Strike where noted
EX-7
EX-8 (New Electric Strike)

Set S
Rim Exit Device with pull trim/Closer/Hinges/Weather strip/Sweep/Threshold/Mullion
EX-1

Set T
Mag Lock/Passive Infrared Sensor/Emergency Exit Button/I/C Mortise Housing
EX-10

3.3 Hardware Sets for Project #1 – Lincoln Elementary

Set A
35- Marks Classroom Intruder Mortise Lockset Part # 5CL92GG/26DG1
35- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set B
22- KSP Mortise Housing Part # 407X26D

Set C
2- Marks Classroom Mortise Lockset Part # 5CL92J/26DG1
2- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set D
21-Marks Passage Mortise Lockset Part # 5CL92N/26D

Set E
9- KSP Mortise Housing Part # 407x26D
9- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set F
1- Marks Privacy Mortise lockset Part # 5CL92L/26D
1- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set G – Not Used

Set H
1- Marks Passage Leverset Part # 195N/26D
1- Don Jo Thin Door Adapter Plates Part # AR335 630

Set I
1- Marks Classroom Leverset Part # 195RS/26D
1- Don Jo Door Wrap Part # CW 4S2
1- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set J
1- Von Duprin Rim Exit Devices Part # 99NL26D
1- Von Duprin Rim Exit Devices Part # 99DT26D
1- I/C Rim Cylinder Housings
2- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set K
2- Rockwood Pull Plates Part # 106 70C32D
2- Rockwood Push Plates Part # 70C32D
2- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set L
4- Von Duprin Rim Exit Devices Part # 99L06F26D 3FT
2-Von Duprin Rim Exit Device Part # 99EO
3- Detex Removable Mullions Part # 90KR
3- I/C Core Mortise Housings
Fill in old holes or any cosmetic defects from old hardware

Set M
2-Von Duprin Rim Exit Devices Part # 99NL26D
4-Von Duprin Rim Exit Devices Part # 99DT26D
6- I/C Rim Cylinder Housings
2-HES Rim Strikes Part # 9600 630
6- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM
3-Select Continuous Hinges Part # SL57HD Clear
3- NGP seals-Part #A626A
3- NGP Thresholds-Part # 513 Length per door opening
6- NGP nylon brush door sweeps-Part # 601A
Fill in old holes or any cosmetic defects from old hardware

Set N
1- Marks Classroom Mortise Lockset Part # 5CL92J/26DG1
1- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM
6- PBB Hinges Part # BB81 4.5 x4.5 26D
1- NGP seals-Part #A626A
2- NGP nylon brush door sweeps-Part # 601A
Set O
1-Von Duprin Rim Exit Devices Part # 99NL26D
1- Von Duprin Rim Exit Devices Part # 99DT26D
2- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM
1-HES Rim Strike Part # 9600 630
6- PBB Hinges Part # BB81 4.5 x4.5 26D
1- NGP seals-Part #A626A
2- NGP nylon brush door sweeps-Part # 601A
Fill in old holes or any cosmetic defects from old hardware

Set P
6- Marks Classroom Mortise Lockset Part # 5CL92J/26DG1

Set Q
3-KSP Rim Mortise Housing Part # 308 26D

Set R
4- Duprin Rim Exit Devices Part # 99EO313
1- I/C Rim Cyl. Housing
4-Don Jo Pull Handles Part # 1151 613 powder coated with concealed fasteners
1-HES Rim Strike Part # 9600 630
2-Fixed Alum Mullions Duro
4- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT ALUM
2- NGP seals-Part #A626A
2- NGP Thresholds-Part # 513 Length per door opening
2- NGP nylon brush door sweeps-Part # 601A
4-Select Continuous Hinges Part # SL57HD Duro

Set S
1- Duprin Rim Exit Devices Part # 99NL313
1- Duprin Rim Exit Devices Part # 99DT313
1- I/C Rim Cylinder Housings
1-HES Rim Strike Part # 9600 630
1-Fixed Alum Mullion Duro
2- LCN 4041XP Extreme Duty Door Closer Part # 4041XP RW/PA TBSRT DRKBR
1- NGP seals-Part #A626A
1- NGP Thresholds-Part # 513 Length per door opening
1- NGP nylon brush door sweeps-Part # 601A
2-Select Continuous Hinges Part # SL57HD Duro

Set T
1-Securtitron Mag Lock Part #MM15
1-Securtitron Exit Button Part # EEB2
1-Securitron PIR Part # XMS
1-KSP Mortise Housing Part # 407 10B Standard cam
Wire mold to be used to run low voltage for cosmetic appearances

3.4 Listing of doors for each hardware set for Project #2– High School/Middle School:

Set A
Classroom Security Mortise Lock/Hinges/Closer
103-1
201-1
202-1
203-1
204-1
205-1
206-1
207-1
210-2
301-1
302-1
304-1
304-2
305-1

306-1
307-1
309-2
317-1
320-1
321-1

Set B
Classroom Mortise Lock/Hinges
102-3
104-1
107-1
108-1
117-3
119-7
128-1
128-2
129-1
133-1
134-1
301-5
301-8
301-9
308-1
309-1
319-3
403
404
409

Set C
Classroom Mortise
143-1
146-1
220-2
221-1
301-6
301-7
320-4

Set D
Mortise Housing
102-2
104-2
105-1
106-1
109-1
111-1
111-2
112-1
113-1
114-1
115-1
116-8
117-2
117-4
117-6
117-10
119-2
119-3
124-2
133-2
133-3
135-1
139-1
143-2
211-2
211-3
213-2
213-3
301-3
301-4
301-10
301-11
301-12
301-13
310-3
319-2
319-4
320-3
406
407
EX-1

Set E
Classroom Security Mortise
208-1
209-1
210-1
211-1
212-1
213-1
214-1
215-1
220-1
310-1
310-2
311-1
312-1
313-1
314-1

Set F
Classroom Mortise lock/Hinges/Hold Open Closer
315-1

Set G
Classroom Security Leverset
216-1
217-1
218-1
219-1

Set H
Classroom Leverset/Wrap
413

Set I
Classroom Deadbolt
148-1
149-1
223-1
224-1
225-1
226-1

Set J
I/C Mortise Housing/Hold Open Closer
126-1
141-1
141-2
150-1
151-1
306-2
307A-1
326-1

Set K
I/C Mortise Housing/Closer
116-7
227-1
231-1
306-3
307-2
316-1

Set L
Leverset Privacy/Hinges
411

Set M
Leverset Passage
401
408

Set N
Mortise Passage/Hinges
119-6

Set O
Closer
115-2

Set P
Mortise Deadbolt
116-10

Set Q
Rim Housing
117-5
119-4
119-5

Set R
Classroom Deadbolt/Pushplate/Pull Handle/Closer/Hinges
120-1
122-1
123-1
229-1
230-1

Set S
Mortise deadbolt/Pull handle
132-1
140-1

Set T
Classroom Security Leverset/Hinges
200-1
228-1
228-2

Set U
Institution Leverset
212-2

Set V
Institution Mortise Lock
210-3
214-2
308-2

Set W
Mortise Deadbolt/Pull Handle/Closer
318-1

Set X
Classroom Deadbolt/push/pull plates/Closer/Continuous Hinge
322-1
323-1

Set Y
Classroom Mortise/Flushbolts/Hinges
324-1

Set Z
Electronic hold open closer/I/C Rim Housings
COR-1
COR-2
COR-3

Set AA
Classroom Security Mortise Lockset/Closer/Hinges/Wall stop
102-1

Set AB
Rim Exit Device/Removable Mullion/Hold Open Closers/Hinges
116-1
116-2

Set AC
Classroom Mortise Lock/Hinges/Closer
116-5
117-1
325-1

Set AD
Mortise Deadbolt/Hinges/Closer/Push/Pull Plates/Kick Plate
119-1

Set AE
Classroom Leverset/Occupancy Deadbolt/Hinges/Closer
121-1
122-1

Set AF
Rim Exit Device/Push Plate/Closer
124-3

Set AG
Hold Open Closer/Seals/Sweeps/Dummy Rim Cylinder
124-1

Set AH
Rim Exit Device/Closers/Removable Mullion/Hinges/Kick Plate
141-4

Set AI
Mortise Deadbolt/Pull Plate/Flush Bolts/Hold Open Closers/Continuous Hinges
142-1

Set AJ
Continuous Hinge/Dummy Rim Cylinder/Hold Open Closer
301-2

Set AK
Storeroom Mortise/Closer/Flushbolts/Hinges/Sweeps/Seals/Threshold
316-2

Set AL
Storeroom Mortise/Sweeps/Seals
EX-2
EX-14

Set AM
Closers
EX-13

Set AN
Rim Exit Devices/Closers/Continuous Hinges/Electric Strike
EX-7

Set AO
Storeroom Mortise/Continuous Hinge
EX-8

Set AP
Classroom Leverset
222-2
402
410

Set AQ
Institution Mortise/Closer/Seals/Sweeps/Threshold
EX-10
EX-11

Set AR
Rim Exit Device/Closer/Seals/Sweep/Threshold/Continuous Hinge
EX-41

Set AS
Closer/Seals/Sweep/Threshold/Continuous Hinge
EX-42

Set AT
Rim Exit Device/Electric Strike/Closer/Sweep/Seals/Threshold/Continuous Hinge
EX-40
EX-43
EX-45

Set AU
Rim Exit Device/Closer/Seals/Sweep/Threshold/Removable Mullion/Continuous Hinge
EX-44

Set AV
Rim Exit Device/Pull Handles/Closer/Sweep/Threshold/Mullion/Continuous Hinge/Electric Strike where noted.
125-1
101-1 (Electric Strike)
101-2

Set AW
Rim Exit Devices/Pull Handles/Closers/Continuous Hinges/Electric Strike where noted.
101-3 (Electric Strike)
101-4

Set AX
Rim Exit Device/Closer/Threshold/Sweep/Continuous Hinge
302-2

Set AY
Set not to be used

Set AZ
Rim Exit Device/Removable Mullion/Hold Open Closers/Hinges/Kick Plates
116-3
116-4
141-5
141-6

Set BA
Classroom Mortise Lock/Hinges/Closer/Kick Plates
130-1
137-1

Set BB
Classroom Mortise Lock/Hinges/Kick Plate
117-8

Set BC
Mag Lock/Passive Infrared Sensor/Emergency Exit Button/I/C Mortise Housing
EX-3

3.5 Hardware Sets for Project #2 – High School/Middle School

Set A
20- Marks Classroom Intruder Mortise Lockset Part # 5CL92GG/26DG1-B1
20- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
60- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set B
20-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
60- PBB hinges-Part # BB81 4.5 x 4.5 26D
Closer on opening 117-8 is to be reused on new door

Set C
7-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1

Set D
59-KSP Mortise Housing Part # 407 with Sargent Cam

Set E
15- Marks Classroom Intruder Mortise Lockset Part # 5CL92GG/26DG1-B1

Set F
1-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
1- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set G
4-Marks Classroom Intruder Leversets Part # 195RDB/26D

Set H
1-Marks Classroom Leversets Part # 195RS/26D
1- Don Jo Door Wrap Part # CW 4S2

Set I
6- Arrow Classroom Deadbolt Part # E64 I/C 26D

Set J
8-KSP Mortise Housing Part # 407x26D with Sargent Cam
14- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM

Set K
6- KSP Mortise Housing Part # 407x26
6- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set L
1- Marks Privacy Leverset Part # 195L/26D
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set M
2- Marks Passage Leverset Part # 195N/26D

Set N
1-Marks Passage Mortise Lockset Part # 5CL92N/26D
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set O
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set P
1-Marks Mortise Deadbolt Part # 5CL92S/26D

Set Q
10-KSP Rim Housings Part # 308 26D

Set R
5- Arrow Classroom Deadbolt Part # E64 I/C 26D
5- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
5- Rockwood Pull Plates Part # 106 70C32D
5- Rockwood Push Plates Part # 70C32D
15- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set S
2-Marks Mortise Deadbolt Part # 5CL92S/26D
1-Don Jo Pull Plate Part # 7115 630
1-Don Jo Push Plate Part # 71 630
1- Rockwood Pull Plates Part # 106 70C32D
1- Rockwood Push Plates Part # 70C32D

Set T
3-Marks Classroom Intruder Leversets Part # 195RDB/26D
9- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set U
1- Marks Institution Leverset Part # 195RDW/26D

Set V
3- Marks Institution Mortise Lock Part #5CL92WW/26DG1-B1

Set W
1-Marks Mortise Deadbolt Part # 5CL92S/26D
1-Don Jo Pull Plate Part # 7115 630
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM

Set X
2- Arrow Classroom Deadbolt Part # E64 I/C 26D
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
2- Rockwood Pull Plates Part # 106 70C32D
2- Rockwood Push Plates Part # 70C32D
2-Select Continuous Hinge Part # SL57HD clear

Set Y
1-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
1- Ives Flusbolts Part # 458 26D
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set Z
8- LCN Sentronic Closers Part # 4040SE alum 24DC
4-KSP Rim Housings Part # 308 26D

Set AA
1- Marks Classroom Intruder Mortise Lockset Part # 5CL92GG/26DG1-B1
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
3- PBB hinges-Part # BB81 4.5 x 4.5 26D
1- Rockwood Wall Stop Part # 409 26D

Set AB
4- Von Duprin Rim Exit Devices Part # 99L06F26D 3FT
2- Detex Removable Mullions Part # 90KR
2- I/C Core Mortise Housings
4- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM
4-Select Continuous Hinge Part # SL57HD Clear

Set AC
3-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
3- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
9- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set AD
1-Marks Mortise Deadbolt Part # 5CL92S/26D
1-Don Jo Pull Plate Part # 7115 630
1- Rockwood Push Plates Part # 70C32D
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1-Don Jo Kickplate Part # J102 626 8x34
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set AE
1- Marks Storeroom Leverset Part # 195F/26D
1-Schlage occupancy deadbolt Part # B571 626
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
3- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set AF
1- Von Duprin Rim Exit Device Part # 99EOF26D
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1- Rockwood Push Plates Part # 70C32D

Set AG
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1-Ilco Dummy Rim Cylinder Part # 7010DC 26D
1- NGP Part # A626A
2- NGP Part # 601A

Set AH
2- Von Duprin Rim Exit Devices Part # 99L06F26D 3FT
1- Detex Removable Mullions Part # 90KR
1- I/C Core Mortise Housings
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
2-Don Jo Kickplate Part # J102 626 8x34
6- PBB hinges-Part # BB81 4.5 x 4.5 26D

Set AI
1-Marks Mortise Deadbolt Part # 5CL92S/26D
1-Don Jo Pull Plate Part # 7115 630
2- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM
2-Select Continuous Hinge Part # SL57HD clear
2- Ives Flush Bolts Part # 458 26D

Set AJ
1-Select Continuous Hinge Part # SL57HD clear
1-Ilco Dummy Rim Cylinder Part # 7010DC 26D
1- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM

Set AK
1-Marks Storeroom Mortise Lockset Part # 5CL92EW/26DG1-B1
2- Ives Flush Bolts Part # 458 26D
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
6- PBB hinges-Part # BB81 4.5 x 4.5 26D
1- NGP Part # A626A
2- NGP Part # 601A
1-NGP Thresholds-Part # 513 Length per door opening

Set AL
2-Marks Storeroom Mortise Lockset Part # 5CL92EW/26DB1
2-Ilco Dummy Mortise Cylinder Part # 7180DC 26D
2- NGP Part # A626A
2- NGP Part # 601A

Set AM
2- LCN Door Closer Part # 4041XP RW/PA TBSRT DKBRZ
2- LCN Drop Plates Part # 4040 18G SRT DKBRZ

Set AN
5- Von Duprin Rim Exit Device Part # 99EO613
6- LCN Door Closer Part # 4041XP RW/PA TBSRT DKBRZ
6- LCN Drop Plates Part # 4040 18G SRT DKBRZ
6-Select Continuous Hinge Part # SL57HD DURO
1-HES Electric Strike Part # 9600 630
Please make any cosmetic repairs necessary after conversion to new hardware

Set AO
1-Marks Storeroom Mortise Lockset Part # 5CL92EW/26DG1-B1
1-Select Continuous Hinge Part # SL57HD Clear

Set AP
3-Marks Classroom Leversets Part # 195RS/26D

Set AQ
2- Marks Institution Mortise Lock Part #5CL92WW/26DG1-B1
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
6- PBB hinges-Part # BB81 4.5 x 4.5 26D
1- NGP Part # A626A
2- NGP Part # 601A
1-NGP Thresholds-Part # 513 Length per door opening\

Set AR
3- Von Duprin Rim Exit Device Part # 99EOF26D
3- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
3- NGP Part # A626A
3- NGP Part # 601A
3-NGP Thresholds-Part # 513 Length per door opening
3-Select Continuous Hinge Part # SL57HD clear

Set AS
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1- NGP Part # A626A
1- NGP Part # 601A
1-NGP Thresholds-Part # 513 Length per door opening
1-Select Continuous Hinge Part # SL57HD clear

Set AT
3- Von Duprin Rim Exit Device Part # 99EOF26D
3- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
3-HES Electric Strike Part # 9600 630
3- NGP Part # A626A
3- NGP Part # 601A
3-NGP Thresholds-Part # 513 Length per door opening
3-Select Continuous Hinge Part # SL57HD clear

Set AU
1- Von Duprin Rim Exit Device Part # 99EOF26D
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1- Detex Removable Mullions Part # 90KR
1- NGP Part # A626A
1- NGP Part # 601A
1-NGP Thresholds-Part # 513 Length per door opening
1-Select Continuous Hinge Part # SL57HD clear

Set AV
8- Von Duprin Rim Exit Device Part # 99EO613
2-KSP Rim Housings Part # 308 10B
8-Don Jo Pull Handles Part # 1151 613 powder coated with concealed fasteners
8- LCN Door Closer Part # 4041XP CUSH TBSRT DRKBR
3-HES Electric Strike Part # 9600 613
4-Aluminum Mullion Fixed DRKBR
8- NGP Part # 601A
4-NGP Thresholds-Part # 513 Length per door opening
8-Select Continuous Hinge Part # SL11 Duro
Closers to be mounted with 100 degree max opening

Set AW
4- Von Duprin Rim Exit Device Part # 99EO613
1-KSP Rim Housings Part # 308 10B
4-Don Jo Pull Handles Part # 1151 613 powder coated with concealed fasteners
4- LCN Door Closer Part # 4041XP CUSH TBSRT DRKBR
2-Aluminum Mullion Fixed DRKBR
4-Select Continuous Hinge Part # SL11 Duro
Closers to be mounted with 100 degree max opening

Set AX
1- Von Duprin Rim Exit Device Part # 99EO626
1- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
1- NGP Part # 601A
1-NGP Thresholds-Part # 513 Length per door opening
1-Select Continuous Hinge Part # SL57HD Clear

Set AY
Set not used

Set AZ
8- Von Duprin Rim Exit Devices Part # 99L06F26D 3FT
4- Detex Removable Mullions Part # 90KR
4- I/C Core Mortise Housings
8- LCN Hold Open Door Closer Part # 4041XP SHCNS TBSRT ALUM
8-Select Continuous Hinge Part # SL57HD Clear
8-Don Jo Kickplate Part # J102 626 8x34

Set BA
2-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
2- LCN Door Closer Part # 4041XP RW/PA TBSRT ALUM
6- PBB hinges-Part # BB81 4.5 x 4.5 26D
2-Don Jo Kickplate Part # J102 626 8x34

Set BB
1-Marks Classroom Mortise Lockset Part # 5CL92J/26DG1-B1
3- PBB hinges-Part # BB81 4.5 x 4.5 26D
1-Don Jo Kickplate Part # J102 626 8x34

Set BC
1-Securtitron Mag Lock Part #MM15
1-Securtitron Exit Button Part # EEB2
1-Securitron PIR Part # XMS
1-KSP Mortise Housing Part # 407 10B Standard cam
Wire mold to be used to run low voltage for cosmetic appearances

End of Schedule

SECTION 09110
METAL STUD FRAMING SYSTEM

9911 PART 1 GENERAL

9911 .1 Section Includes

A. Formed metal stud framing at interior and exterior locations.
B. Framing accessories.

9911 .2 Products Installed But not Furnished under this Section

A. Section 08100 - Hollow Metal Frames.

9911 .3 Related Sections

A. Section 03300 - Cast in Place Concrete
B. Section 04200 - Unit Masonry system
C. Section 07200 - Building Insulation within framing members
D. Section 07900 - Joint Sealers
E. Section 09260 - Gypsum Board Systems: Metal studs for partitioning

9911 .4 References

A. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
B. ASTM A525 - General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
C. ASTM A591 - Steel Sheet, Cold-Rolled, Electrolytic Zinc-Coated.
D. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track) and Rigid Furring Channels for Screw Application of Gypsum Board.
E. ASTM C754 - Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.
F. GA203 - Installation of Screw-Type Steel Framing Members to Receive Gypsum Board.
G. Metal Framing Manufacturers Association (MFMA) - Guidelines for the Use of Metal Framing.
H. SSPC (Steel Structures Paining Council) - Steel Structures Painting Manual.

9911 .5 System Description

A. Metal stud framing system for interior and exterior walls, with insulation, and interior gypsum board.

B. Maximum Allowable Deflection: 1/360 span.

C. Design wall system to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.

D. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

9911 .6 Submittals

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, type and location of fasteners, and accessories or items required of other related work.

C. Describe method for securing studs to tracks, and for blocking and reinforcement to framing connections.

D. Product Data: Provide data describing standard framing member materials and finish, product criteria, load charts, and limitations.

E. Manufacturer's installation instructions: Indicate special procedures, perimeter conditions requiring special attention.

9911 .7 Quality Assurance

A. Perform Work in accordance with GA 203, MFMA and ASTM C654.

B. Maintain one copy of each document on site.

9911 .8 Qualifications

A. Installer: Company specializing in performing the work of this section with minimum three (3) years documented experience and as approved by manufacturer.

9911 .9 Coordination

A. Coordinate with the placement of components within the stud framing system, specified in Section 09260 Gypsum Board Systems.

9912 PART 2 PRODUCTS

9912 .1 Manufacturers

A. National Gypsum bond Building Products, Product; screw stud 3 5/8 inch.
B. Unimast Incorporated Drywall Steel and Accessories, Product No 358ST22.
C. Substitutions: Under provisions of Section 01600.

9912 .2 Stud Framing Materials

A. Framing System Components: ASTM C645,3 5/8 inch and 5 5/8 inch studs.

B. Runners: Of same material and thickness as studs, bent leg retainer notched to receive studs with provision for crimp locking to stud. Ceiling Runners: With extended leg retainer.

C. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.

D. Fasteners: GA 203. Self drilling, self tapping screws.

E. Sheet Metal Backing: 20 gage steel for reinforcement.

F. Anchorage Devices: Power actuated. Drilled expansion bolts. Screws with sleeves (no plastic or wood anchors allowed).

G. Acoustic Sealant: As specified in Section 09260.

H. Touch-Up Primer for Galvanized Surfaces: SSPC - Paint 20 Type I Inorganic.

9912 .3 Fabrication

A. Fabricate assemblies of framed sections to sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

9912 .4 Finishes

A. Studs: Galvanize to G60 coating class. Electro-Galvanized.

B. Tracks and Headers: Galvanize to G60 coating class. Electro-galvanized.

C. Accessories: Same finish as framing members. ASTM A123, hot dip galvanized to 1.25 oz/sq. ft.

9913 PART 3 EXECUTION

9913 .1 Examination

A. Verify site conditions under provisions of Section 01050.

B. Verify that conditions are ready to receive work.

C. Verify that rough-in utilities are in proper location.

9913 .2 Erection

A. All stud partitions to be run full height, floor to roof deck.

B. Align and secure top and bottom runners at 24 inches o.c.

C. Achieve an air tight seal between runners and substrate with acoustical sealant.

D. Achieve an air tight seal between studs and adjacent vertical surfaces with acoustical sealant.

E. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

F. Install studs vertically at 16 inches minimum on center - interior. Exterior, 24 inches on center.

G. At doors provide two (2) 20 gage studs at each jamb.

H. Align stud web openings horizontally.

I. Secure studs to tracks using crimping or clip and tie method. Do not weld, unless noted otherwise.

J. Stud splicing not permissible.

K. Fabricate corners using a minimum of three studs.

L. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.

M. Brace stud framing system rigid.

N. Coordinate erection of studs with requirements of door frames, window frames, and other framed units (see drawings); install supports and attachments.

O. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.

P. Blocking: Secure wood blocking to studs. Secure steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, etc.

Q. Refer to drawings for indication of partitions extending to finished ceiling only and for partitions extending through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.

R. Coordinate placement of insulation in stud spaces made inaccessible after stud framing erection.

9913 .3 Erection Tolerances

A. Maximum Variation From True Position: 1/16 inch.

B. Maximum Variation of any Member from Plane: 1/16 inch.

C. Maximum Variation From Plumb: 1/16 inch.

END OF SECTION

SECTION 09260
GYPSUM BOARD SYSTEMS

9261 PART I GENERAL

9261.1 Section Includes

A. Acoustical insulation.
B. Gypsum Board.
C. Taped and sanded joint treatment.

9261.2 Products Installed But Not Furnished Under This Section

A. Section 10800 - Toilet & Bath Accessories: Frames for recessed washroom accessories.

9261.3 Related Sections

A. Section 08100 - Hollow Metal Frames
B. Section 09110 - Metal Stud Framing System
C. Section 09900 - Painting; Surface Finish.

9261.4 References

A. ASTM C36 - Gypsum Wallboard.
B. ASTM C79 - Gypsum Sheathing Board.
C. ASTM C442 - Gypsum Backing Board and Core Board.
D. ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.
E. ASTM C514 - Nails for the Application of Gypsum Wallboard.
F. ASTM C557 - Adhesive for Fastening Gypsum Wallboard to Wood Framing.
G. ASTM C630 - Water Resistant Gypsum Backing Board.
H. ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.
I. ASTM C840 - Application and Finishing of Gypsum Board.
J. ASTM C931 - Exterior Gypsum Soffit Board.
K. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board.
L. ASTM E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
M. ASTM E119 - Fire Tests of Building Construction and Materials.
N. GA - 201 - Gypsum Board for Walls and Ceilings.
O. GA - 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
P. GA - 600 - Fire Resistance Design Manual.

9261.5 Submittals

A. Submit under provisions of Section 01300.
B. Shop Drawings: Indicate special details associated with fireproofing.
C. Product Data: Provide data on gypsum board, joint tape and decorative finish.

9261.6 Quality Assurance

A. Perform Work in accordance with ASTM C840.

9261.7 Qualifications

A. Applicator: Company specializing in performing the work of this section with minimum three years experience and as approved by manufacturer.

9261.8 Regulatory Requirements

A. Conform to applicable code for fire rated assemblies in conjunction with Section 06100 as follows:
   1. 1 hr. Fire Rated Ceiling and Soffits: Listed assembly By UL No. 469.
   2. 1 hr. Fire Rated Partition: Listed assembly by UL No. 301.

9262 PART 2 PRODUCTS

9262.1 Manufacturers - Gypsum Board System

A. United States Gypsum Co.
B. Other acceptable manufacturers offering equivalent products:
   1. Gold Bond Building Products.
   2. Georgia Pacific Corporation

9262.2 Framing Materials

A. Framing Materials: As specified in Section 09110 - Metal Stud Framing System.
B. Furring, Framing and Accessories: GA-216 and GA-600.
C. Fasteners: ASTM C514.
D. Anchorage to Substrate: tie wire, screws and other metal supports, of type and size to suit application: to rigidly secure materials in place. Nails will not be allowed as fasteners for installation of gypsum board or accessories.
E. Adhesive: ASTM C557.

9262.3 Gypsum Board Materials

A. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL rated 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

B. Abuse Resistant Gypsum Panels: ASTM C36 - 5/8 inch thick. Equal to “Sheet Rock Abuse-Resistant Gypsum Panels” as manufactured by United States Gypsum Company and Fiberboard Wallboard as manufactured by Louisiana Pacific Corporation.

9262.4 Accessories

A. Acoustical Insulation: ASTM C665; performed glass fiber, friction fit type, unfaced, thickness corresponding to stud size.

B. Corner and bullnose Beads: Metal.

C. Edge Trim: Manufacturer’s standard J. Channel for finish with joint compound.

D. Expansion Joint: Manufacturer’s standard control joint for finish with joint compound and sealant.

E. Joint Materials: ASTM C475: reinforcing tape, joint compound, adhesive, and water.

F. Textured Finish Materials: Latex Based texturing material, containing fine aggregate. Equal to “imperial QT E-Z Spray” course finish manufactured by United States Gypsum Company.

9263 PART 3 EXECUTION

9263.1 Examination

A. Verify site conditions under provisions of Section 01050.

B. Verify that site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

9263.2 Framing For Fire Ratings

A. Install framing as required for fire resistance ratings indicated.

9263.3 Gypsum board Installation

A. Install gypsum board in accordance with manufacturers instructions.

B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.

D. Erect exterior gypsum sheathing horizontally, with edges butted tight and ends occurring over firm bearing.

E. Use screws when fastening gypsum board to framing.

F. Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum sheathing with sealant as recommended by the manufacturer.

G. Place control joints consistent with lines of building spaces as indicated.

H. Place corner and bullnose beads and trim at external corners and exposed ends as indicated. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials as indicated.

9263.4 Joint Treatment

A. Tape, fill and sand exposed joints, edges and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

C. taping, filling and sanding is not required on concealed surfaces except fire rated construction and draft stop separations require taping.

9263.5 Tolerances

A. Maximum variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09300
CERAMIC FLOOR AND WALL TILE

9301 PART I GENERAL

9301.1 Section Includes

A. Tile and Accessories:
   1. Floor and Wall Ceramic Tile.
   2. Mosaic Tile.
   3. Tile Setting Materials.

9301.2 Related Sections

A. Section 07900 - Joint Sealers: Mildew resistant sealant.
B. Section 09650 - Resilient Flooring: Transition to/from.
C. Section 09680 - Carpet: Transition to/from.

9301.3 References

A. American national Standards Institute (ANSI):
   1. ANSI A108/A118/A136.1 – Specifications for the Installation of Ceramic Tile.
   2. ANSI A137.1 – Specifications for Ceramic Tile.
B. American International (ASTM):
   1. ASTM C144 – Standard Specification for Aggregate for Masonry Mortar.
   2. ASTM C150 – Standard Specification for Portland Cement.
   3. ASTM C1028 – Standard Test Method for Determining the Static Coefficient of Friction or Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
   4. ASTM D4397 – Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
C. Tile Council of North American (TCNA): TCA Handbook for Ceramic Tile Installation, 2010.

9301.4 Performance Requirements

A. Static Coefficient of Friction: Tile on walkway surfaces shall meet or exceed the following values as determined by testing in conformance with ASTM C1028.
   1. Level Surfaces: minimum of 0.6 (Wet).
   2. Step Treads: Minimum of 0.6 (wet).
   3. Ramp Surfaces: Minimum of 0.8 (Wet).

9301.5 Submittals

A. Submit under provisions of Section 01300. Obtain approvals of submittals prior to delivering products to the jobsite.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar material, control and expansion joints, threashold, ceramic accessories, and setting details.
D. Selection samples: color charts illustrating full range of colors and patterns.
E. Selection Samples: Full size samples of actual tiles for selection.
F. Verification Samples: For tile 8 by 8 inches (203 by 203mm) and smaller, mount actual units on minimum 12 by 12 inch (305 by 305 mm) plywood panels and grout with selected grout. For larger tile, submit two units of each type, and grout chart indicating selection.
G. Maintenance Data: Included recommended cleaning methods, cleaning materials, and maintenance coatings.

9301.6 Quality Assurance

A. Installer Qualifications: company specializing in performing the work of this section with minimum two years experience.
B. Single Source Responsibility: Obtain each type and color of the tile from a single source. Obtain each type and color of mortar, adhesive and grout from the same source.
C. General: Provide tile that complies with ANSI A137.1 where applicable for types, compositions and other characteristics indicated. Provide tile in the locations and of the types colors and pattern indicated on the Drawings.
   1. Factory Blending: For tile exhibiting color variations within the ranges selected under Submittal of samples, blend tile in the factory and package so tile taken from one package shows the same range of colors as those taken form other packages.
   2. Mounting: For factory mounted tile, provide back or edge mounted tile assemblies as standard with the manufacturer, unless otherwise specified.
   3. Factory Applied Temporary Protective Coatings: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with a continuous film of petroleum paraffin was applied hot. Do not coat unexposed tile surfaces.

9301.7 Delivery, Storage, and Handling

A. Deliver and store products in manufacturer's unopened packaging until ready for installation.
B. Protect setting materials from freezing or overheating in accordance with manufacturer's instructions.
C. Store tile and setting materials on elevated platforms, under cover and in a dry location and protect from contamination, dampness, freezing or overheating.

9301.8 Environmental Requirements

A. Do not install adhesives in an unventilated environment.
B. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during tiling and for a minimum of 7 days after completion.

9301.9 Extra Materials

A. Provide for Owner's use a minimum of 2 percent of the primary sizes and colors of tile specified, boxed and clearly labeled.

9302 PART 2 PRODUCTS

9302.1 Manufacturers

A. Acceptable Manufacturer: American Olean Tile Co., which is located at: 7834 C F. Hawn Fwy. P.O. box 17130; Dallas, TX 75217; Toll Fee Tel:888-AOT TILE; Tel: 214-398-1411; Email: request info (gina.morman@daltile.com); Web: www.americanolean.com
B. Substitutions:
   1. Dal Tile
   2. Interceramic
   3. American Clean Tile
   4. United States Ceramic Tile

9302.2 Tile

A. Mosaic Tile (For all designated bathroom floors, unless noted otherwise):
   1. Series: Unglazed Mosaics and Options.
   2. Floor Field Tile Size: 2 by 2 inches.
   3. Surface Finishes: Plain.
   4. Trim: Sanitary Cove Base

B. Wall Tile (For all designated bathroom and shower room walls, unless noted otherwise):

1. Field Tile Size: 4 ¼ by 4 ¼ inches.

2. Interceramic wall tile, selection from Group 1 or Group II colors.

C. Wall and Floor and Tile: (For floors and walls of HS/MS bathrooms 229 & 230 and all designated corridor/courtyard interior walls indicated on the plans).

1. Series 13x13 Interceramic Travertino Royal

9302.3 Tile Setting Materials

A. Tile Setting Materials: Comply with ANSI A108/A118/A136.1 as applicable to the installation methods referenced in Part 3 of this Section

B. Silicone Sealant: Silicone sealant, moisture and mildew resistant type, white, use for shower floors and shower walls.

C. Patching and Leveling Compound: As recommended by tile manufacturer and compatible with both substrate and settling materials.

D. Cleavage Membrane at Floors: Polyethylene Film. ASTM D 4397, 4.0 mil thickness.

E. Membrane at Walls: Polyethylene Film, ASTM D 4397, 4.0 mil thickness.

9303 PART 3 EXECUTION

9303.1 Examination

A. Acceptability of Surfaces: Inspect surfaces to be tiled to ensure proper bonding can be achieved, and to verify that surfaces are free of curing membranes, oil, grease, wax and dust.

B. Substrate Tolerances: Before tiling, inspect surfaces to be tiled to verify that the follow tolerances are not exceeded. If tolerances are exceeded, provide specified leveling coat to achieve specified tolerances.

1. Walls: 1/8 inch in 8 feet (3 mm in 2.4 m) for dry-set mortar, epoxy and organic adhesives.

2. Floors: 1/8 inch in 10 feet (3 mm in 3m) for dry-set mortar and epoxy, 1/16 inch in 3 feet (1.5 mm in 1 m) for organic adhesive.

9303.2 Preparation

A. Layout: Determine locations of control and expansion joints before starting tile work. Layout tile work to minimize cuts less than one-half tile in size.

9303.3 Installation

A. General: Comply with ANSI A108/A118/A136.1 and manufacturer's recommendations. Comply with applicable TCA Handbook for Tile Installation Requirements as listed below.

B. Floors, Interior, Concrete Subfloor:

1. TCA F114, latex=Portland cement mortar.

C. Floors, Interior, Concrete Subfloor, Waterproof Membrane:

1. TCA F122, thin-set

D. Floors, Interior, Concrete subfloor, Crack Isolation Membrane:

1. TCA F125, partial coverage

E. Walls, Exterior and Interior:

1. TCA W202, latex-Portland cement mortar.

F. Walls, Interior, Masonry or Concrete:
1. TCA W211, cement mortar, bonded.

G. Walls, Interior, Solid Backing:
1. TCA W221, cement mortar.
2. TCA W222, one-coat method.
3. TCA W223, organic adhesive.

I. Walls, Interior, Metal Studs:
1. TCA W244C, interior, thin-set.

9303.4 Cleaning and Protection

A Cleaning: Clean tile within time period recommended by manufacturer, using materials recommended by manufacturer.

B. Protection: Prohibit foot and wheeled traffic from floors for a minimum of 3 days. Where traffic is unavoidable, provide large flat boards in walkways and wheelways for a minimum of 7 days after installation. Protect from construction dirt and debris with heavy-duty, non-staining construction paper, masked in place.

END OF SECTION

SECTION 09500
SUSPENDED ACOUSTICAL CEILINGS

9501 PART 1 GENERAL

9501 .1 Section Includes

A. Suspended metal grid ceiling system and perimeter trim.
B. Acoustical tile.

9501 .2 References

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
C. ATM E1264 - Classification of Acoustical Ceiling Products.
D. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

9501 .3 System Description

A. Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

9501 .4 Submittals

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on metal grid system components, acoustical units and panels.
C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

9501 .5 Qualifications

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

9501 .6 Regulatory Requirements

A. Conform to applicable code for fire rated assembly and combustibility requirements for materials.

9501 .7 Extra Materials

A. Furnish under provisions of Section 01700.
B. Provide 2 full boxes of extra tile of (each type) to Owner.

9502 PART 2 PRODUCTS

9502 .1 Manufacturers - Suspension System

A. Armstrong World Industries, Chicago Metallic Corporation.
B. USG Interior Systems.
C. Chicago Metallic.

9502 .2 Suspension System Materials

A. Non-fire Rated Grid: ASTM C635, intermediate; components die cut and interlocking. Equal to "DXL" as manufactured by USG Interior Systems. Install in all rooms unless noted otherwise.
B. Humidity resistant grid: Aluminum capped grid. Equal to DXLA as manufactured by USG Interior Systems. Install in all bathrooms.
C. Exposed Grid Surface Width: 15/16 inch.
D. Grid Finish: Color to match existing**.**
E. Accessories: Stabilizer bars, clips, splices, edge moldings, bull nose corner trim and hold down clips required for suspended grid system.
F. Support Channels and Hangers: Galvanized steel; size and type to suit application, and ceiling system flatness requirement specified.

9502 .3 Manufacturers - Acoustical Units

A. Armstrong World Industries.
B. USG Interior Systems.
C. Celtics Corporation.

9502 .4 Acoustical Unit Materials

A. Acoustical tile for all rooms, unless noted otherwise; Armstrong 915 Textured Fireguard, conforming to the following:
    1. Size: 24 x 48 inches, 3/4" thickness
    2. Non-directional.
    3. Square edge
    4. Fire Hazard Classification: Class A

B. Acoustical tile for bathrooms 229 & 230 in the HS, Armstrong Cirrus, conforming to the following:
    1. Size: 24 x 24 inches, ¾" thickness.
    2. Angled regular edge
    3. Fire Hazard Classification: Class A

9502 .5 Accessories

A. Touch-up Paint: Type and color to match acoustical and grid units.

9503 PART 3 EXECUTION

9503 .1 Examination

A. Verify site conditions under provisions of Section 01050.
B. Verify that layout of hangers will not interfere with other work.

9503 .2 Installation - Lay-In Grid Suspension System Examination

A. Install suspension system in accordance with ASTM C636 and as supplemented in this section.
B. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.
C. Locate system according to reflected plan.
D. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.
E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support components and light fixtures independently.
H. Do not eccentrically load system, or produce rotation of runners.
I. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.
J. Install bullnose corner edge molding trim at all bullnose corners.

9503 .3 Installation - Acoustical Units

A. Install acoustical units in accordance with manufacturer's instructions.
B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
C. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border trim neatly against abutting surfaces.
D. Install units after above ceiling work is complete.
E. Install acoustical units level, in no form plane and free from twist, warp and dents.
F. Cut tile to fit irregular grid and perimeter edge trim.
G. Where bullnose concrete block corners round obstructions occur, provide performed closers to match edge molding.
H. Install hold-down clips to retain panels tight to grid system within 20 ft. of an exterior door.

9503 .4 Erection Tolerances

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

C. **END OF SECTION**

SECTION 09650
RESILIENT FLOORING

9651 PART 1 GENERAL

9651 .1 Section Includes

A. Resilient tile flooring.
B. Resilient base.
C. Gym Sports Floor

9651 .2 References

A. ASTM E84 - Surface Burning Characteristics of Building Materials.
B. ASTM F1066 - Vinyl Composition Floor Tile.
C. FS L-F-475 - Floor Covering, Vinyl Surface (Tile and Roll), with Backing.
D. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

9651 .3 Submittals

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
C. Samples: Submit two samples, 2 x 2 inch in size illustrating color and pattern for each floor material for each color specified.
D. Submit two 2 inch long samples of base material for each color.
E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

9651 .4 Regulatory Requirements

A. Conform to applicable code for flame/smoke rating requirements in accordance with ASTM E84.

9651 .5 Delivery, Storage, and Handling

A. Deliver, store, protect and handle products to site under provisions of Section 01600.

9651 .6 Environmental Requirements

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

9651 .7 Maintenance Data

A. Submit under provisions of Section -1700.
B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

9651 .8 Extra Materials

A. Furnish under provisions of Section -1700.
B. Provide 200 sq. ft. of flooring, 100 lineal feet of base, of each material specified.

9652 PART 2 PRODUCTS

9652 .1 Materials - Tile Flooring

A. Vinyl Composition Tile: FS SS T 312 B (1) Type IV, Composition I. Patterns and colors as selected by Engineer.
    1. Size: 12 x 12 inch
    2. Thickness: 1/8 inch
    3. Design: plain
    4. Manufacturers:
        a. Armstrong, Style; Standard Excelon
        b. Amtico, Style; Decathlon Premium Grade Contract Tile
        c. Tarkett, Style; Expressions Tile

9652 .2 Materials - Rubber Base

A. Base: FS Rubber. Patterns and colors as selected by Engineer.
    1. Height: 4 inch
    2. Thickness: 1/8 inch thick
    3. Length: 4 foot sections
    4. Manufacturers:
        a. Burke Flooring Products
        b. Johnsonite - Johnson Rubber Company
        c. Roppe

9652 .3 Gym Sports Floor (Lincoln Elementary

A. Bid as Alternate 100-9.
B. Rexcourt 0004V (6.5 mm thickness) resilient sheet product.

9652 .4 Accessories

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.
C. Sealer and Wax: Types recommended by flooring manufacturer.

9653 PART 3 EXECUTION

9653 .1 Examination

A. Verify concrete floors are dry to a maximum moisture content of 7 percent, and exhibit negative alkalinity, carbonization, or dusting.
B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

9653 .2 Preparation

A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
B. Prohibit traffic until filler is cured.
C. Vacuum clean substrate.
D. Apply primer to surfaces.

9653 .3 Installation - Tile Flooring

A. Install in accordance with manufacturer's instructions.
B. Mix tile from container to ensure shade variations are consistent when tile is placed.
C. Spread only enough adhesive to permit installation of materials before initial set.
D. Set flooring in place, press with heavy roller to attain full adhesion.
E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
F. Install tile to basket weave pattern. Allow minimum ½ full size tile width at room or area perimeter.
G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
H. Install metal edge strips at unprotected or exposed edges, and where flooring terminates.
I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
J. Install flooring in pan type floor access covers. Maintain floor pattern.
K. At movable partitions install flooring under partitions without interrupting floor pattern.
L. Install feature strips, edge strips, and floor markings where indicated. Fit joints tightly.

9653 .4 Installation - Base

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tight to wall and floor surfaces.
D. Scribe and fit to door frames and other interruptions. Install base on all casework and/or as indicated.

9653 .5 Installation – Gym Sport Floor

A. Install in accordance with manufacturer's written instructions.
B. Include gym floor marking to match the existing floor to be removed.

9653 .6 Cleaning

A. Clean work under provisions of 01700.
B. Remove access adhesive from floor, base, and wall surfaces without damage.
C. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

9653 .7 Protection of Finished Work

A. Protect finished work under provisions of Section 01040.
B. Prohibit traffic on floor finish for 48 hours after installation.

END OF SECTION

SECTION 09680
CARPET

09681 PART 1 GENERAL

09681.1 Summary

A. New Carpet shall be installed in the vestibule (room 101) of the High School/Middle School.

09682 PART 2 PRODUCTS

09682.1 Products

A. Carpet shall be “Ruffian II” – Infinity RE Modular, (or approved equal) as manufactured by Mannington.

09683 PART 3 EXECUTION

09683.1 Execution

A. Carpet shall be installed in accordance with manufacturer’s written instruction.

END OF SECTION

SECTION 09810
INTERIOR FINISH SYSTEM FOR SHOWER ROOMS

Part 1 GENERAL

1.01 Summary

A. Materials and installation of the Sto Interior Finish System for Pool Rooms.

1.02 Submittals

A. Manufacturer's specifications, details, installation instructions and product data.
B. Applicator's certificate of instruction.
C. Manufacturer's standard warranty.
D. Sealant Manufacturer's test data.

1.03 References

A. ASTM Standards:

1. C 150	Specification for Portland Cement
2. C 297	Test Method for Tensile Strength of Flat Sandwich Constructions in Flatwise Plane
3. C 1178	Specification for Glass Mat Water-Resistant Gypsum Backing Board
4. D 968	Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive
5. D 1784	Specification for Rigid Poly (Vinyl Chloride) (PVC) and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
6. D 2247	Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
7. D 3273	Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
8. E 84	Test Method for Surface Burning Characteristics of Building Materials
9. E 96	Test Methods for Water Vapor Transmission of Materials
10. E 119	Method for Fire Tests of Building Construction and Materials

B. EIMA (EIFS Industry Members Association) Standards and Publications

ASTM E-2098	Standard Test Method for determining tensile breaking strength of glass fiber reinforced mesh for use in Class PB EIFS after exposure to a sodium hydroxide solution.
105.01	Standard Test Method for Alkali Resistance of Glass Fiber Reinforcing Mesh for use in Exterior Insulation and Finishing Systems (EIFS), Class PB

C. Proprietary Specifications

1. C225	Georgia-Pacific Corporation, "Dens Shield the Ultimate Tile Backer"

1.04 Design Requirements

A. Design for maximum allowable system deflection, normal to the plane of the wall or ceiling, of L/360.

B. Prevent the accumulation of water behind the system, either by condensation or leakage through the wall or ceiling construction, in the design and detailing of the wall assembly.

C. Provide vapor barrier connections at windows, doors, lighting fixtures, electrical outlets and all other penetrations through the system.

1.05 Performance Requirements

A. System Performance

Test	Method	Criteria	Result
1.Tensile Adhesion	ASTM C-297	No failure in the base coat or finish coat.	Passed
2.Water Resistance	ASTM D-2247	No deleterious effects* at 14 day exposure	Passed
3. Permeance	ASTM E-96	**<1.0 Perms**	Passed
4. Abrasion Resistance	ASTM D-968	No cracking, checking, or loss of film integrity at 1,057 quarts (1,000 L) of sand	Passed
5. Mildew Resistance	ASTM D-3273	No growth supported during 28 day exposure period	No growth at 42 days
6. Alkali Resistance of Reinforcing Mesh	EIMA 105.01	Greater than 120 pli (21dn/cm) retained tensile strength	Passed
7.Surface Burning	ASTM E-84	Base coat and finish coat each have a flame spread of 25 or less and smoke developed of 450 or less	All components passed
8. Fire Resistance	ASTM E-119	One hour fire resistive rating	Passed

* No deleterious effects: no cracking, checking, crazing, erosion, rusting, blistering, peeling or delamination.

1.06 Quality Assurance

A. Manufacturer requirements

1. System manufacturer for a minimum of fifteen (25) years.

B. Contractor requirements

1. Engaged in application for a minimum of three (3) years.

2. Knowledgeable in the proper use and handling of Sto materials.

3. Employ skilled mechanics who are experienced and knowledgeable in Sto product application, and familiar with the requirements of the specified work.

4. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.

5. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with Sto's published specifications and details and the project plans and specifications.

1.07 Delivery, Storage and Handling

A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.

B. Protect coatings (pail products) from freezing and temperatures in excess of 90^{o} F (32^{o} C). Store away from direct sunlight.

C. Protect Portland cement based materials (bag products) from moisture and humidity. Store under cover off the ground in a dry location.

1.08 Project/Site Conditions

A. Maintain ambient and surface temperatures above 40^{o} F (4^{o} C) during application and drying period, minimum 24 hours after application of the system.

B. Provide supplementary heat for installation and drying times in temperatures less than 40^{o} F (4^{o} C).

C. Provide protection of surrounding areas and adjacent surfaces from application of materials.

1.09 Coordination/Scheduling

A. Coordinate sealing of the system at lighting fixtures and all other penetrations through the system.

1.10 Warranty

A. Provide manufacturer's standard limited materials warranty.

Part 2 PRODUCTS

2.01 Manufacturers

A. Sto Corp. - Atlanta, GA
Georgia-Pacific Corporation - Atlanta, GA
Plastic Components - Miami, FL (or approved equal)

B. Sealants are to be single component neutral cure silicones, single component moisture cure polyurethanes, or evaporative cure acrylic latex and meet ASTM C-1382.

2.02 Wall Board/Substrate

A. **Dens Shield** - a glass mat faced, siliconized gypsum core tile backer board, suitable for use in high humidity areas as manufactured by Georgia-Pacific Corporation.

2.03 Accessories

A. A high impact, interior grade rigid PVC plastic conforming to ASTM D-1784-69, cell classification 13244C.

B. Flanges are to be perforated for proper keying of base coat and reinforcing mesh.

C. Accessories include, but are not limited to, casing beads, starter tracks, J-beads, corner beads and expansion joints, drywall grid for suspension support, etc.

2.04 Mechanical Fasteners

A. Non-corroding fasteners as appropriate for substrate: for example, Buildex Tapcon fasteners for concrete or masonry, Buildex Type S-12 for metal framing and Buildex Hi-Lo for wood framing.

2.05 Base Coat *(either one can be used)*

A. Sto Flexyl - an acrylic-based, fiber reinforced, flexible waterproofer.
B. **Sto Watertight Coat** – Flexible, breathable waterproof membrane.

2.06 Reinforcing Meshes

A. Standard Mesh - Sto Mesh - nominal 4.5 oz./sq.yd. (153 g/m2), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials.

2.07 Primer

A. Sto Primer - Acrylic based primer (for Sto acrylic based finishes).

2.08 Finish Coat

A. Stolit - acrylic-based textured wall coating with graded marble aggregate.

2.09 Job Mixed Ingredients

A. Portland Cement: ASTM C 150, Type I.

B. Water: Clean and potable.

2.10 Mixing

A. Sto Flexyl: mix ratio with Portland cement: 1:1 ratio by weight. Pour Sto Flexyl into a clean mixing pail. Add Portland cement, mix to a uniform consistency and allow to set for approximately 5 minutes. Adjust mix if necessary with additional Sto Flexyl or cement and remix to a uniform trowel consistency. Avoid retempering. Keep mix ratio consistent. Do not add water.

B. **Sto Watertight Coat** – Use both components at a preconditioned temperature of 70° ± 5°F (21 ± 3°C). Use one 2.3 gal. pail (8.9L) of Component A per one 25 lb. bag (11 kg) of Component B. Alternately, batch mix in ½ units. Mixing must be achieved mechanically using a slow-speed drill and a mixing paddle. Mix thoroughly for at least 3 minutes to a uniform, lumpfree consistency. Once mixed, the working time is approximately 30 – 90 minutes, depending upon material, ambient and surfact conditions.

C. Sto Primers: mix to a uniform consistency immediately before use.

D. Sto Finishes: mix to a uniform consistency. A small amount of water may be added to adjust workability. Limit addition of water to the minimum amount needed to achieve the finish texture. Do not add water in excess of maximum water addition allowed based on product instructions.

E. Mix materials with a clean, rust-free high speed mixer in a clean mixing pail.

F. Mix only as much material as can readily be used.

G. Do not use anti-freeze compounds or other additives.

Part 3 EXECUTION

3.01 Acceptable Installers

A. Prequalify under Quality Assurance requirements of this specification (Section 1.07.B).

3.02 Examination

A. Inspect wallboard application for compliance with applicable requirement:

1. Glass mat faced, siliconized gypsum core, tile backer board -- Georgia-Pacific Publication A225

B. Inspect penetrations through the system for vapor retarder connection.

C. Report deviations from the requirements of project specifications or other conditions that might adversely affect the installation to the General Contractor.

3.03 Surface Preparation

A. Replace damaged wallboard.
B. Remove any surface contamination on the wallboard that may adversely affect adhesion.

3.04 Installation

A. Install accessories (starter tracks, casing beads, corner beads, expansion joints and control joints) in accordance with manufacturer's specifications.

B. Base Coat and Reinforcing Mesh Application

1. Apply minimum 9x12 inch (225x300 mm) diagonal strips (using Sto Detail Mesh) at corners of all penetrations through the system. Embed strips in wet base coat and trowel from the center to the edges of the mesh to avoid wrinkles.

2. Standard mesh application: Apply base coat over the wallboard with spray equipment or a stainless steel trowel to a uniform thickness of approximately 1/8 inch (3 mm). Work horizontally or vertically in strips of 40 inches (1016 mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2- ½ inches (64 mm) at mesh seams and feather at seams. Double wrap all inside and outside corners with minimum 2- ½ inch (64 mm) overlap in each direction. Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible.

(Note: Where corner bead accessory is used, overlap mesh onto perforated flange of corner bead.)

C. Apply primer by brush roller or spray to the base coat and allow to dry.

D. Finish Coat Application

1. Apply finish directly over the primed base coat ONLY AFTER THE PRIMED BASE COAT HAS THOROUGHLY DRIED. Apply finish by spraying or troweling with a stainless steel trowel, depending on the finish specified. Follow these general rules for application of finish:

a. Avoid application in direct sunlight.
b. Apply finish in a continuous application, and work to a wet edge.
c. Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying and may require adjustments in the scheduling of work to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of protection against wind, dust, dirt, rain and freezing. Adjust work schedule and provide protection.

d. Float "R" (rilled texture) finishes with a plastic trowel to achieve their rilled texture.
e. Do not install separate batches of finish side-by-side.
f. Do not apply finish into or over sealant joints. Apply finish to outside face of wall only.
g. Do not apply finish over irregular or unprepared surfaces, or surfaces not in compliance with the requirements of the project specifications.

3.05 Protection

A. Provide protection of installed materials from water infiltration into or behind the system.

B. Provide protection of installed System from dust, dirt, precipitation freezing and continuous high humidity until coatings are fully dry.

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SECTION 09900
PAINTING

9901 PART 1 GENERAL

9901 .1 Section Includes

A. Surface preparation and field application of paints and coatings.

9901 .2 Related Sections

A. Section 08100 - Hollow Metal Doors & Frames
B. Section 09250 - Gypsum Board Assemblies

9901 .3 References

A. ASTM D16 - Definitions of terms relating to Paint, Varnish, Lacquer, and Related Products.
B. ASTM D2016 - Test Method for Moisture Content of Wood.
C. AWWA (American Water Works Association) - C204 - Chlorinated Rubber-Alkyd Paint Systems for the Exterior of Above Ground Steel Water Piping.
D. AWWA (American Water Works Association) - D102 - Painting Steel Water Storage Tanks.
E. NACE (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.
F. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.
G. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

9901 .4 Definitions

A. Conform to ASTM D16 for interpretation of terms used in this Section.

9901 .5 Submittals

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on all finishing products.
C. Samples: Submit two samples, illustrating range of colors and textures available for each surface finishing product scheduled.
D. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

9901 .6 Qualifications

A. Manufacturer: Company specializing in manufacturing the Product specified in this section with minimum three years experience.
B. Applicator: Company specializing in performing the work of this section with minimum three years experience and as approved by manufacturer.

9901 .7 Regulatory Requirements

A. Conform to applicable code for flame and smoke rating requirements for finishes.

9901 .8 Delivery, Storage, and Handling

A. Deliver, store, protect and handle products to site under provisions of Section 01600.
B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
C. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

9901 .9 Environmental Requirements

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
C. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
D. Minimum Application Temperature for Varnish and Stain Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

9901 .10 Extra Materials

A. Furnish under provision of Section 01700.
B. Provide 1 gallon of each color, type, and surface texture to Owner.
C. Label each container with color, type, texture, room locations, in addition to the manufacturer's label.

9902 PART 2 PRODUCTS

9902 .1 Acceptable Manufacturers

A. Manufacturers - Paint
   1. ICI Dulux
   2. Benjamin Moore and Company
   3. PPG Industries, Pittsburgh Paints
   4. Sherwin - Williams Company

9902 .2 Materials

A. Coatings: Ready mixed. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of steaks or sags.

B. Patching Materials: Latex filler.

C. Fastener Head Cover Materials: Latex filler.

9902 .3 Finishes (The Following Paint Type are ICI)

A. Drywall walls, soffits, ceilings, etc.: Latex, Semi-Gloss
   1. First coat - Primer 1030 - 1200
   2. Second coat – 1416 - xxxx
   3. Third coat – 1416 - xxxx

B. Concrete block masonry - interior: Latex, Semi-Gloss (unless noted otherwise)
   1. First coat (block filler) – 1030 - 1200
   2. Second coat – 1416 - xxxx
   3. Third coat – 1416 – xxxx

C. Concrete Floors Designated to Receive Epoxy Finish
   1. Surface Prop - Detergent cleaning followed by acid etch.
   2. First Coat - Stonehard Polyamide GS3.
   3. Finish Coat - Stonehard GS4 (100% Solids Epoxy)

D. Hollow metal doors and frames, interior: Alkyd Enamel, Semi-Gloss
   1. First coat - Factory primed
   2. Second coat – 1516 - xxxx
   3. Third coat – 1516 – xxxx

E. Hollow metal doors and frames, exterior: Industrial Enamel, Semi-Gloss
   1. First coat - Factory primed

2. Second coat 4308 - xxxx
3. Third coat – 4308 - xxxx

F. Exterior non-galvanized existing steel lintels (applicable at window replacement areas): Industrial Enamel, Semi-gloss

1. Surface Prep – Hand tool clean
2. First coat – Primer 4308-xxx
3. Finish coat – Industrial enamel 4308-xxxx

G. Exterior steel framing: Semi-Gloss Oil fallout

1. First coat – Factory Primer
2. Second coat – 1586 – xxxx Spraymaster Alkyd Semigloss DryFall

H. Interior exposed structural steel: Alkyd Enamel, Semi-Gloss

1. First coat – Fabricator primed
2. Second coat – 1516 - xxxx
3. Third coat – 1516 - xxxx

I. Concrete block masonry, interior, bathrooms and janitors closet, water base epoxy.

1. First coat – (Block filler) 1030 - 1200
2. Second coat – 4408 - xxxx
3. Third coat – 4408 - xxxx

J. Visitor's Bleachers at Thompson Field (Project #3)

1. Surface Prep: Abrasive blast (near white). Remove aluminum seats prior to blasting; also protect concrete slab and other areas. Areas blasted shall be primed on the same day.
2. First coat – Epoxy primer
3. Second coat – Epoxy intermediate
4. Finish coat - Polyurethane

9902 .4 Inspection:

A. Applicator must examine areas and conditions under which painting work is to be applied and notify the Engineer in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Applicator.

B. Starting of painting work will be construed as Applicator's acceptance of surfaces and conditions within any particular area.

C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces or conditions otherwise detrimental to formation of durable paint film.

9902 .5 Surface Preparation:

A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified for each particular substrate condition.

B. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.

C. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.

D. Protect floors and installed finish materials in areas where paint is being applied with clean drop cloths or other suitable methods.

9902 .6 PART 3 EXECUTION

9902 .7 Examination

A. Verify site conditions under provisions of Section 01050.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do no apply finishes unless moisture content of surfaces are below the following maximums:

1. Plaster and Gypsum Wall board: 12 percent.
2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D2016.
4. Exterior Wood: 15 percent, measured in accordance with ASTM D2016.
5. Concrete Floors: 8 percent.

9902 .8 Preparation

A. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Seal with shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

F. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

G. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

H. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

I. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

J. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting, clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts and nuts are similarly cleaned. Spot prime paint after repairs.

K. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make tough-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

L. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer and paint tops and bottoms of all metal doors.

9902 .9 Application

A. Apply products in accordance with manufacturers instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand wood and metal lightly between coats to achieve required finish.

F. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

G. Allow applied coat to dry before next coat is applied.

H. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

I. Prime concealed surfaces of interior and exterior woodwork with primer paint.

J. Prime concealed surfaces of interior woodwork scheduled to receive stain or varnish finish with floss varnish reduced 25 percent with mineral spirits.

9902 .10 Field Quality Control

A. Field inspection and testing will be performed under provisions of Section 01400.

9902 .11 Cleaning

A. Clean work under provisions of 01700.

B. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

END OF SECTION

SECTION 10170
METAL TOILET COMPARTMENTS

10171 PART 1 GENERAL

10171.1 Section Includes

A. Toilet compartments, floor mounted, overhead braced.
B. Urinal Screens, wall mounted.
C. The following rooms receive metal toilet compartments: Lincoln Elementary rooms 134 & 135.

10171.2 References (including but not limited to)

A. ANSI A117.1 - Safety Standards for the Handicapped .
B. ASTM A167 - Stainless and Heat Resisting Chromium-Nikel Steel Plate, Sheet and Strip.
C. ASTM A424 - Steel Sheet for Porcelain Enameling.
D. ASTM A526 - Steel Sheet, Zinc-coated (Galvinized) by the Hot-Dip Ptocess, Commercial Quality.
E. FS RR-P-1352 - Partitions, Toilet, Complete.

10171.3 Submittals

A. Submit under provisions of Section 01300.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, door swings.
C. Product Data: Provide data on panel construction, hardware, and accessories.

10171.4 Regulatory Requirements

A. Toilet Compartments, Shields; shall conform with ANSI A117.1 requirements. Such reqirements shall supersede technical specifications in this section.

10171.5 Field Measements

A. Verify that field measements are as indicated on the shop drawings.

10171.6 Coordination

A. Coordinate work under provisions of Section 01039.
B. Coordinate the work with placement of support framing and anchors in wall.

10172 PART 2 PRODUCTS

10172.1 Acceptable Manufactures

A. Accurate Partitions Corporation.
B. All American Metal Corp.
C. Ampco Products, Inc.
D. Bobrick Washroom Equipment, Inc.
E. Capitol Partitions, Inc.
F. Commercial and Archirtectural Products, Inc.; Marlite.
G. Compression Polymers Group; Comtec Industries.
H. Crane Plumbint; Sanymetal.
I. General partitions Mfg. Corp.
J. Global Steel Products Corp.
K. Hadrian Inc.
L. Knickerbocker Partition Corporation.
M. Lambaton/Universal.
N. MASCO: Flush-Metal Partition Corp.
O. Metpar Corp.
P. Mills Company (The)
Q. Partition Systems, Inc.; Columbia Partitions
R. Santana Products, Inc.
S. Tex-Lam Manufacturing, Inc.
T. Turan Partition Corporation.
U. Weis/Robart Partitions, Inc.
V. Young Sales Corp.; DesignRite.

10172.2 Materials

A. Steel Sheet; ASTM A526, with G90 zinc coating. ASTM A167, Type 304 stainless steel.

10172.3 Accessories

A. Pilaster Shoe: Formed chromed steel with satin finish, ASTM A167 type 304 stainless steel with No. 4 finish, 3 inch high, with adjustable screw jack.
B. Head Rails: Hollow Aluminum tube, 1 x 1-5/8 inch size, with anti-grip strips and cast socket wall backets.
C. Attachments, Screws and Bolts: Stainless steel; tamper proof type, heavy duty extruded aluminum brackets.
D. Hardware: Chrome plated non-ferrous cast metal: Stainless steel:
    1. Pivot hinges, gravity type, adjustible for door close positioning.
    2. Nylon bearings.
    3. Thumb turn door latch with exterior emergency access feature
    4. Door strike and keeper with rubber bumber.
    5. Door pull for outswinging doors.

10172.4 Fabrication

A. Fabricate partitions in accordance with FS RP-P-1352.
B. Fabricate components of steel sheet as follows:
   1. Panel and Door Faces: 20 gage
   2. Pilaster Faces: 18 gage
   3. Reinforcement: 12 gage
C. Doors and Panels:
   1. Thickness: 1 inch
   2. Door Width: 24 inch
   3. Door Width for Handicapped Use: 36 inch, out-swinging.
   4. Height; 58 inch
D. Pilasters: 1-1/4 inch thick, of sizes required to suit cubicle width and spacing.
E. Door, Panel, and Pilaster Construction: Sheet steel face, pressure bonded to sound deadening core, form and close edges, miter and weld corners, gring smooth.
F. Internal Reinforcement: Provide in areas of attached hardware and fittings. Mark locations of reinforcement for partition mounted washroom accessories.
G. All panels facing a urinal shall be stainless steel sheet.

10172.5 Finishing

A. Clean, degrease, and neutralize panels.
B. Follow immediately with a phosphatizing treatment, prime coat and two finish coats baked enamel.
C. Single Color: Color as selected by Engineer.
D. Stainless Steel Surfaces: No. 4 finish (All panels facing a urinal).

10173 PART 3 EXECUTION

10173.1 Examination

A. Verify site conditions under provisions of Section 01039.
B. Verify correct spacing of and between plumbing fixtures.
C. Verify correct location of built-in framing, anchorage, and bracing.

10173.2 Installation

A. Install partions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
C. Maintain 12" inch (maximum) from finish floor to bottom of panels or 5'-0" from finish floor to top of panels.
D. Maintain 6" inches (maximum) from finish floor to bottom of doors or 5'-4" from finish floor to top of doors. Coordinate with Owner for exact heights.
E. Attached panel brackets securly to walls using anchor devices.
F. Attach panels and pilasters to brackets with tamper proof through bolts and nuts. Locate head rail joints at pilaster center lines.
G. Anchor urinal screen panels to walls with two (2) panel brackets.
H. Provide adjustment for floor variations with screw jack through steel saddles intergral with pilaster. Conceal ceiling fastenings with pilaster shoe.

I. Equip each door with two(2) hinges, one door latch, one coat hook and bumper; outswinging door with pull.
J. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.
K. Field touch-up of scratches or damaged enamal finish will not be permitted.
L. Replace damaged or scratched materials with new materials.

10173.3 Erection Tolerances

A. Maximum Variation From True Postion: 1/4 inch.
B. Maximum Variation From Plumb: 1/8 inch.

10173.4 Adjusting

A. Adjust work under provisions of Section 01700.
B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
C. Adjust hinges to position doors in full closed position when unlatched. Return out swinging doors to closeed position.
D. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10180
PHENOLIC TOILET COMPARTMENTS

10181 PART 1 GENERAL

10181.1 Section Includes

A. Solid phenolic core toilet compartments with institutional hardware. The followings rooms receive phenolic toilet compartments: High School/Middle School rooms 148, 149, 120, 123, 229, 230, 322 and 323,

10181.2 System Description

A. Partition Type: Floor mounted, overhead braced.
B. Partition Size: 48 inch high partitions mounted 15 inches above finish floor.
C. Barrier Free Requirements:
   1. Toilet Stall Compartment: Minimum inside clear dimensions of 60 inches by 60 inches.
   2. Urinal Screens: Minimum inside clear dimensions of 36 inches, centered on urinal.

10181.3 Submittals

A. Submit in accordance with General Requirements, Division 1.
B. Shop Drawings: Indicate Partition plan and elevation views, dimensions, details of wall, floor or ceiling supports, and door swings.
C. Samples: Submit charts illustrating full range of colors available.

10181.4 Warranty

A. Provide manufacturer's ten (10) year limited warranty in accordance with General Requirements, Division 1.

10182 PART 2 PRODUCTS

10182.1 Materials

A. Acceptable Manufacturers:
   1. Accurate Partitions Corp.
   2. Bobrick Washroom Equipment Inc.
   3. Bradley/Mills Partitions
   4. General Partitions Mfg. Corp
   5. Global Steel Products Corp

B. Panel Construction: Solid phenolic core, water resistant, with high pressure melamine color surface, Class A fire hazard classification, minimum ¾ inch panel thickness.
C. Panel Wall Brackets: Stainless steel, continuous type.
D. Fasteners: Stainless steel, tamper-proof.

10182.2 Hardware:

A. Hinges: Stainless steel, continuous piano type.
B. Latch and Keeper: Slide latch, door strike and keeper with rubber bumper.
C. Coat Hook: Cast alloy with rubber bumper tip.

10182.3 Fabrication

A. Fabricate panels, doors and pilasters without seams. All edges burnished.
B. Provide continuous aluminum strip (heat sinc) on bottom edge of doors and panels.
C. Pilasters: Formed stainless steel, 3 inches high.

END OF SECTION

SECTION 10440
INTERIOR IDENTIFICATION SIGNAGE

10441 PART I GENERAL

10441.1 Section Includes

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

B. Refer to the floor plan drawings for sign locations.

10441.2 Summary

A. This Section includes the following:

1. Interior acrylic plastic tactile signage.
2. Selected demo of existing interior signage and wall touchup repair as required.

10441.3 Submittals

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, art work, and Braille layout.

C. Samples for Initial Selection: For each type of sign material indicated that involves color selection.

D. Samples for Verification: For each type of sign, include the following Samples to verify color selected.

E. Qualification Data: For Installer.

F. Maintenance Data: For signage cleaning and maintenance requirements to include in maintenance manuals.

G. Replacement Instructions: Provide in writing, instructions to Owner on how to replace name inserts, turn around time required, etc.

10441.4 Quality Assurance

A. Source Limitations: Obtain each sign type through one source from a single manufacturer.

B. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.

10441.5 Project Conditions

A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

10442 PART 2 PRODUCTS

10442.1 Manufacturers

10442.2 Interior Panel Signs

A. General: Provide panel signs that comply with requirements indicated for materials, thickness, finishes, colors, designs, shapes, sizes and details of construction.

1. Produce smooth, flat panels sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch measured diagonally.

B. Manufacturer: Signs are based on Scott products. Additional approved manufacturers include the following:

1. The Supersine Company, (Div. of stamp-Rite, Inc.) 800-328-1988
2. Allen Marketing Products, Inc.
3. Metal Arts
4. ASI Sign Systems
5. Andco Industries Corp.
6. Southwell Company
7. Summit Advertising, Inc.
8. Detroit Marking Products
9. Engineer pre-approved manufacturer of product meeting or exceeding specifications.

C. Graphic content and style: Provide sign copy that complies with requirements, indicated below and in the sign schedule and drawings

for size, style, spacing, content, mounting height and location, material, finishes and colors of signage.

10443 PART 3 EXECUTION

10443.1 Examination

A. Examine all surfaces, areas and conditions with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

10443.2 Installation

A. General: Locate signs and accessories where indicated, using mounting methods of the types described and in compliance with the manufacturer's written instructions.

B. Wall mounted Panel Signs: Attach panel signs to wall surfaces using methods indicated below.

1. Vinyl-tape mounting: use double-sided very high bond (VHB) tape to adhere signs to smooth, non-porous surfaces. Do use for vinyl-coated or rough surfaces.

2. Mechanical fasteners: Use non-removable mechanical fasteners placed though pre-drilled holes in sign face, or through shim plate. Use proper anchors at masonry walls as recommended by manufacturer.

10443.3 Cleaning and Protection

A. After installation, clean soiled sign surface and protect from damage until acceptance by the Owner.

B. At locations that call for removal of existing signs, perform wall touch-up repair including filling holes with putty, etc.

10443.4 New ADA Signage as indicated on the attached schedule and details.

NEW ADA SIGNAGE - LINCOLN ELEMENTARY

Tag #	Door #	Sign Content	Sign Type	Remove Existing
				Room Sign
1	101-1	Library Room 101	1	Yes
2	101-2	Library Room 101	1	N/A
3	102-1	Mrs. Vanover Room 102	1	Yes
4	103-1	Mrs. C. Mansfield Room 103	1	Yes
5	104-1	Mrs. Darr Room 104	1	Yes
6	105-1	Primary Library Room 105	1	Yes
7	105-2	Primary Library Room 105	1	N/A
8	106-1	Mrs. Hill Room 106	1	Yes
9	107-1	Mrs. McCaulley Room 107	1	Yes
10	108-1	Preschool Mrs. E. Mansfield Room 108	1	Yes
11	108-2	Preschool Room 108	1	N/A
12	109-1	Mrs. Lake Room 109	1	Yes
13	110-1	Room 110	1	Yes
14	111-1	Room 111	1	N/A
15	111-2	Room 111	1	Yes
16	112-1	Mrs. Arredondo Room 112	1	Yes
17	113-1	Computer Lab Room 113	1	N/A
18	113-2	Computer Lab Room 113	1	Yes
19	114-1	Mrs. Kirkland Room 114	1	Yes
20	115-1	Title 1 Mrs. Turner Room 115	1	Yes
21	116-1	Mrs. Fitch Room 116	1	Yes
22	117-1	Mrs. Leffel Room 117	1	Yes
23	118-1	Mr. Daniels Room 118	1	Yes
24	119-1	Miss Brant Room 119	1	Yes
25	120-1	Mrs. McCarty Room 120	1	Yes
26	121-1	Ms. Scudder Room 121	1	Yes
27	122-1	Ms. Rockwell Room 122	1	Yes
28	123-1	Mr. Mitchell Room 123	1	Yes
29	124-1	Mr. McLouth Room 124	1	Yes
30	125-1	Mrs. Roberts Room 125	1	Yes
31	126-1	Mrs. Lawrence Room 126	1	Yes
32	127-1	Room 127	1	Yes
33	128-1	Mrs. Reilly Room 128	1	Yes
34	129-1	Mrs. L. Godfrey Gymnasium	1C, sim	Yes
35	129-2	Mrs. L. Godfrey Gymnasium	1C, sim	N/A
36	130-1	Girls, International Symbol	APGRL69	N/A
37	131-1	Boys, International Symbol	APBOY69	N/A
38	161-1	Cal McLouth, Building Engineer	1A sim	Yes
39	132-1	Girls, International Symbol	APGRL69	N/A
40	133-1	Boys, International Symbol	APBOY69	N/A
41	134-1	Men, International Symbol, accessible symbol	APMENA69	Yes
42	135-1	Women, International Symbol, accessible symbol	APWOM69	N/A
43	136-1	Copy Room	2	N/A
44	137-1	Storage	2	Yes
45	139-1	Administrative Offices	1B sim	N/A
46	153-1	Mrs. Godfrey, Building Principal	1C sim	Yes
47	154-2	Mrs. Sheeley	1A sim	Yes
48	140-1	Office	2 sim	Yes
49	159-1	Miss Corner Volunteer Coordinator	1C sim	Yes
50	149-1	Boiler Room	1C sim	N/A
51	147-1	Staff Unisex, International Symbols	APRES69	N/A
52	144-1	Staff Lounge	1C sim	Yes
53	323-1	LISD Personnel	1A sim	Yes
54	142-1	Office	2 sim	N/A
55	158-1	No new sign, but scope of work to include sign removal on door	N/A	Yes

NEW ADA SIGNAGE - HIGH SCHOOL/MIDDLE SCHOOL

Tag #	Door #	Sign Type
1	120-1	APMEN69
2	121-1	APFAM69
3	122-1	APFAM69
4	123-1	APWOM69
5	229-1	APWOMA69
6	230-1	APMENA69

(TEACHER NAME)

ROOM (###)

(ROOM # IN BRAILLE ON FRAME)

4"x8" SCOTT SERIES S7000 CONTOUR FRAME

1A SIM.) OMIT BRAILLE, OMIT TIGER LOGO IF SPACE IS LIMITED

1B SIM.) ROOM FUNCTION IN BRAILLE IN LIEU OF ROOM #

1C SIM.) ROOM FUNCTION IN BRAILLE IN LIEU OF ROOM #. ROOM FUNCTION IN LIEU OF ROOM #.

SIGN TYPE #1

(ROOM OR TEACHER NAME)

(ROOM # IN BRAILLE ON FRAME)

2½"x10" SCOTT SERIES S7000 CONTOUR FRAME

2 SIM.) OMIT BRAILLE

SIGN TYPE #2

SECTION 10800
TOILET AND BATH ACCESSORIES

10801 PART I GENERAL

10801.1 Section Includes

A. Toilet and washroom accessories.
B. Grab bars, mirrors and shelves.
C. Attachment hardware.

10801.2 References

A. ANSI A117.1 - Safety Standards for the Handicapped.
B. ASTM A123 - Zinc (Hot-Dip Galvanized) coatings on Iron and Steel Products.
C. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
D. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
E. ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
F. ASTM B456 - Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
G. NEMA LD-3 - High Pressure Decorative Laminates.

10801.3 Submittals

A. Submit under provisions of Section 01300.
B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
C. Manufacturer's installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

10801.4 Regulatory Requirements

A. Toilet accessories shall conform with Michigan Barrier Free Requirements.

10801.5 Field Measurements

A. Verify that field measurements are as indicated on product data.

10802 PART 2 PRODUCTS

10802.1 Manufacturers

A. Bobrick Washroom Equipment, Inc.

B. Other acceptable manufacturers offering equivalent products.

1. American Specialties, Inc.
2. McKinney / Kidde, Inc.
3. Bradley Corporation
4. A J Washroom Accessories Inc.

10802.2 Accessories

A. Accessories to be included in Base Bid and Installed by contractor:

1. Toilet Grab Bars: One piece, 1 1/2 inch diameter, 36” and 42” 2 piece grab bar constructed of 18 gage, type 304 stainless steel with peened grip surface, welded construction. Provide concealed mounting flange and cover. Equal to Bobrick Washroom Equipment, Inc. Model B-6806.
2. Shelves: Stainless steel, Model B-298, size and locations as shown on the drawings.
3. Mirrors: Surface mounted angle framed mirror; constructed of Type 304 stainless steel with concealed wall hanger of 20 gage galvanized steel. Equal to Bobrick Washroom Equipment, Inc. Model B-290; size as shown on drawings.

10802.3 Materials

A. Sheet Steel: ASTM 1366.

B. Stainless Steel Sheet: ASTM A167, Type 304.

C. Tubing: ASTM A269, stainless steel.

D. Adhesive: Two component epoxy type, waterproof.

E. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.

F. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

10802.4 Fabrication

A. Weld and grind joints of fabricated components, smooth.

B. Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches or dents.

C. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges. Form bar with 1 1/2 inches clear of wall surface. Peened grip surfaces.

D. Shop assemble components and package complete with anchors and fittings.

E. Provide steel anchor plates, adapters, and anchor components for installation.

10803 PART 3 EXECUTION

10803.1 Examination

A. Verify site conditions under provisions of Section 01050.

B. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings.

C. Verify exact location of accessories for installation.

10803.2 Installation

A. Install accessories in accordance with manufacturers' instructions.

B. Install plumb and level, securely and rigidly anchored to substrate.

END OF SECTION

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 11060
THEATER AND STAGE EQUIPMENT

11061 PART 1 – GENERAL

11061.1 RELATED DOCUMENTS

A. General Conditions, Supplementary Conditions and General Requirements, are applicable to this section.

11061.2 SCOPE OF WORK

A. The purpose of these specifications is to furnish functional and operational criteria; to outline quantitative requirements; to provide standards of quality in materials and workmanship; and to establish procedures and obligations concerning bidding, fabrication, and installation of the stage rigging systems.

B. All material, equipment, and services shall be provided as specified herein and shown on the drawings. These include the preparation and submission of shop drawings for approval by the Engineer prior to fabrication or installation; the verification of dimensions, conditions and clearances at the job site, and reporting conditions and clearances at the job site, and reporting variations and obstructions to the Engineer; the fabrication, delivery, and installation in accordance with these specifications and pertinent drawings; and inspection and adjustment of the completed installation.

C. All bidders shall fully inform themselves of the conditions under which the work is to be performed, the site of the delivery, installation, and all other relevant matters concerning the work to be performed, and the bidder, if awarded the Contract, shall not be allowed any extra compensation by reason of any matter or thing concerning which such bidder might have fully informed himself prior to the bidding. The Contractor for the work shall visit the site, check, and verify all dimensions to coordinate the equipment with the structure and shall furnish all auxiliary steel and incidental items to result in an installation complete in all details whether or not such incidental items are specifically enumerated herein

D. All equipment shall be furnished in strict accordance with the specifications and be installed in complete working order ready for use. The Stage Equipment Contractor shall instruct representatives of the school in proper operation of all equipment furnished as part of his contract. Immediately following the first six month period, subsequent to final approval of the installation, the Stage Equipment Contractor shall make the necessary mechanical adjustments to the rigging items as directed by the Engineer or his representative. Operating and maintenance manuals shall be provided for all running rigging.

If any bidder for the proposed contract is in doubt as to the true meaning of any part of the drawings, specifications or other proposed contract documents, he may submit to the Engineer a written request for interpretation thereof. The bidder submitting the request will

be responsible for its prompt delivery. Any interpretation of the proposed documents will be only by addendum duly issued. A copy of such addendum will be furnished to each person receiving contract documents. No request for interpretation will be accepted or a reply given after ten (10) days prior to the date for opening bids.

11061.3 WORK IN THIS SECTION

A. Tracks

1) Additional track systems for masking legs with connecting accessories.

B. Curtains

1) Stage drapery installed as scheduled, trimmed, and all flameproofed.

2) Drapery protective covers.

11061.4 SUBMITTALS

A. Submit three (3) prints of shop drawings to Engineer for approval. Obtain approval of drawings prior to proceeding with manufacturing.

B. Preliminary arrangement drawings including auxiliary steel are to be submitted to the Engineer not later than sixty (60) days after award of Contract. Shop and field connections of auxiliary steel items shall be clearly distinguished and complete information on connections to other work shall be given. Following approval of the preliminary drawings and prior to beginning fabrication, this Contractor shall submit complete shop drawings of the rigging components including:

1) Mechanical Assembly Drawings
2) Mechanical Detail Drawings
3) Mechanical General Layout
4) Component Equipment Drawings
5) Erection Plans and Diagrams
6) Miscellaneous Details and Assembly Drawings

C. Mechanical assembly drawings shall show detailed sizes and weights of all components, equipment, supports, and linkages. Assembly drawings shall show sufficient detail to serve as a basic record for maintenance.

D. Assembly drawings shall have a reference listing for all materials, components, equipment, and any special equipment furnished.

E. Mechanical detail drawings shall show all details necessary for fabrication of all specially designed components, linkages, and supports.

F. Mechanical general layouts shall show all mechanical equipment locations, connections to building structure, linkages, travels and travel relationships between adjacent installations and between adjacent structures.

G. Component equipment drawings shall be Manufacturer's approved drawings or catalog cuts showing weight dimensions, and capacities of mechanical components.

H. Erection plans and diagrams shall give relative locations of various members and overall dimensions with reference to the preliminary drawings including auxiliary steel.

I. Miscellaneous details and assembly drawings shall give lengths, widths, and sizes of all members, connection details, location, type and size of bolts, rivets, welds, and other connections together with materials to be used.

J. Shop drawings shall be made in conformity with the best modern practice and all design shall reflect a requirement for minimum ongoing institutional maintenance. Approval rendered on shop drawings shall not be considered as a guarantee of measurements of building conditions. Where drawings are approved, said approval does not mean that drawings have been checked in detail, and does not in any way relieve the Contractor from his responsibility of necessity to furnish material or perform work as required by the Contract Specifications.

K. Failure by the Contractor to submit shop drawings in ample time for checking shall not entitle him to an extension of contract time, and no claim for extension by reason of such default will be allowed.

11061.5 GENERAL REQUIREMENTS

A. All items included in this specification shall be furnished and installed by a single contractor who shall have sole responsibility for proper operation of all equipment involved.

B. The contractor must maintain and operate his own shops and fabricate or assemble all components with the exception of standard hardware, materials, and equipment. Subletting work at the job site, except for incidental miscellaneous steel work, shall not be allowed.

C. All work done under this contract shall conform to applicable local, state, and national codes.

D. The Contractor shall provide insurance covering damages to, or losses of, the equipment during shipment and installation, and covering damages of persons, premises, or equipment which are the result of assembly or installation procedures at the job site.

11061.6 QUALIFICATIONS

A. The rigging equipment comprehended herein shall be as specified or by equal manufacturers listed below. Materials and equipment which equal or exceed the

quality specified as manufactured and installed by any of the following is acceptable for the work comprehended in this section.

Tiffin Scenic Studios 146 Riverside Drive Tiffin OH 44883	Pook Diemont and Ohl 701 East 132 Street Bronx NY 10454
Chicago Spotlight Inc. 1658 W. Carroll Street Chicago IL 60612	Atlanta Rigging Systems 1270 Tacoma Drive Atlanta GA 30318

B. Other manufacturing contractors desiring consideration for approval shall submit their request to the Engineer in writing.

11061.7 STANDARDS AND SUBSTITUTIONS

A. Throughout this specification, most details on construction, fabrications, and installation methods and techniques are spelled out for various rigging components including but not limited to weights, tolerances, finishes, metallurgical analysis, capacities, anchoring, clamping, alignment, and arrangement; these shall be incorporated in the work without substitution or alterations as requirements of the design intent relating to safety, performance, aesthetics, longevity, and minimal institutional maintenance.

B. Dimensions listed herein relating to the above categories shall be regarded as actual and not nominal. Only where a dimension is specifically identified as nominal shall an interpretation be such.

C. In instances where specific requirements for rigging components are more stringent and require precautions, procedures, or refinements exceeding building codes or standards such specific requirements shall supersede these codes and standards as basic to the design intent for additionally contributing toward equipment performance and personal safety under both normal use as well as abnormal use, abuse, and human error as can reasonably be anticipated.

D. Wherever a named material, or equipment is listed (including manufacturer, brand, model, catalog number, etc.) such proprietary mention is used to indicate the quality required by the design. Proprietary brands, models, etc. of other manufacturers may be used upon, and only upon, the following conditions:

1) That, in the opinion of the Engineer (whose decision shall be final) the proposed brand or equipment item is fully equal in design, materials, construction, workmanship, performance, finish, etc. to the item proprietary named. No compromise in quality level, however small, is acceptable.

2) That no oral request for "approved equal" materials will be entertained and no oral response proffered.

3) That it be understood the eventual use of materials or installation techniques other than those specified without written approval of the Engineer as "approved equal" shall constitute a violation of the contract and that the

Engineer shall have the right to require the removal of such material or the modification of such installation technique or both, and the replacement thereof with the specified materials or installation techniques or both, at the Contractor's expense.

11061.8 WORKMANSHIP

A. The installation workmanship shall provide straight, plumb, true, and aligned components throughout. All connections shall be tight fitting with a minimum safety factor of eight (8) and all arranged in an orderly manner. The mechanical fabrication of the rigging and hardware and the mechanical installation shall possess the necessary properties to withstand stresses of tension compression, flexure, shear, and torsion which may be anticipated being imposed on one or more of the components; and all shall be related to (1) safety, (2) ease of operation, (3) quietness of operation, and (4) service life. The standards of quality and design covering the equipment and fabrication, plus the installation technique required are established on this basis; and the decision of the Engineer in determining the acceptability of equipment items, installation technique, and workmanship shall be final.

B. The Rigging Contractor shall conform to the best trade practices, fabrication and installing all items in accordance with Manufacturer's recommendations and Engineer’s direction, and consult and coordinate with trades doing adjoining work.

C. During the course of his work, the Rigging Contractor shall daily remove to collections points at the job site all loose trash and scrap materials.

D. Installation shall be completed with all members and materials and all bolts, nuts, washers, clips, fittings, supports, or other items required for attaching all equipment specified to the existing construction.

E. The Rigging Contractor shall do all required cutting, drilling, tapping and fitting to properly install and secure his work in place. Cutting or drilling existing structural work shall have prior approval of the Engineer.

F. The mechanical fabrication and workmanship shall incorporate neat and mechanically acceptable practices such as clean drilled and punched holes without flash, hand smooth finish for all sheared, machined, and cut edges, and proper fit of component and contiguous parts without irregularity where matching is intended. Welding shall meet qualification of A.I.S.C. manual and shall be without spatter and other evidence of poor practice. All moving parts shall have specified tolerances, shaft sizes, bearings, mountings, connections, and accessories coordinated into the work in a manner acceptable to the Engineer. No wood construction or equipment shall be incorporated into the work excepting as many be set forth in the specifications.

G. The fabrication of all equipment shall incorporate only new and unused materials. This includes all metal components in various shapes required such as plate, rod, castings, structural, stampings, forging, clamps, bolts, bearings, chain, pipe, sleeve clips, cables, and all other accessories not mentioned.

H. The installation cost included in this proposal shall be based upon the use of experienced riggers.

11061.9 INSPECTION AND TESTING

A. Final inspection shall be made by the Engineer, or his appointed representatives, within ten (10) days following receipt in writing of notification from the Contractor that the installation is completed. If inspection reveals any detail of construction, fabrication, or installation not in strict accord with the specification and contract requirements, approval and payment will be withheld and the Contractor will be given thirty (30) days to replace the rejected items with those conforming to specification requirements. In addition to the final inspection, the Engineer or his appointed representative may make preliminary inspection of various equipment components during the course of the installation, and he shall be allowed access to any and all materials at the site for eventual incorporation in the work. Any such preliminary inspection shall not be construed as eliminating the possible rejection of various components during final inspection detailed above.

B. The completed installation of all rigging equipment with draperies properly installed shall be tested and operated for the approval of the Engineer. Any workmanship or materials found to be defective, improperly placed, not in strict conformity with the specifications, or defaced or injured through the action of fire or the elements, through usage by the Contractor or his employees, or from any other cause shall be removed immediately from the premises when directed by the Engineer and satisfactory materials or work substituted therefore without delay. This shall include making good the work of other Contractors destroyed or damaged by delivery or installation, or by such removal or replacement. The cost of the above replacements shall be borne by the Contractor responsible for the defective work or material.

C. In the event that rejected materials cannot be replaced before occupancy and use of the building, the rejected items shall be allowed to remain in use until replaced at no expense to the Owner.

D. The Engineer, or his appointed representative, shall be the sole judge of the quality of materials furnished and the character of the work performed.

11061.10 PRODUCT SAFETY AND GUARANTEE

A. The safety parameters set forth in this section of the specifications are intended to reflect safeguards and precautions related not only to normal use of the equipment under ideal operating and loading conditions but, additionally to anticipate equipment misuse, human error, and misjudgment. Pursuant to the above and as "a condition precedent" for minimizing product liability claims before they occur, each bidder by signature affixed to his proposal form as an essential contract requirement attest as follows reflecting mandates of the Consumer Product Safety Commission:

1) He has not on previous stage rigging work under his contractual responsibility within the preceding ten-year period substituted cast iron components for supporting or carrying static or dynamic overhead loads

under stresses of tension and/or impact where malleable iron or steel was specified for such components.

2) The load bearing components include but are not limited to arbor top or bottom members and hook clamps for attaching single or head blocks to the rigging steel.

and/or

3) He has reported all such breach of contract infractions as listed above to the Consumer Product Safety Commission, as required by the Act (Public Law 92-573) and has either replaced or remodeled such work or reimbursed the Owner(s) in suitable amount for allowing such replacement or remodeling being done by others and all as approval by the Commission.

B. The work shall be fully guaranteed - with exception of normal wear - for a period of one (1) year after final acceptance and payment. Any items showing evidence of defective materials or workmanship (including installation workmanship) in the opinion of the Engineer shall be replaced within thirty (30) days after notification, and without cost to the Owner.

11062 PART 2 – PRODUCTS

11062.1 FABRICS

A. All fabrics of their various kinds and colors shall each be from one (1) and the same dye lot. All colors and designs are to be as selected by the Engineer. When materials of one (1) color exceed limit of one (1) dye lot, the balance must be identically matched with the original lot. No. “run of the mill” usage of colors will be acceptable.

B. All fabrics shall be inherently flame resistant CS polyester for compliance with all applicable codes. Spray method of flameproofing is unacceptable. This contract shall furnish flameproofing certificates giving name of flameproofing chemical used, identification of flameproofer, method of flameproofing used, and date.

1) 25 -ounce Prestige velour shall be in stock color as furnished by KM Fabrics Inc., 2 Waco Street, Greenville, SC 29611; or approved equal by JB Martin Ltd.

2) 15 –ounce PD cloth shall be in stock color as furnished by Dazian, 124 Enterprise Avenue, Secaucus, NJ 07094; or approved equal by Rosebrand, Inc.

3) Weblon shall be in stock color black as furnished by Astrup Co. 2937 West 25th Street, Cleveland OH 44113.

11062.2 CHAINS, CABLES, ROPES, AND CONNECTIONS:

A. Chains

1) Weighted chain for bottom hems where required to be No. 8 jack chain - zinc plated.

2) Batten connection trim chains to be 1/4” plated proof coil chain. Trim chains to have safety type 1/4” anchor shackles (forged) having forged pin with hitch pin clip.

B. Rope

1) Track operating lines shall be number 12 line with cotton sheath.

2) Free ends of rope shall be whipped and separately stopped to standing part with Scotch No. 33 electrical tape.

C. Connections

1) Counterweight running line connections shall be made using Nicopress oval sleeves, as furnished by the National Telephone Supply Company, applied in conformity with manufacturer's instructions. Both ends of all running lines shall terminate with heavy patterns 1/4" thimbles. Cable connections at arbor shall be with safety type 1/4" anchor shackle (forged) having lock clip.

2) Cable ends to be properly taped.

11062.3 PIPE AND PIPE BATTENS

A. Counterweight Battery - 1-1/2” I.D. Schedule 40 black.

B. Track Backbone – 1” I.D. Schedule 40 black.

C. Pipe Assembly

1. Each batten shall incorporate full batten sections with only one (1) partial section permitted.

2. Internal tight fitting sleeve spliced joints 18" long equally spaced each side of joint. Welded on one end and held with two (2) 3/8” bolts on the other end. Sleeve splice member to be 5/32" wall steel tube.

3. Weight pipe shall have end caps.

11062.4 DRAPERY PROTECTIVE COVERS

A. Protective covers shall be made from vinyl lined fabric with three (3) grommets in each vertical edge for a total of six (6) grommets in each. Three (3) snap hooks will connect each vertical edge of the protective cover.

B. Vinyl fabric will be sized to wrap around the drapery it must protect.

C. Covers will be wall mounted.

11062.5 EQUIPMENT LISTING

A. All incidental items required including auxiliary steel connections, and required accessories to provide a properly aligned installation free from defects in workmanship and materials without claim for extra materials, even though not specifically listed herein.

11062.6 TRACKS

A. Traveler tracks shall be made from no lighter than 13 gauge (.095) steel with double parallel raceway and length attached to track on approximately 5'0" centers with die formed steel clamps. Single carriers are to be double-wheel style and masters of four-wheel construction, all incorporating end-stacking links and resilient rubber tube silencer spacer with 1/4" wall thickness and an outside diameter of approximately 3/4" to allow free travel for full 3/8" diameter operating line.

1) Traveler Tracks

a) Front Curtain, Mid-Stage, and Rear Traveler – reuse existing

b) Operating line shall be replaced.

2) Leg Tracks

a) Leg Tracks – extend existing tracks to within 4” of side walls

b) Four (4) extensions to the existing leg tracks required.

3) Acceptable Manufacturers

a) Traveler tracks shall be Continental No. 60 Track by Tiffin Scenic Studios, Inc. Atlas, Silk Model 401S by H & H Specialties, ADC Model 281 by Automatic Devices Company.

11062.7 STAGE DRAPERY

A. Sewing and Fabrication Instructions

1) All drapery as removed from bolts shall be tabled across an inspection window for detecting flaws and imperfections which shall be cut out and not incorporated in the finished work.

2) Fabric panels shall run full height of the various sections without horizontal seams and be box pleated at the top in fullness as listed exclusive of turnback facings. Plaits shall be on face side of drapery and reinforced across top with 3-1/2" nylon webbing. Webbing shall be sewn to top of drapery with four (4) runs of stitching with dual runs 1-1/2" apart, using industrial style sewing machine and no less than H30 heavy industrial thread. Grommets shall be so located that no horizontal stitching is cut or severed and shall be located on each plait on approximately 1'0" centers.

3) Each upper corner of each traveler section shall have double grommets precisely arranged to fit double chains of master carriers regardless of whether drapery section is used right or left stage.

1. Bottom edge of face fabric shall be within one-quarter (1/4) inch parallel with top edge of drapery for true hanging across full width.

2. Prior to sewing the bottom hem, the otherwise completed drapery sections shall be hung full height to their finished width and allowed to hang unmolested for two (2) weeks minimum after which the bottom shall be scribed and hemmed to the finished height specified.

3. After the sewing is completed, the drapery shall be folded at the vertical seams in approximately 3'0" wide increments and allowed to lay full length until transported to the installation site for promptly hanging to various tracks and battens.

4. Operating side of traveler and legs sections shall have heavy canvas pouch with strain relief chains for carrying floor block when drapery is flown.

5. Base Bid Items and Sizes:

a. Front Curtain to be made of inherently flame retardant Prestige velour, in stock color as selected.

i. Front curtain in two (2) sections.

ii. Fullness 50% - box pleated.

iii. Bottom hem 5” deep with No. 8 zinc plated jack chain weighted in separate pocket inside hem.

iv. 3-1/2” nylon webbing at top.

v. Brass grommets and plated steel S-hooks on 1’0” centers across top.

vi. One-half width turnback facing each vertical edge, each section.

vii. Finished size each section – 15’-0” high by 25’0” wide.

b. Valance fabricated in 50% fullness as front curtain above, except no chain weighted in 3” bottom hem and 2” side hems, in lieu of turnback facing.

i. Finished size 5'-0” deep by 49’-0” wide.

c. Mid-Stage Curtain Traveler to be made of inherently flame resistant PD cloth, in stock color black. Fabricated in two (2) equal sections.

i. Fullness 50% - box pleated.

ii. Bottom hem 5” deep with No. 8 zinc plated jack chain weighted in separate pocket inside hem.

iii. 3-1/2” nylon webbing at top.

iv. Brass grommets and plated steel S-hooks on 1’0” centers across top.

v. 8” turnback facing each vertical edge each section.

vi. Finished size each section – 17’3” high by 24’0” wide.

d. Rear Traveler to be made of inherently flame resistant PD cloth, in stock color black. Fabricated in two (2) equal sections.

i. Fullness 50% - box pleated.

ii. Bottom hem 5” deep with No. 8 zinc plated jack chain weighted in separate pocket inside hem.

iii. 3-1/2” nylon webbing at top.

iv. Brass grommets and plated steel S-hooks on 1’0” centers across top.

v. 8” turnback facing each vertical edge each section.

vi. Finished size each section – 16’8” high by 29’0” wide.

e. Legs No. 1 and 2 (four (4)) total) to be made of inherently flame resistant PD cloth, in stock color black.

i. Fullness 50% - box pleated.

ii. Bottom hem 5” deep with No. 8 zinc plated chain weighted in separate pocket inside hem.

iii. 3-1/2” jute webbing at top.

iv. Brass grommets and S-hooks on 1’0” centers across top.

v. 2” side hems.

vi. Finished size each leg, 16’3” high by 8’0” wide

f. Two (2) Masking Borders - each made of inherently flame resistant PD cloth, in stock color black.

i. Fullness 50% - box pleated.

ii. Bottom hem 3” deep - no chain weighted.

iii. 3-1/2” BFM jute webbing at top.

iv. Brass grommets and cotton tie-lines on 1’0” centers across top.

v. 2” side hems.

vi. Finished size each border, 4'-9” deep by 48’-0” wide.

g. One (1) pair of large protective covers to enclose Main Curtain and Midstage travelers

i. Sewn flat

ii. All hems 2”

iii. Brass grommets and snap hooks spaced evenly on each vertical edge, three (3) required each edge.

iv. Attach to proscenium wall.

v. Finished size each large cover, 4’8” high by 7’0” wide.

h. Two (2) pair of small protective covers to enclose Legs.

i. Sewn flat

ii. All hems 2”

iii. Brass grommets and snap hooks spaced evenly on each vertical edge, three (3) required each edge.

iv. Attach to stage left and stage right walls.

v. Finished size each small cover, 4’8” high by 2’0” wide.

i. One (1) pair of medium protective covers to enclose Rear Traveler

i. Sewn flat

ii. All hems 2”

iii. Brass grommets and snap hooks spaced evenly on each vertical edge, three (3) required each edge.

iv. Attach to upstage wall.

v. Finished size each small cover, 4’8” high by 4’0” wide.

11063 PART 3 – EXECUTION

11063.1 INSTALLATION

A. All items in this section shall be installed in accordance with the manufacturer’s written instructions and approved shop drawings for each product specified and for those operations not specifically covered in these specifications.

B. Installation specifications (as required) have been included in the previous Part 2 specifications, accompanying the product items.

C. Screens shall be installed in accordance with the manufacturer’s instructions.

11063.2 INSTALLATION PERSONNEL

A. Installation of all items shall be supervised by the contractor’s own experienced superintendent having extensive experience in installing work of this kind.

1) Superintendent shall be an Entertainment Technician Certification Program (ETCP) certified rigger in Theatre.

a. Rigging and Drapery Contractor shall provide the Engineer with a copy of the superintendent's ETCP Theatre certification and shall make a copy of this certification available on the job site for the length of the installation.

2) An ETCP Theatre certified rigger shall be present at all times during the installation.

3) The same individual shall remain the superintendent throughout the installation of the rigging system until work is completed excepting the intervention of circumstances completely beyond the control of the Rigging and Drapery Contractor.

END OF SECTION

SECTION 12300
LAMINATE CLAD CASEWORK, COUNTERTOPS & SOLID SURFACE TRIM

PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Laminate clad classroom casework (Lincoln Elementary)
B. Solid surface countertops (Lincoln Elementary)
C. Solid surface trim at mechanical and electrical devices (Lincoln Elementary and HS/MS).
D. Laminate class casework (HS/MS)

1.02 EXCLUDED WORK:
A. Labeled laminate countertop in the HS/MS room 102 shall be included in Spec Section 08340.

1.03 DEFINITIONS
A. Identification of casework components and related products by surface visibility.
1. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass insert doors and/or acrylic doors.
2. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors.
3. Exposed Ends: Any storage unit exterior side surface that is visible after installation.
4. Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.
5. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.
6. Concealed Surfaces: Any surface not visible after installation.

1.04 QUALITY ASSURANCE
A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
B. Manufacturer: Provide products certified as meeting or exceeding ANSI-A 161.1-1998 testing standards.

1.05 SUBMITTALS
A. Comply with Section 01330, unless otherwise indicated.
B. Product Data: Manufacturer's catalog with specifications and construction details.
C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
1. Include section drawings of typical and special casework, work surfaces and accessories.
2. Indicate locations of plumbing and electrical service field connection by others.

1.06 PRODUCT HANDLING

A. Deliver completed laminate clad casework, solid surface countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 25 percent to 55 percent.

B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 WARRANTY

A. All materials and workmanship covered by this section will carry a five (5) year warranty from date of acceptance.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Manufacturer:
   1. TMI Systems Design Corporation.
      a. Drawings and specifications are based on manufacturer's literature from TMI SYSTEMS DESIGN CORPORATION, 50 South Third Avenue West, Dickinson, North Dakota, 58601, Phone: 800-456-6716, fixed modular, casework and accessories.
      b. Other manufacturers shall comply with the minimum levels of material and detailing indicated on the drawings or as specified. Other approved manufacturer's are as follows:
         1. LSI Corporation
         2. Case Systems
         3. Stevens Industries
         4. Wood Metal Industries

2.02 MATERIALS

A. Core Materials:
   1. Particleboard up to 7/8 inch thick: Industrial Grade average 47-pound density particleboard, ANSI A 208.1-1999, M-3.
   2. Particleboard 1 inch thick and thicker: Industrial Grade average 45-pound density particle-board, ANSI A 208.1-1999, M-2.
   3. Medium Density Fiberboard 1/4 inch thick: Average 54-pound density grade, ANSI A208.2.

B. Decorative Laminates:
   1. High-pressure decorative laminate VGS (.028), NEMA Test LD 3-2000.
   2. High-pressure decorative laminate HGS (.048), NEMA Test LD 3-2000.
   3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-2000.
   4. High-pressure cabinet liner CLS (.020), NEMA Test LD 3-2000.
   5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-2000.
   6. Thermally fused melamine laminate, NEMA Test LD 3-2000, color matched with Wilsonart® Frosty White.

C. Laminate Color Selection: Maximum 1 color per unit face and 3 colors per project. (See Color Selection in section 3.05).

D. Edging Materials:
   1. 1mm PVC banding.

2. 3mm PVC banding, machine profiled to 1/8 inch radius.

2.03 CABINET HARDWARE

A. Hinges:
   1. Five knuckle, epoxy powder coated, institutional grade, 2-3/4 inch overlay type with hospital tip. 0.095 inch thick. ANSI-BHMA standard A156.9, Grade 1.
      a. Doors 48 inches and over in height have 3 hinges per door.
      b. Magnetic door catch with maximum 5 pound pull provided, attached with screws and slotted for adjustment.

B. Pulls:
   1. Door and drawer front pulls, are epoxy powder coated metal wire, 96mm spacing on screws. Pull design shall comply with the Americans with Disability Act (ADA).

C. Drawer Slides:
   1. Regular, kneespace and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.
   2. File: Full extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.

D. Adjustable Shelf Supports:
   1. Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1 inch thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.

E. Locks:
   1. Removable core, disc tumbler, cam style lock with strike.
   2. Elbow catch or chain bolt used to secure inactive door on all locked cabinets.

2.04 FABRICATION:

A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.

B. All casework panel components to be finished precisely to size and squareness within 0.3mm utilizing a sizing process to ensure strict dimensional quality and structural integrity in the final fabricated product.

C. Cabinet Body Construction:
   1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets.
      a. Tops, bottoms and sides of all cabinets are particleboard core.
   2. Cabinet backs: 1/2 inch thick particleboard core.
      a. Exposed back on fixed or movable cabinets: 3/4 inch thick particleboard with the exterior surface finished in VGS laminate as selected.

b. Flexible rail mounted cabinet backs: 3/4 inch thick particleboard structurally doweled into cabinet sides and top panels.

3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch thick particleboard. Base is 96mm (nominal 4 inch) high unless otherwise indicated on the drawings.
4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top and a stretcher at the front, attached to the sides. Back to be split removable access panel.
5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.
6. Exposed and semi exposed edges.
   a. Edging: 1mm PVC.
7. Adjustable shelf core: 3/4 inch thick particleboard up to 36 inches wide, 1 inch thick particleboard over 36 inches wide.
   a. Front edge: 1mm PVC.
8. Interior finish, units with open Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.
9. Interior finish, units with closed Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.
10. Exposed ends:
    a. Faced with VGS high-pressure decorative laminate.
11. Wall unit bottom:
    a. Faced with thermally fused melamine laminate.
12. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), are not permitted.

D. Drawers:
1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with thermally fused melamine doweled and glued into sides. Top edge banded with 1mm PVC.
2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with thermally fused melamine, screwed directly to the bottom edges of drawer box.
3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with thermally fused melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.

E. Door/Drawer Fronts:
1. Core: 3/4 inch thick particleboard.
2. Provide double doors in opening in excess of 24 inches wide.
3. Faces:
   a. Exterior: VGS High-pressure decorative laminate.
   b. Interior: High-pressure cabinet liner CLS.
4. Door/drawer edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

F. Miscellaneous Shelving:
   1. Core material: 3/4 inch or 1 inch thick particleboard.
   2. Exterior: VGS High-pressure decorative laminate.
   3. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

2.05 SOLID SURFACE COUNTERTOPS & TRIM:

A. Wilsonart Contract, Dupont Corian, Samsung Staron, or equal, ½" thickness.

PART 3- EXECUTION

3.01 INSPECTION:

A. The casework contractor must examine the job site and the conditions under which the work under this section is to be performed, and notify the building owner in writing of unsatisfactory conditions. Do not proceed with work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION:

A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION:

A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.
B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.
C. Repair minor damage per plastic laminate manufacturer's recommendations.

3.04 CLEANING:

A. Remove and dispose of all packing materials and related construction debris.
B. Clean cabinets inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building owner.

3.05 COLOR SELECTION:

A. Laminate Color Selection:
   1. To be selected from the full range of Wilsonart® stock color charts for cabinet faces, exposed ends, open interiors, and countertops. Thermally fused melamine laminate matched to Wilsonart® Frosty White color.
B. Hinge and Pull Color Selection:
   1. To be selected from stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Black and Chrome.
C. Miscellaneous Hardware Color Selection (support brackets, table frames, rail):
   1. To be selected from stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey and Black.
D. 1mm PVC Edge Banding Color Selection:
   1. To be selected from 1mm PVC edgings available in a variety of solid, pattern and woodgrains matching laminate colors*.

E. 3mm PVC Edge Banding Color Selection:
   1. To be selected from 3mm PVC stock colors (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey and Black.

F. Solid surface material: To be selected from range of stock color charts.

END OF SECTION

SECTION 12380
DISPLAY CASEWORK

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK
A. This section includes Recessed Display Cases

1.02 REFERENCED STANDARDS
A. ASTM-E 84
B. ASTM B221

1.03 SUBMITTALS
A. Shop drawings: Provide shop drawings for each type of freestanding display or trophy case required.
B. Product Data: Provide technical data for materials specified. Include Material Safety Data Sheets, when applicable.
C. Samples:
   1. Manufacturer's color charts
   2. Composition samples of material and trim to illustrate finish, color and texture.
D. Manufacturer's Instructions: Provide Manufacturer's installation instructions.

1.04 OPERATION & MAINTENANCE
A. Include data on regular cleaning, stain removal, and precautions.

1.05 REGULATORY REQUIREMENTS
A. Conform to applicable code for flame/smoke rating in tackboards in accordance with ASTM-E 84.

1.06 QUALITY ASSURANCE
A. Provide all items in this section as manufactured by:
Claridge Products and Equipment, Inc.
Harrison, Arkansas 72602-0910
Phone: 870/743-2200; Fax: 870/743-1908

B. Other approved manufacturer's
   1. Greensteel

1.07 FIELD CONDITIONS
A. Field measure prior to preparation of shop drawings and fabrication to ensure proper fit.

1.08 WARRANTY
A. Submit s standard warranty, stating when installed in accordance with manufacturer's instructions and recommendations, Claridge trophy and display cases are guaranteed for one year against effects in materials and workmanship. Guarantee does not cover normal wear and tear, improper handling, any misuse, or any defects caused by vandalism or subsequent abuse. Guarantee covers replacement of defective material but does not include cost of removal or reinstallation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

A. 370 Series Recessed Display Cases as manufactured by:
Claridge Products and Equipment, Inc., Harrison, Arkansas 72602-0910;
Phone: 870-743-2200; Fax: 870-743-1908

2.02 MATERIALS

A. 370 Series Recessed Display Case
   1. Laminate (Oak) back panel
   2. Sizes: See Drawings. 4'-8" and 5'4" widths, 4'0 heights, 20" depth

B. Glass Doors: Glass door are 3/16" tempered, sliding glass doors.
   1. Sliding door cases have ground-in finger pulls, doors slide on glides, and are fitted with flat key tumbler locks.
   2. Three 12 inch wide adjustable glass shelves.
   3. Necessary brackets and shelf standards provided.

C. Metal Trim and Accessories: Provide aluminum extrusions as manufactured by aluminum and shall meet or exceed ASTM B221 Alloy Standards. Finish to be etched and anodized satin finish.

D. Colors: As selected from manufacturer's standard colors.

E. Included fluorescent lights.

2.03 FABRICATION

A. Shop assembly: Provide factory assembled cases to requirements indicated on shop drawings.

B. Units shall be of dimensions shown in details and in accordance with manufacturer's shop drawings, as approved by engineer.

PART 3- EXECUTION

3.01 PROJECT CONDITIONS:

A. Verify before installation that interior moisture and temperature approximate normal occupied conditions.

B. Verify that floor and wall surfaces are prepared and ready to receive cases.

3.02 INSTALLATION:

A. Deliver cases. KD to be reassembled on job.

B. Follow manufacturer's instructions for storage and handling of units before installation.

C. Install level and plumb, in accordance with manufacturer's recommendations.

3.03 ADJUST AND CLEAN:

A. Verify that all accessories are installed as required for each unit.

B. At completion of work, clean glass surfaces, back panels and trim in accordance with manufacturer's recommendations, leaving all materials ready for use.

END OF SECTION

2012 ARCHITECHURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 13700
SECURITY CAMERA SYSTEMS

13121 PART 1 - GENERAL

13121.1 Summary

A. Scope of work includes the furnishing and installation of a complete, turn key operation security camera system at both Lincoln Elementary and the High School/Middle School.

B. Pertinent Design Drawings:

1. 100-E3.1
2. 200-E3.1
3. 200-E3.2
4. 200-C1.3

C. Related Specification Sections

1. 13710 - Video Management System
2. 13720 - Digital Video Recorders
3. 13730 – PTZ Cameras
4. 13740 – Dome Interior Cameras
5. 13750 – Dome Exterior Cameras
6. 13760 – Fixed Stick Cameras

D. A minimum of 8 hours training of the Owner's staff shall be included.

E. A minimum of (12) Pc's shall be loaded with any required software.

F. Include a minimum 1 year warranty on labor and 3 years warranty on equipment.

G. Any annual license fees shall be included on the proposal form.

13122 PART 2 - PRODUCTS

13122.1 Products

A. The specifications are based on Bosch products. Acceptable alternate manufacturers include the following:

1. Honeywell
2. Panasonic
3. Pelco

13123 PART 3 EXECUTION

13123.1

A. Integrator shall provide all cabling from cameras to technology closets & provide IT Support on Owner's Network.

END OF SECTION

SECTION 13710
VIDEO MANAGEMENT SYSTEM

PART 2 – PRODUCTS

2.01 Manufacturer

A. Bosch Sicherheitssysteme GmbH
Sicherheitstechnik
Postfach 1111
D-85626 Grasbrunn
Tel +49 (0)800/ 70 00 444
Fax 49 (0)800 700-0888

B. This product shall be manufactured by a firm whose quality system is in compliance with the I.S. /ISO 9001/EN 29001, QUALITY SYSTEM.

2.02 Video Management System General Description

A. The video management system (VMS) specified is an enterprise-class client/server based IP video security solution that provides seamless management of digital video, audio and data across an IP network. The video management system is designed to work with Bosch CCTV products as part of a total video security management system to provide full virtual matrix switching and control capability. The video management system consists of the following software modules: central server, recording services, configuration client, and Operator Clients. Video from other sites may be viewed from single or numerous workstations simultaneously at any time. Cameras, recorders, and viewing stations may be placed anywhere in the IP network.

B. The VMS shall support the following recording services:
   a. Bosch Video Recording Manager (Bosch VMS VRM)
   b. Local Storage and Direct-to-iSCSI recording
   c. Bosch Recording Station NVRs
   d. Bosch DiBos Version 8
   e. Bosch VIDOS NVRs
   f. Bosch VMS Network Video Recorder (Bosch VMS NVR)

   Bosch VIDOS NVRs and Bosch VMS NVRs do not support H.264 and HD recording.

C. The software components of the video management system can be deployed together on a single PC for small system applications or on separate PCs and servers to meet large systems requirements.

D. The central server and the Bosch Video Recording Manager shall run as services on Windows Server 2008R2 and Windows 7.

E. The Configuration Client software shall run as an application on Windows Server 2003, Server 2008R2 , Windows XP and Windows 7.

F. The Operator Client software shall run as an application on Windows XP and

Windows 7.

2.03 BOSCH Video Management System

A. The video management system (VMS) specified shall be a centrally managed, scalable client/server based architecture that allows full virtual matrix switching and control systems.

B. The VMS shall be designed to use a facility's existing IT infrastructure and require no special cabling.

C. The VMS shall provide a built-in command script editor that allows customized command scripts to be written to control virtually all the system functions. Command scripts may be activated by system operators or automatically in response to alarms or system events. The built-in command script editor shall support C# and VB.NET.

D. The VMS shall support all Bosch Security Systems MPEG-4 and H.264 encoders, decoders, IP cameras, IP AutoDomes, VIDOS NVRs (also supporting MPEG-2), Bosch Recording Station NVRs, Allegiant matrix switches, DiBos, Bosch POS/ATM bridge, and DiBos compatible ATM bridge.

E. The VMS shall have one Operator Client that can playback NVR recordings, VRM recordings, DiBos recordings, VIDOS NVR recordings, and Bosch Recording Station NVR recordings at the same time.

F. The VMS shall have one Operator Client that can export all recording listed in (E) to one single archive

G. The VMS specified shall support the following languages:
English, German, Dutch, Italian, Portuguese, French, Spanish, Simplified Chinese, Traditional Chinese, Russian, Hungarian, Czech, Danish, Finnish, Greek, Norwegian, Polish, Swedish, Thai, Turkish, Japanese, and Korean. The VMS shall allow specifying the language per user group in order to enable multiple languages for different operators in one system. The VMS shall allow specifying the language for configuration client. If "Default System language" is specified, the system shall use the same language as the Operating System language.

H. The VMS shall provide up to 10 different and independent programmable recording schedules. The schedules may be programmed to provide different record frames rates for day, night, and weekend periods as well as special days. Advanced task schedules may also be programmed that could specify allowed logon times for user groups, when events may trigger alarms, and when data backups should occur.

I. The VMS shall allow the establishment of user groups that have access rights to specific cameras, priority for pan/tilt/zoom control, rights for exporting video, and access rights to system event log files. Access to live, playback, audio, PTZ control, preset control, and auxiliary commands shall be programmable on an individual camera basis.

J. The VMS shall support Dual Authorization logon. It shall function as follows:
   a. Dual Authorization user groups may be created.
   b. Logon pairs, consisting of any two normal user groups, may be assigned to each Dual Authorization user group.
   c. A separate set of privileges and priorities can be assigned for each

Dual Authorization user group.

d. For each user group assigned as part of a logon pair, it shall be configurable whether the group can
   - Log on either individually or as part of the logon pair
   - Or log on only as part of the logon pair.
e. If a user that is part of logon pair logs on individually, then he shall receive the privileges and priorities of his assigned user group. If the same user logs in as part of a logon pair, i.e. being authorized by the second user, then the user shall receive the privileges and priorities assigned to the Dual Authorization group to which the pair is assigned.
f. The logbook shall log the log on procedure to identify a single user or a dual authorization log on. Subsequent user actions shall be logged as the actions of the first user.

K. The VMS shall interface with the Intelligent Video Analysis (IVA) techniques of the Bosch IP encoders and IP cameras to provide advanced motion detection that analyzes object size, direction, and speed as well as detecting objects entering or leaving designated areas.

L. The VMS shall support configuring the IVA parameters from the Configuration Client.

M. The VMS shall react to events triggered by the IVA of the encoders or IP cameras.

N. The VMS workstations may be connected to up to 4 monitors where each monitor may be configured to display live streaming video, playback video, site maps, or alarms.

O. The VMS shall support Lightweight Directory Access Protocol (LDAP) that allows integration with enterprise user management systems such as Microsoft Active Directory.

P. The VMS shall export video and audio data optionally in ASF format to a CD/DVD drive, a network drive, or a USB drive. The exported data in ASF format may be played back using standard software such as Windows Media Player.

Q. The VMS shall export video and audio data optionally in its native recording format to a CD/DVD drive, a network drive, or a direct attached drive. The exported data in native recording format shall include all associated metadata. Viewer software shall be included with the export. Once installed, the viewer software allows playback of the streams on any compatible Windows PC.

R. The VMS shall auto-discover encoder, decoder, NVR, and VRM devices. Device detection shall support devices in different subnets.

S. The VMS shall auto-discover Bosch IP devices with their default IP addresses, and allow auto-assignment of unique IP addresses.

T. The VMS shall be able to simultaneously configure multiple encoders or decoders, even of different types. When devices of different types are being configured, only the parameters available in all devices are available for configuration.

U. The VMS shall support continuous operation during Central Server down-times

as live viewing, playback of recording and export of video data. The Operator Client shall indicate its connection status to the Central Server.

V. The VMS shall be designed in such a way that configuration changes to any part of the system shall not interrupt operational tasks, until the operator decides to update re-fresh the workstation configuration.

2.04 Video Management System Components

A. Central Server software shall provide management, monitoring, and control of the entire system. The central server software should typically be installed on a server-class computer, but may be installed, with all the other video management software modules on one workstation. The Central Server shall also maintain data stream management, alarm management, priority management, central logbook, central configuration and user management.

B. Software updates to the Operator Client and Configuration Client shall be automatically deployed from the Central Server.

C. The Bosch VMS NVR software shall provide recording and playback management of video, audio, and data. The Bosch VMS NVR software configures the streaming parameters of the assigned devices. The Bosch VMS NVR software administers the data on the connected hard disk drives.

D. The VMS shall be designed in such a way the Central Server downtimes do not affect the functionality of the recording services (Bosch Video Recording Manager, Bosch Recording Station NVRs, Local Storage, Direct-to-iSCSI-Recording, Bosch VMS NVR). Normal recording and Motion recording shall continue during the Central Server downtimes, only Alarm Recording cannot be activated as the Central Server is responsible for evaluating the alarm conditions. During Central Server downtime the recording services shall still be able to change the recording parameters schedule dependent.

E. Configuration Client software shall provide the user interface for system configuration and management.

F. Operator Client software shall provide the user interface for system monitoring and operation. The Operator Client maintains live monitoring, storage retrieval, and alarm handling.

2.05 Video Recording Manager (VRM)

A. The VMR shall be an optional package of the installation program of the VMS.

B. The video management system shall be capable of managing multiple VRMs.

C. The VRM shall be configured from the VMS Configuration Client. It shall be possible to assign encoders and IP cameras to it.

D. The recording parameters shall be configured in the recording tables of the VMS configuration program. These settings will be replicated into the devices from the Central Server.

E. The VRM shall manage exclusively the Bosch encoders and Bosch IP-Cameras, and the Bosch supported iSCSI storage systems. It shall offer system wide recording monitoring and management of iSCSI storage, video servers and cameras.

F. The VRM shall support the encoders and cameras to directly stream the data to the iSCSI storage. The VRM shall not be involved in the processing of the data.

G. The VRM shall manage all disk arrays in the system as a single virtual common pool of storage. It shall dynamically assign portions of that pool to the encoders and IP-Cameras.

H. The transfer rate of the data from the encoder or IP-Camera is limited by network speed and the iSCSI data throughput rate.

I. The VRM shall provide redundancy for storage provisioning and failover design for central recording management service.

J. The VRM shall be able to restore a lost recording database from data on the iSCSI storages.

K. The VRM shall provide flexible retrieval of recordings. It shall be able to determine on which iSCSI disk array data from each camera or encoder has been stored.

L. It shall be possible to secure the access to the VRM software with a password. This shall be done in the Configuration Client.

M. The VRM software shall provide status monitoring information as a web interface. The following information shall be provided:
   a. Uptime of the VRM software
   b. Bit rate information for the recorded data
   c. Retention times per camera
   d. Status on recording and storage

N. The video management system shall allow configuring if playback of recordings is streamed through the VRM or is streamed directly from the iSCSI storage.

O. The video management system shall support to retrieve the playback information, i.e. from which iSCSI storages to retrieve the video, audio and meta-data, either from the Video Recording Manager or directly from the IP encoder or camera. Playback information directly from the IP encoder or camera is limited in time and should be used while the VRM is not available to increase the reliability of the video management system.

2.06 VIDOS NVR support

A. The VMS shall be able to integrate VIDOS NVRs. It shall be possible to playback data recorded by VIDOS NVRs. This shall include MPEG-2 and MPEG-4 data.

B. The video management system shall be capable of managing multiple VIDOS NVRs.

C. The Operator Client shall display live and recorded data from cameras assigned to VIDOS NVRs. In playback mode the VIDOS NVR cameras shall appear in the graphical timeline, and can be operated identically to IP cameras from the VRM devices.

D. Changing the configuration of a VIDOS NVR shall require the VIDOS NVR configuration software which is not integrated into the VMS.

2.07 Bosch Recording Station NVR support

A. The VMS shall be able to integrate Bosch Recording Station NVRs. It shall be possible to playback data recorded by Bosch Recording Station NVRs. This shall include MPEG-4, H.264, and JPEG data.

B. The video management system shall be capable of managing multiple Bosch Recording Station NVRs.

C. The cameras connected via Bosch Recording Station shall behave the same as VRM managed IP cameras in the video management system Operator Client, with the following exceptions:
   a. The Bosch Recording Station camera icons shall include a graphical indication that the cameras are from Bosch Recording Stations.
   b. Bosch Recording Station cameras are not displayable on decoder outputs.

D. The Operator Client shall display live and recorded data from cameras assigned to Bosch Recording Station NVRs. In playback mode the Bosch Recording Station NVR cameras shall appear in the graphical timeline.

E. Changing the configuration of a Bosch Recording Station NVR shall require the Bosch Recording Station NVR configuration software which is not integrated into the VMS.

2.08 Analog Monitor Support

A. The VMS shall support analog monitors connected to IP decoders.

B. It shall be possible to configure analog monitors in full screen mode or quad mode. When in quad mode, the VMS shall be able to select video and control cameras in any quadrant.

C. It shall be possible to group analog monitors into Analog Monitor Groups (AMGs). An AMG shall specify a monitor arrangement of rows and columns.

D. It shall be possible to restrict access to AMGs to specified Operator Client workstations.

2.09 Alarm Management Capability

A. The video management system shall provide the capability to allow alarms to be schedule-dependent.

B. The video management system shall allow alarms to be individually allocated to specific user groups for processing.

C. The video management system shall support replication of events such that a single physical event causes multiple system events. These multiple events shall be independently configurable to allow independent handling of the alarms by multiple operator groups, or to be handled differently according to different schedules.

D. The video management system shall be programmable to selectively, per alarm and per user group, automatically pop-up the alarm video.

E. The video management system shall support display of alarm video in a special Alarm Image Window so users do not have to search their display screens to find the alarm images.

F. The video management system shall display alarm video in rows of Alarm Image Panes, with one row per alarm, and with up to 5 Image Panes per row.

G. The video management system's Alarm Image Panes shall be configurable to display live video, playback video, text documents, site maps, HTML files, or web sites (URLs). Per alarm one playback video and one site map can be configured.

H. The video management system's Alarm Image Pane rows shall be displayed in order of their priority, with rows for higher priority alarms always displayed above lower priority alarm rows. The display order for equal priority alarms shall be selectable between new alarms displayed above existing alarms, or new alarms displayed below existing alarms.

I. The video management system shall provide an alarm reaction time of maximum 2 seconds when sufficient network bandwidth is available.

J. The video management system shall distribute alarm notifications, via entries in the alarm list of the operator user interface, to all members of the user groups to which the alarm is assigned. The alarms shall appear in all said users' alarm lists.

K. The video management system shall operate as follows: when an alarm is accepted by a user, it shall be removed from the other users' alarm lists.

L. The video management system shall allow a user to un-accept an alarm he has previously accepted. In this case, the alarm shall re-appear in the alarm lists of all members of the user groups assigned to this alarm.

M. The video management system shall support the association of workflows with alarms. Workflows shall consist of action plans and comment boxes. An action plan shall display a text document, HTML page, or web site that typically contains instructions for handling the alarm. Comments entered in the comment boxes shall be logged in the system logbook.

N. The video management system shall be configurable to force an alarm workflow. In this case, the alarm cannot be cleared until the workflow is processed.

O. The video management system shall offer the possibility to automatically clear alarms when the originating event condition is no longer true.

P. The video management system shall allow alarms to be configured to send PTZ cameras to prepositions or to execute camera Aux commands on occurrence.

Q. The video management system shall be configurable to put any IP-connected camera into alarm recording mode on alarm occurrence.

R. The video management system shall be configurable to send an e-mail or SMS message in response to an alarm.

S. The VMS shall be capable of displaying video on analog monitors connected to video decoders in response to alarms.

T. The VMS alarm response shall take advantage of the row and column arrangement of analog monitor groups by associating a row of analog monitors with each active alarm. Each alarm may display video on multiple monitors, limited by the number of columns in the analog monitor group.

U. As new alarms are received, alarm rows shall stack in priority order on the analog monitors.

V. The VMS shall support for alarms to display video on multiple analog monitor groups, with configurable assignment of individual assignment of alarms to monitor groups.

2.10 Matrix Switch Connection

A. The video management system shall interface with the Bosch Allegiant family of video matrix switches. Video Encoders shall be connected to one or more monitor outputs of the matrix switcher to provide the video interface.

B. The video management system shall automatically import the camera names from the matrix switch.

C. Matrix switch cameras shall behave the same as IP cameras in the video management system Operator Client, with the following exceptions:
   a. The matrix switch camera icons shall include a graphical indication that the cameras are from a matrix switch.
   b. Cameras from the matrix switch are not recorded and are therefore not available in playback mode.
   c. The number of cameras from a matrix switch that are simultaneously displayed on client workstations is limited to the number of encoders connected to monitor outputs. If a user tries to exceed this limit, the video management system shall assign the available outputs based on user priority.

D. The video management system shall receive and process events from the matrix switch, including alarm events and video loss events.

E. The video management system shall support switching of cameras on the matrix switch monitors via context menus on the Allegiant cameras in the video management system logical tree.

F. It shall be possible to configure the system to use the Matrix Switch PTZ connections to control PTZ cameras when the video is looped from the Matrix Switch inputs to video encoders. The configuration interface shall allow specification of the logical camera numbers in the Matrix Switch, then the video management system shall route PTZ commands for corresponding cameras to the Matrix Switch.

2.11 Digital Video Recorder (DVR) Connection

A. The video management system shall interface with the Bosch DiBos v8 family of DVRs.

B. The video management system shall be capable of managing multiple DVRs.

C. The video management system's DVR-connected cameras shall behave the same as IP cameras in the video management system Operator Client, with the following exceptions:
   c. The DVR camera icons shall include a graphical indication that the cameras are from DVRs.
   d. DVR cameras are not displayable on decoder outputs.

D. In the playback mode of the VMS Operator Client, DVR-connected cameras shall appear in the graphical timeline, and can be operated identically to

IP cameras.

F. Changing the configuration of a DiBos DVR shall require the DiBos configuration software which is not integrated into the VMS.

2.12 Relays and Digital Inputs

A. The open/close states of inputs and relays from devices connected to the system, including IP cameras and PTZ cameras, video encoders and decoders, matrix switchers, and DVRs shall be indicated on the VMS Operator Client user interface and can be queried via the VMS SDK.

B. Relays from devices connected to the system shall be controllable from command scripts, the VMS SDK, and icons on the Operator Client user interface.

C. Input and relay state changes from devices connected to the system shall be recognizable as events in the VMS.

2.13 Logbook

A. The system shall protocol every event and alarm in an SQL database. The alarm entry shall contain the camera titles that have been recorded due to this alarm.

B. The logbook shall be able to store at least 500,000 entries per hour. If the capacity of the logbook is filled up the oldest entries will be deleted to create space.

C. The user shall be able to search the logbook for events and alarms. The user shall be able to export the search results into a comma separated value list (CSV).

D. The system shall included and install a ready-to-use SQL database. The system shall optionally allow the usage of a separately installed SQL database.

2.14 Digital I/O Interface Connection

A. The VMS shall interface to the Advantech ADAM 6000 family of digital I/O devices.

B. The digital inputs and relay outputs from the ADAM devices shall provide all of the features and functionality described in the Relays and Digital Inputs section of this document.

C. ADAM 6000 family of devices attached to the network shall be automatically discoverable via a network scan.

2.15 SNMP

A. The video management system shall be capable of monitoring third-party equipment SNMP protocol.

2.16 Pre-Programmed Camera sequences

A. The video management system shall support pre-programmed camera sequences. These sequences will allow cameras to be automatically displayed on the computer image panes and/or analog monitors connected to decoders. The sequences shall support simultaneous display on multiple image panes or monitors. The sequences shall also support camera

prepositions for each PTZ camera on each sequence step. The system shall be configurable such that operators can select these sequences from the logical tree or a site map.

B. Pre-programmed camera sequences can be displayed in Operator Client and on Analog Monitor Groups.

2.17 Command Scripts

A. The video management system shall provide a command script interface that allows system operations to be programmatically controlled.

B. The system shall provide a built-in editor for the creation of the command scripts.

C. The system shall be configurable such that operators can execute the created scripts by double-clicking on representative icons in a logical tree or site map.

D. The system shall be configurable such that the created scripts can be executed automatically in response to a system event. The automatic event-driven execution shall optionally be schedule-dependent.

E. The system shall be configurable to execute a user-group dependent command script on user logon.

F. The system shall be configurable to execute an alarm-dependent command script on user acceptance of the alarm.

2.18 Virtual Inputs

A. The video management system shall provide a software interface that allows third-party software to generate events in the video management system. The software shall support any COM programming languages (e.g. Visual Basic and C++), any .Net programming language (e.g. C#) or JavaScript.

B. The VMS shall allow third-party software to include up to 10 data fields and an Alarm ID along with the virtual input event.

C. These fields shall be searchable in the system logbook.

D. The virtual input data shall be optionally displayed in the Operator Client playback mode synchronously with the associated video.

2.19 SDK

A. The video management system shall provide a documented Software Development Kit (SDK) to allow integration to and integration from third-party software.

B. The SDK shall expose all functionality of the command scripts, including, but not limited to:

- Control of operator workstation image window layout
- Assignment of cameras, documents, URLs, and maps to Operator Client workstation image panes
- Assignment of cameras to analog monitors connected to encoders.
- Dome control
- Alarm generation
- Recording mode control

- Exporting recorded data
- Relay control

C. SDK functionality shall require authentication to the system.

D. The SDK shall be accessible from all .Net programming languages.

2.20 OPC Interface

A. The VMS shall provide an OPC Server for integration into third-party software systems, such as building-management systems.

B. The OPC interface shall follow the OPC Alarms and Events standard.

2.21 CCL Interface

A. The VMS shall emulate the Allegiant Command Console Language (CCL). It shall be possible to select the Allegiant model that shall be emulated.

B. CCL commands shall control:
   a. Camera to decoder connections
   b. Sequences on decoders
   c. Virtual Inputs
   d. PTZ commands

C. The video management system shall receive the CCL commands on a freely definable serial port on the central server.

2.22 Configuration Changes

A. Configuration changes made in the VMS Configuration Client shall modify a working copy of the configuration, and shall not affect the active operating configuration.

B. It shall be possible to activate the working copy through a user action in the Configuration Client, at which point the working becomes the new active operating configuration.

C. It shall be possible to set a date and time in the future at which the working copy becomes active.

D. It shall be possible to view a list of all configuration activations that have been applied to the system. It shall be possible to select any of the activated configurations, and have the system "roll back" to an earlier configuration.

E. It shall be possible to activate a configuration and leave it to the operator to refresh the configuration locally instantly or at a later point in time. It shall be possible to enforce a configuration activation for every Operator Client connected to the Central Server.

2.23 Operator Client

A. The video management system shall provide an administrator-configured Logical Tree. The logical tree shall be freely configurable with any tree structure, with nodes consisting of folders or maps, and leaves consisting of devices (cameras, inputs, and relays), sequences, documents, URLs, or command scripts. Each user group shall only see items in the logical tree for which the administrator has granted access.

B. The user shall be able to search the logical tree for item names.

C. The video management system shall provide a user-dependent Favorites Tree. The Favorites tree shall allow maps, folders, and devices and complete views (image pane patterns with camera assignments) to be configured by each user in a user-defined structure. The user's favorites tree shall be available irrespective of the computer with which he logs on to the system.

D. The video management system shall provide an Image Window that displays a collection of Image Panes. The layout shall be optimized for standard and widescreen monitors. With standard monitors the number of image panes per image window shall be variable between 1 (a single full-window video) and 25, arranged in a 5x5 grid. A slider shall be available allowing the grid size to be changed from 1x1, 2x2, 3x3, 4x4, and 5x5. With widescreen monitors the number of image panes per image windows shall be variable between 1 and 30, arranged in grids of 1x1, 3x2, 4x3, 5x4, and 6x5. The VMS shall allow image panes to be enlarged or decreased in size within the grid. E.g., in a 5x5 grid, a single image pane can be enlarged to use 4 of the grid elements, creating a larger image within the grid. Any pattern can be created within the grid structure. An image pane can be resized by clicking and dragging on any corner, dragging the corner to the desired size.

E. The video management shall implement the concept of a selected image pane. The selected image pane shall be highlighted. There shall always be a selected image pane in the Operator Client application. The selected image pane is always used for control commands, e.g. PTZ control, instant playback control, and audio replay.

F. The video management system shall support the audio channels of the Bosch encoders and IP cameras. It shall be possible to assign audio sources to cameras. In the Operator Client it shall be possible to turn on/off the replay of the audio per camera.

G. The video management system shall support two different audio modes, single source audio and multi source audio.
In single source audio mode only the audio source assigned to the camera in the selected image pane is replayed.
In multi source audio mode all audio sources of the cameras displayed in the client application are replayed.

H. The video management system shall support site maps with hot-spot icons for devices (cameras, relays, and inputs), command script initiation, camera sequence initiation, and links to other site maps. The site maps shall be capable of being zoomed. The hot-spot icons shall be configurable to optionally display the device name or link title.

I. The Operator Client shall display live streams from encoders. For Bosch IP-cameras and encoders it shall be possible to configure per workstation and individually per camera which encoding stream (Stream 1 or Stream 2) of these devices shall be displayed.

J. The video management system shall support automatic sequencing. It shall be possible for users to multiple-select cameras (control-click or shift click), and drag the multiple-selection to an image pane or a graphic representing an analog monitor connected to a decoder. All of the cameras

in the selection shall then sequence in the image pane or monitor at a user-selectable rate. It shall also be possible to drag a folder to an image pane or analog monitor. In this case, all of the cameras contained within the folder shall sequence.

K. The video management system shall support PTZ control with a dedicated graphical joystick control, supporting Pan, Tilt, Zoom, Iris, Focus and Aux Command operations. It shall also support PTZ control via clicking the mouse in the image panes. For PTZ cameras, the cursor shall change to indicate the Pan/Tilt direction when hovering over the corresponding image pane. The Pan/Tilt speed shall increase as the cursor moves farther from the center of the image pane. An area in the center of the image pane shall be used for zoom-in/zoom-out control. Once zoom is initiated, the zoom speed shall increase as the cursor is moved farther from the center of the image pane.

L. The video management system shall support digital zoom of any image pane. A dedicated graphical control shall be provided in the user interface for this purpose. In addition, the mouse wheel shall control digital zoom when the mouse cursor is hovering over a selected image pane.

M. The video management system shall provide an Instant Playback function that displays recorded images on one or multiple image panes. Recorded images from a single camera may also be played back on multiple panes. Instant playback supports pause, play forward, play reverse, single step forward, single step reverse, fast-forward, and fast-reverse.

N. The video management system shall support a timeline that provides a graphical overview of video stored on the disk. The timeline shall display a timescale that can be adjusted from at least 15-minutes per division to 1 month per division. For each camera displayed in playback mode, the timeline shall provide a line that depicts the video storage for that camera. The line shall be color-coded to show if video is recorded for the displayed time period, and if so, if it is normal recording, motion recording, or alarm recording. The line shall be cross-hatched if the video is protected from deletion. The line shall also indicate if associated audio is recorded during the displayed time period.
For VRM and Local Storage recordings color coding is limited to protection and audio indication.

O. The video management system shall support simultaneous time-synchronous playback of up to 16 cameras. Playback shall support single-step forward and backwards; play normal speed forward and backwards; play high-speed forward and backwards; and play slow-speed forward and backwards.

P. The video management system shall support search of recorded video for motion in user-specified areas of a camera image. This cell based post-recording motion search will work for cameras recorded by NVRs and Bosch DiBos DVRs.

Q. The video management system shall support search of recorded video with at least the following criteria: object size, object color, direction, and speed as well as detecting objects entering or leaving designated areas. This Intelligent Video Analysis (IVA) based post-recording search will work for cameras recorded by VRM and Local Storage.

R. The video management system shall optionally display the information of

the video analytics such as cells with detected motion, object masks, and trajectories in live and playback.

S. The video management system shall support searching based on any combination of time/date-rage, event type(s), alarm priority, alarm state, and device(s). It shall be possible to save and recall search parameters.

T. The video management system shall graphically display device states on its icons in the logical tree structure and on sitemaps. For cameras, the states shown shall include: loss of the analog video signal, network connection loss, video recording, video signal too noisy, video signal too bright, video signal too dark, video de-adjusted, and video includes associated audio. For relays and contact inputs, the open or close state shall be indicated.

U. The video management system shall support switching of cameras to analog monitors connected to decoders. The cameras shall be selectable via drag and drop from the logical tree or from the sitemaps.

V. The video management system shall support an indication for the Operator Client regarding the connection state to the Central Server. This shall include connected, disconnected, and configuration out-of-sync between Central Server and Operator Client.

W. The video management system shall support a centrally stored user profile to store settings individual for each operator. These settings shall include but are not limited to sequence dwell times, instant playback replay time and image pane ratio settings (16:9 or 4:3) individually per monitor. These settings shall be available independently of the physical workstation to the operator.

2.24 Audio Intercom Functionality

A. The video management system shall support bidirectional audio intercom functionality. Audio intercom streams audio data from an Operator Client Workstation to the audio output of the Bosch encoders.

B. The audio intercom function shall be activated by a button in the Operator Client Workstation. When the button is pressed the operator shall be able to speak into a microphone on the client computer. The audio shall be transmitted to the audio source which is assigned to the currently selected camera.

2.25 CCTV Keyboard Control

A. The system shall allow system control via the Bosch IntuiKey family of keyboards, including the KBD-DIGITAL and KBD-UNIVERSAL.

B. Keyboard connections shall be possible to both Bosch VIP-XD Decoders and to Operator Client Workstations.

C. When CCTV Keyboards are connected to VIP-XD decoders, it shall be possible to control the analog monitor groups in the system via the CCTV keyboard.

D. When CCTV Keyboards are connected to VIP-XD decoders, it shall be possible to control PTZ operation of the selected camera using the keyboard joystick.

E. When CCTV Keyboards are connected to VIP-XD decoders, it shall be possible to control set and call-up PTZ prepositions of the selected camera using the keyboard.

F. When CCTV Keyboards are connected to VIP-XD decoders, it shall be possible to execute PTZ and AutoDome Aux commands on the selected camera using the keyboard.

G. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to control the current Image Pane selection using the keyboard joystick.

H. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to control the analog monitor groups in the system or control any Image Pane on the connected Operator Client Workstation, using the CCTV keyboard.

I. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to control PTZ operation of the selected cameras using the keyboard joystick.

J. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to control set and call-up PTZ prepositions of the selected camera using the keyboard.

K. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to execute PTZ and AutoDome Aux commands of the selected camera using the keyboard.

L. When CCTV Keyboards are connected to Operator Client Workstations, it shall be possible to control playback of video, including both Instant Playback and Playback-mode synchronous playback, using the CCTV keyboard.

M. When CCTV Keyboards are connected to Operator Client Workstations, playback control should include jog-shuttle emulation using the Keyboard Joystick.

N. When in Jog-shuttle emulation mode:

   a. Rotating the Keyboard joystick will control forward and reverse playback, with playback speed proportional to the amount of joystick rotation.

   b. Moving the joystick up shall set the video into slow forward playback mode. Additional upward movements shall incrementally increase forward playback speed

   c. Moving the joystick down shall set the video into slow backward playback mode. Additional downward movements shall incrementally increase backward playback speed.

   d. Moving the joystick right shall set the video into pause mode. Additional rightward movements shall step the video one frame forward.

   e. Moving the joystick left shall set the video into pause mode. Additional leftward movements shall step the video one frame

HUDSON AREA SCHOOLS

SECTION 13720
DIGITAL VIDEO RECORDERS

PART 1 – GENERAL

1.1 REFERENCES

A. Federal Communications Commission (FCC) (www.fcc.gov)
   1. FCC Part 15 Class A

B. International Organization for Standardization (ISO)
   1. 9001 – Quality System

C. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. UL 60950

1.2 DEFINITIONS

A. Disk on Module (DoM): Solid-state, non-volatile memory module that contains a backup image of all system software needed to a full system recovery.

B. RAID: Redundant Array of Independent Disks is a technology that employs the simultaneous use of two or more hard disk drives to achieve greater levels of performance, reliability, and/or larger data volume sizes.

C. iSCSI: Internet SCSI is a protocol that allows clients (called initiators) to send SCSI commands to SCSI storage devices (targets) on remote servers via an IP network.

D. SNMP: Simple Network Management Protocol is a component of the Internet Protocol Suite as defined by the Internet Engineering Task Force (IETF). SNMP is used in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

1.3 SYSTEM DESCRIPTION

A. Section Includes
   1. Digital Video Recorders and Analog Recording Devices

B. Performance Requirements
   1. The IP Video Storage System shall be an embedded, all-in-one IP Video Storage subsystem that provides “plug-and-play” iSCSI-based recording and management.
   2. The IP Video Storage Array shall allow recording on up to 64 channels.
   3. The IP Video Storage Array shall be a pre-configured and pre-installed iSCSI disk array.

4. The IP Video Storage Array shall be a 2 U rack-mount chassis with eight (8) hot swappable, 3 Gbps SATA-II hard disk drives with RAID-5 protection.
5. The IP Video Storage System shall be integrated with the Bosch Video Recording Manager (VRM) application.

1.4 SUBMITTALS

A. Product Data:
   1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

B. Shop Drawings; include
   1. System device locations on architectural floor plans.
   2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
   1. User manual.
   2. Parts list.
   3. System device locations on architectural floor plans.
   4. Wiring and connection diagram.
   5. Maintenance requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer:
   1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.

B. Video Surveillance System:
   1. This product shall be manufactured by a firm whose quality system is in compliance with the I.S. /ISO 9001/EN 29001, QUALITY SYSTEM.

C. Installer:
   1. Minimum of [5] years experience installing Video Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

A. Comply with requirements of Section 01 60 00.

B. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

C. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

D. Handle and operate products and systems according to manufacturer's instructions.

HUDSON AREA SCHOOLS

E. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.7 WARRANTY

A. Provide manufacturer's warranty covering 3 years for replacement and repair of defective equipment.

1.8 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions:
1. Acceptable alternate manufacturers are listed in Section 13700.

2.2 BOSCH DLA-AIOL1-08AT

A. General Characteristics:
1. The IP Video Storage System shall be an embedded, all-in-one IP Video Storage subsystem that provides "plug-and-play" iSCSI-based recording and management.
2. The IP Video Storage Array shall allow recording on up to 64 channels.
3. The IP Video Storage Array shall be a pre-configured and pre-installed iSCSI disk array.
4. The IP Video Storage Array shall be a 2 U rack-mount chassis with eight (8) hot swappable, 3 Gbps SATA-II hard disk drives with RAID-5 protection.
5. The IP Video Storage Array shall be configured with 8 x 1 TB 24 x 7 hard disk drives in RAID-5 configuration and two (2) redundant 1 GbE network interfaces.
6. The IP Video Storage Array shall be integrated with the Bosch Video Recording Manager (VRM) application.

HUDSON AREA SCHOOLS

B. Processor
   1. The IP Video Storage Array shall contain an Intel Pentium G6950 Dual Core 2.8GHz
   2. The IP Video Storage Array processor shall contain one (1) socket.
   3. The IP Video Storage Array processor shall feature a 1 x 3 MB Level 2 cache memory.
   4. The IP Video Storage Array processor shall include ECC Unbuffered memory protection.
   5. The IP Video Storage Array processor shall contain a 1333 MHz maximum front side Bus.

C. Memory
   1. The IP Video Storage Array shall have 4 GB, DDR3-1333 ECC UNB (2 x 2 GB) of memory installed.

D. Storage
   1. The IP Video Storage Array shall meet the following storage specifications:
      a. Gross Capacity: 8 x 1 TB
      b. Net Capacity: 6415 GB
      c. Bandwidth: 200 Mbit/s
      d. iSCSI Sessions: 64+ (64+ concurrent iSCSI sessions indicate the number of concurrent recording sessions plus 8 sessions for replay)
   2. The IP Video Storage Array shall contain eight (8) 3.5 in. SATA storage trays.
   3. The IP Video Storage Array shall have 8 TB, 1.0 TB (7,200 RPM, 32 M 3.5 in.) hard drives installed.
   4. The IP Video Storage Array shall include an AOC-SASLP-H8iR (8-port LSI 1078 SAS controller).

E. Functions
   1. The IP Video Storage System shall contain a Disk-on-Module (DoM) solid-state memory module that contains a non-volatile backup image of all system software which can be used to initiate a full system recovery in the event the system partition is lost or corrupted.
   2. The IP Video Storage System shall be an embedded, all-in-one IP Video Storage subsystem that provides “plug-and-play” iSCSI-based recording and management.
   3. The IP Video Storage Array shall be a Single-Socket-System with a 720 W power supply.
   4. The IP Video Storage Array shall be installed with the Microsoft Windows Storage Server 2008 operating system.

F. Management
   1. The IP Video Storage Array shall provide a user interface that features:
      a. storage server configuration
      b. unified storage appliance management
      c. simplified setup and management of storage
      d. support for Microsoft iSCSI Software Target
   2. The IP Video Storage Array shall be managed with the Microsoft System Center Suite.

G. Monitoring
   1. The IP Video Storage Array shall support the following:
      a. SNMP
      b. Remote Desktop
      c. HTTP monitoring
   2. The IP Video Storage Array shall be installed with the Microsoft Windows Storage Server 2008 operating system.

H. Electrical:
   1. [Input Voltage: 120 VAC
      a. Actual Output Wattage from Power Supply: 256.44 W
      b. Efficiency of Power Supply: 88%
      c. Total System Power Consumption: 291.41 W
      d. Total BTU/h: 994.59
      e. Power Factor: .95
      f. System AC Input VA Requirement: 306.75 VA]
   2. [Input Voltage: 240 VAC
      a. Actual Output Wattage from Power Supply: 256.44 W
      b. Efficiency of Power Supply: 90%
      c. Total System Power Consumption: 284.94 W
      d. Total BTU/h: 972.49
      e. Power Factor: .92
      f. System AC Input VA Requirement: 309.71 VA]

I. Mechanical
   1. Form Factor: 2 U Rack Mount (825TQ-R720)
   2. Power Supply: 720 W Gold Level redundant
   3. USB Ports: 4 USB 2.0; 2 in rear, 2 in front (1 Type-A onboard)
   4. Network: Dual Intel® 82573 Gigabit LAN
   5. Dimensions (H x W x D): 648 x 437 x 89 mm (25.5 x 17.2 x 3.5 in.)
   6. Weight: 23.6 kg (52 lb)

J. Environmental:
   1. Operating Temperature: +10°C to +35°C (+50°F to +95°F)
   2. Non-operating Temperature: –40°C to +70°C (–40°F to +158°F)
   3. Operating Relative Humidity: 8 to 90%, non-condensing
   4. Non-operating Relative Humidity: 5 to 95%, non-condensing

K. Accessories:
   1. [DLA-LDTK-100A: DLA Series 1000 GB HDD]
   2. [DLA-AIOL1-DOM: AIO – DLA Series Disk on Module (DoM) Solid-state System Recovery Disk]

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

B. Perform installation with qualified service personnel.

C. Install devices in accordance with the National Electrical Code or applicable local codes.

D. Ensure selected location is secure and offers protection from accidental damage.

E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMONSTRATION

A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION

SECTION 13730
PTZ CAMERAS

PART 1 – GENERAL

1.1 REFERENCES

A. American National Standards Institute (ANSI) (www.ansi.org).
   1. ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

B. Federal Communications Commission (FCC) (www.fcc.gov)
   1. FCC CFR 47 part 15 class A – Telecommunications – Radio Frequency Devices – Digital Device Emission.

C. Institute of Electrical and Electronics Engineers, Inc. (IEEE) (www.ieee.org)
   1. IEEE 802.3af Power Over Ethernet.

D. International Organization for Standardization (ISO)
   1. 9001 – Quality System.

E. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. UL 50 Enclosures for Electrical Equipment.
   2. UL 2043 Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces.
   3. UL 60950-1 Information Technology Equipment - Safety.

1.2 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices
   1. Dome Day/Night IP PTZ CCD camera

B. Performance Requirements
   1. A day/night high-resolution CCD dome PTZ camera that offers 550 TVL, 12x digital zoom, and wide dynamic range.
   2. Progressive scan technology.
   3. Sodium Vapor White Balance mode.
   4. Quad video streaming generates simultaneous H.264, M-JPEG, and JPEG video streams
   5. ONVIF conformant; provides interoperability with other conformant systems
   6. National Transportation Communications for ITS Protocol (NTCIP) conformant
   7. Embedded Intelligent Video Analytics (IVA) for reliable detection, tracking, analysis, and search capabilities
   8. High-impact, heavy-duty, tamper resistant aluminum housing with the protection of a rugged bubble

9. High-speed 360-degree continuous pan
10. Preset tour and AutoPan modes
11. Provide 24 hour security with detail images – day or night.
12. Possess advanced intelligence features.
13. Features wall, corner, mast, and pole mount options.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

B. Shop Drawings; include
   1. System device locations on architectural floor plans.
   2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
   1. User manual.
   2. Parts list.
   3. System device locations on architectural floor plans.
   4. Wiring and connection diagram.
   5. Maintenance requirements.

1.4 QUALITY ASSURANCE

A. Manufacturer:
   1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
   2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.

B. Video Surveillance System
   1. Listed by UL specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:
   1. Minimum of [5] years experience installing Video Surveillance System.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

C. Handle and operate products and systems according to manufacturer's instructions.

D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.6 WARRANTY

A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.7 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions:
1. Acceptable alternate manufacturers are listed in Section 13700.

2.2 BOSCH VG5 AUTODOME 700 SERIES IP CAMERA VG5-723-ECE2

A. General Characteristics:
1. The day/night IP PTZ camera shall offer a 28x or 36x 1/4-in. Exview HAD CCD camera with 12x digital zoom.
2. The day/night IP PTZ camera shall offer wide dynamic range technology that allows for the capture of clear from both light and dark areas in the same scene.
3. The day/night IP PTZ camera shall offer progressive scan technology that allows for the capture of clear images from a moving camera.
4. The day/night IP PTZ camera shall feature a Sodium Vapor White Balance mode for taking images under a street lamp or tunnel lamp.
5. The day/night IP PTZ camera shall provide direct network connection using H.264 and M-JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
6. The day/night IP PTZ camera shall offer embedded Intelligent Video Analysis (IVA) that eliminates dedicated PCs and associated software maintenance.
7. The day/night IP PTZ camera shall support the following tour modes:
   a. 99 user-defined pre-positions with 20-character titles.
   b. One (1) preset tour capable of 99 pre-positions and a configurable dwell time between positions.
   c. One (1) AutoPan mode.
8. The day/night IP PTZ camera shall provide pan and tilt preset repeatability accurate to within ±0.1 degrees.
9. The day/night IP PTZ camera shall provide the following variable pan/tilt speeds
   a. A range of 0.1 degrees per second to 120 degrees per second.
   b. A pan speed of 360 degrees per second between prepositions
   c. A tilt speed of 100 degrees per second between prepositions.
10. The day/night IP PTZ camera shall provide a pan range of 360 degrees of continuous rotation.
11. The day/night IP PTZ camera shall provide the patented Bosch AutoScaling (proportional zoom) and AutoPivot features.
12. The day/night IP PTZ camera shall provide 16 independent sectors with 20-character titles/sector.
13. The day/night IP PTZ camera shall provide 24 individual privacy masks with the following features:
   a. Shapes shall be defined with four corners.
   b. The mask shall be gray.
14. The day/night IP PTZ camera shall offer an optional fiber optic media converter kit.
15. The day/night IP PTZ camera shall be able to be mounted to a wall, mounted to a surface, mounted to a pipe, or recessed into an indoor ceiling.
16. The day/night IP PTZ camera shall offer IP66 environmental protection for pendant models and IP54 protection for in-ceiling models.

17. The day/night IP PTZ camera shall support the following languages:
    a. Dutch
    b. English
    c. French
    d. German
    e. Italian
    f. Japanese
    g. Polish
    h. Portuguese
    i. Spanish
18. The day/night IP PTZ camera dome bubble shall:
    a. Meet flame, crush, and impact resistant requirements able to exceed UL 746C standard for polymeric material enclosures.
    b. [Be a high-resolution bubble made of acrylic]
    c. [Be an impact-resistant bubble made of 2.6 mm thick polycarbonate able to withstand a 100 foot-pound impact or the equivalent of a 10 lb sledgehammer dropped from a height of 10 feet.]
    d. Offer a clear or tinted version.

B. Basic Features:
1. The day/night IP PTZ camera shall provide a feature that automatically rotates, or pivots, the camera to simplify tracking of a person walking directly under the camera.
2. The day/night IP PTZ camera shall provide advanced troubleshooting and diagnostics via diagnostic LEDs and on-screen diagnostic displays.
3. The day/night IP PTZ camera shall allow an optional integral fiber optic media converter transceiver module, capable of transmitting and receiving video and Biphase signals up to 60 km (37 miles).
4. The day/night IP PTZ camera shall be compatible with the Bosch Video Client and the Bosch Video Recording Manager.

C. IP Connectivity
1. The day/night IP PTZ camera shall allow full camera control and configuration capabilities over the network.
2. The day/night IP PTZ camera shall be capable of capturing and storing images using H.264 compression.
3. The day/night IP PTZ camera shall deliver the following simultaneous streams:
    a. Two (2) individually configurable H.264 streams.
    b. One (1) H.264 I-frame only stream.
    c. One (1) M-JPEG stream.
4. The day/night IP PTZ camera shall deliver DVD-quality video, at rates up to 30 images per second, via TCP/IP over Cat5/Cat6 UTP cable.
5. The day/night IP PTZ camera shall support iSCSI devices to allow the network-enabled camera to stream video directly to an iSCSI RAID array.
6. The day/night IP PTZ camera shall conform to the ONVIF standard.
7. The day/night IP PTZ camera shall conform to the NTCIP 1205 protocol.
8. The day/night IP PTZ camera shall offer embedded Intelligent Video Analysis (IVA) that eliminates dedicated PCs and associated software maintenance.

D. Intelligent Video Analysis
   1. The day/night IP PTZ camera shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
   2. The day/night IP PTZ camera shall be capable of detecting and sending alarms for abnormal events.
   3. The day/night IP PTZ camera shall be configurable to analyze up to 10 different scenes for one or more of the following events: Line Crossing, Loitering, Idle Object, Removed Object, Conditional Change, Trajectory Tracking, and Filters.
   4. The day/night IP PTZ camera shall allow users to set up to 10 separate profiles and switch profiles based on a day/night or holiday schedules.
   5. The day/night IP PTZ camera shall support scene tours that automatically reposition the camera to each scene for a specified duration.
   6. The day/night IP PTZ camera shall incorporate an Alarm Rule Engine, enabling abnormal events that IVA detects to prompt the camera to take one or more actions such as:
      a. Trigger a relay connected to an alarm siren and/or strobe
      b. Trigger a visual alert to be displayed on the operator's screen
      c. Go to a specified scene (preset position)

E. Advanced Features
   1. The day/night IP PTZ camera shall provide fast 360º per second pan speed and 100º per second tilt speed.
   2. The day/night IP PTZ camera shall divide the cameras 360º rotation into 16 independent sectors with 20-character titles per sector. Any or all of the 16 sectors can be blanked from the operator's view.
   3. The day/night IP PTZ camera shall offer the ability to define 24 masks with up to 8 masks per scene that prohibit areas of the field of view from being seen even if the camera is panned, tilted, or zoomed.
   4. The day/night IP PTZ camera shall have a preset tour function.
   5. The day/night IP PTZ camera shall store up to 99 preset scenes with each preset programmable for 20 character titles.
   6. The day/night IP PTZ shall offer one preset tour to display consecutively the preset scenes for a programmed dwell time. Any or all of the presets can be included or excluded from the tour.
   7. The day/night IP PTZ camera shall execute one of the following programmable options when an operator stops manual control of the camera, and a programmed period of time is allowed to expire: return to a stored preset number, return to the automated tour previously executed, and do nothing.

F. Alarm Handling
   1. The day/night PTZ camera shall provide advanced alarm handling to manage up to two (2) alarm inputs and one (1) alarm output by means of a programmable "Rules" engine.
   2. The day/night PTZ camera shall allow any or all of the input contacts to be programmed upon activation to automatically move the camera to any preposition location, close an output relay for a programmed period of time, transmit an alarm signal (via Bilinx) and display an alarm indication on the on-screen display of the monitor.

G. Image Processing
   1. The day/night IP PTZ camera shall provide image stabilization using a dedicated digital signal processor (DSP) to minimize camera shake on both the horizontal and vertical axes while maintaining a clear image as the zoom range increases. The image stabilization algorithms do not reduce camera sensitivity.
   2. The day/night IP PTZ camera shall provide an AutoPivot feature to automatically rotate and flip the camera as it tilts through the vertical position to maintain the correct orientation of the image.
   3. The day/night IP PTZ camera shall provide an AutoScaling feature that reduces the pan/tilt speed as the camera zooms in on an object, so that the relative speed on the screen remains constant.

H. Camera Options
   1. Bosch VG5-7x3 Series
      a. The 28x day/night camera shall consist of an integrated high resolution Exview HAD CCD camera using a 1/4-inch imager.
      b. The 36x day/night camera shall offer the following effective picture elements:
         1) PAL: Approx. 440,000; 752(H) x 582(V)
         2) NTSC: Approx. 380,000; 768 (H) x 494 (V)
      c. The 28x day/night camera shall offer a 28x (3.5 – 98.0 mm, F1.35 to F3.7) auto-iris, auto-focus optical zoom lens. It will have a variable high speed, 360º pan/tilt drive with a top speed of 120° per second.
      d. The 28x day/night camera shall be designed to perform over a wide range of environmental and lighting conditions with a horizontal resolution of 550 TVL (NTSC/PAL).
      e. The 28x day/night camera shall offer sensitivity down to 0.02 lux in day mode, and 0.0026 lux in night mode.
      f. The 28x day/night camera shall switch automatically from daylight color operation to a higher sensitivity nighttime monochrome mode when light levels fall below an adjustable threshold level. Day/night operation may also be manually switched on or off from the system switcher/controller keyboard.
      g. The 28x day/night camera shall possess a full 12x digital zoom that is functional once the maximum 28x optical zoom limit has been reached. The 12x digital zoom lens is on/off selectable from the system controller keyboard.
      h. The 28x day/night camera shall have a Freeze Frame feature that holds a preposition shot while moving to another preposition.
      i. The 28x day/night camera shall offer color correction for images lit with a sodium vapor lamp.

j. The 28x day/night camera shall conform to the following specifications:
   1) Horizontal Resolution: 550 TVL (NTSC/PAL)
   2) Sensitivity:
      a) Day Mode (30 IRE): F1.6, 1/60 (1/50) shutter, max AGC
         SensUp Off: 0.33 lux
         SensUp On (NTSC: 1/4s, 15x; PAL 1/3s, 16.7x): 0.02 lux
      b) Day Mode (50 IRE): F1.6, 1/60 (1/50) shutter, max AGC
         SensUp Off: 0.66 lux
         SensUp On (NTSC: 1/4s, 15x; PAL 1/3s, 16.7x): 0.04 lux
      c) Night Mode (30 IRE): F1.6, 1/60 (1/50) shutter, max AGC
         SensUp Off: 0.066 lux
         SensUp On (NTSC: 1/4s, 15x; PAL 1/3s, 16.7x): 0.0026 lux
      d) Night Mode (50 IRE): F1.6, 1/60 (1/50) shutter, max AGC
         SensUp Off: 0.166 lux
         SensUp On (NTSC: 1/4s, 15x; PAL 1/3s, 16.7x): 0.0082 lux
   3) Electronic Shutter Speed (AES): 1 to 1/10,000 sec.
   4) Lens: 3.5 mm to 98.0 mm, (F1.35 to F3.7)
   5) Optical Zoom: 26x
   6) Digital Zoom: 12x
   7) Video Output: 1.0Vp-p, 75 ohms
   8) Synchronization: Line-lock (-120° to 120° vertical phase adjust) or internal crystal.
   9) Signal to Noise Ratio: Greater than 50 dB
   10) White Balance: 2,000 K to 10,000 K

I. Housing Options
1. The day/night IP PTZ camera shall be offered in Outdoor Pendant and In-Ceiling housings.
2. The day/night IP PTZ camera housings shall come standard with recessed setscrews and a recessed bubble latch for increased tamper resistance.
3. The day/night IP PTZ camera shall provide built-in surge protection for power, data, and video and alarm inputs.
4. [The Outdoor pendant housing shall:
   a. Use a hinge, in-place of a tether, to make installation easier and safer.
   b. Come with an attached sunshield.
   c. Allow camera to view 18º above the horizon.
   d. Conform to IP66 and NEMA 4X standards for a rugged and weather-resistant package.
   e. Be made of cast aluminum for corrosion resistance, and supplied with a built-in heater/blower to provide an operating temperature range down to -40º C to 50º C (-40º F to 122º F).
   f. Use a low-impact, high-resolution acrylic bubble.
   g. Allow removal of the sunshield for conversion to an indoor unit.]
5. [The In-ceiling housing shall:
   a. Allow camera to view 1º above the horizon.
   b. Be Plenum rated and Conform to IP54 standards with the optional VGA-IP54K-IC78 installation kit.
   c. Be made of cast aluminum for corrosion resistance.
   d. Use a high-impact impact-resistant polycarbonate rugged bubble.
   e. The rugged bubble shall be capable of withstanding impacts equivalent to a 4.5 kg (10 lb) eight dropped from a height of 3 m (10 ft).]

J. Mechanical
   1. Pan Range: 360° continuous
   2. Tilt Angle:
      a. Outdoor Pendant: 18° above horizon
      b. In-ceiling: 1° above horizon
   3. Variable Speed: 0.1°/s to 120°/s
   4. Pre-position Speed:
      a. Pan: 360°/s
      b. Tilt: 100°/s
      c. Preset Accuracy: ± 0.1° typ.

K. Electrical:
   1. Rated Voltage:
      a. Camera input voltage/power requirements: 21 – 30 VAC, 50/60 Hz
      b. Heater input voltage/power requirements: 21 – 30 VAC, 50/60 Hz
   2. Power Draw (typical):
      a. [In-ceiling: 19 W / 35 VA]
      b. [Indoor Pendant: 19 W / 35 VA (without heater connected in power supply box.)]
      c. [Outdoor Pendant: 55 W / 60 VA]
   3. Surge Suppression (Protection)
      a. Video: Peak current 10kA (Gas Tube Arrester), peak power 1000 W (10/1000µs)
      b. Power Input (Dome): Peak current 7.3 A, peak power 600 W (10/1000µs)
      c. Power Output (Arm Power Supply): Peak current 21.4 A, peak power 1500 W (10/1000µs)
      d. Alarm Inputs: Peak current 17 A, peak power 300 W (8/20µs)
      e. Alarm Outputs: Peak current 2 A, peak power 300 W (8/20µs)
      f. Relay Outputs: Peak current 7.3 A, peak power 600 W (10/1000µs)

L. Network
   1. Standards: H.264 (ISO/IEC 14496□10), M□JPEG, JPEG
   2. Streaming: Multiple individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth:
   3. GOP Structure: IP, IBP, IBBP
   4. Data Rate: 9.6 kbps to 6 Mbps
   5. Overall IP delay: 240 ms
   6. Resolution (PAL/NTSC)
      a. 4CIF/D1: 704 x 576/480 (25/30 ips)
      b. CIF: 352 x 288/240 (25/30 ips)
   7. Frame Rate: 25/30 ips (PAL/NTSC)
   8. Ethernet: 10-Base T/100 Base-TX, auto-sensing, half/full duplex, RJ45
   9. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP 3, RTSP, 802.1x, iSCSI, DynDNS, UPnP, IP v4/6, QoS, SSH, SSL
   10. NTCIP Protocol:
      a. CCTV Camera Control: NTCIP 1205
      b. Application Layer: SNMP per NTCIP 1101:1996 & NTCIP 2301
      c. Transport/Network Layer: TCP/IP per NTCIP 2202:2001
      d. Sub-network Layer: PMPP per NTCIP 2101:2001 & NTCIP 2102:2003

11. Audio
    a. Standard:
        1) G.711, 8 kHz sampling rate
        2) L16, 16 kHz sampling rate
    b. Signal-to-Noise Ratio: Greater than 50 dB
    c. Steaming: Full Duplex / Half Duplex

M. Miscellaneous
1. Sectors/Titling: 16 independent sectors with a 20-character title/sector
2. Masking: 24 individually configurable privacy masks
3. Pre-positions: 99, each with a 20-character title
4. Preset Tours: One (1), consisting of 99 scenes, consecutively
5. Supported Language: English, Chinese, Dutch, French, German, Italian, Japanese, Polish, Portuguese, and Spanish

N. User Connections:
1. Power
    a. Camera, all models: 21-30 VAC, 50/60 Hz
    b. Heater, outdoor pendant: 21-30 VAC, 50/60 Hz
2. Video and Control: RJ-45 100 Base-TX Ethernet
3. Alarm Input (2): NC/NO
4. Alarm Output: Open collector NPN, 32 VDC @ 150 mA, maximum
5. Audio Input Line Level (one way audio)
    a. Input Voltage: 5.5 Vp-p max
    b. Impedance: 9 Kohm typical

O. Environmental:
1. Design Rating
    a. [In-ceiling: Plenum, IP54 (with optional VGA-IP54K-IC78)]
    b. [Pendant, all models: IP66, NEMA 4X]
2. Operating Temperature:
    a. [In-ceiling: –10°C to 40°C (14°F to 104°F)]
    b. [Indoor Pendant: –40° to 50°C (–40° to 122°F)]
    c. [Outdoor Pendant: –40° to 50°C (–40° to 122°F)]
3. Storage Temperature, all models: –40° to 60°C (–40° to 140°F)]
4. Operating Humidity:
    a. [In-ceiling: 0% to 90% relative, non-condensing]
    b. [Indoor Pendant: 0% to 90% relative, non-condensing]
    c. [Outdoor Pendant: 0% to 100% relative, non-condensing]

P. Construction:
1. Weight
    a. [In-ceiling: 2.66 kg (5.86 lb)]
    b. [Indoor Pendant: 2.88 kg (6.3 lb)]
    c. [Outdoor Pendant: 3.03 kg (6.68 lb)]
2. Construction Material
    a. Housing: Cast aluminum
    b. Bubble:
        1) [In-ceiling: Polycarbonate (rugged)]
        2) [Pendants: Acrylic (high-resolution)]

3. Bubble Size: 153.1 mm (6.03 in.)
4. Standard Color: White (RAL9003)
5. Standard Finish: Powder coated, sand finish

2.3 ACCESSORIES

A. Bubbles
   1. In-ceiling
      a. Bosch VGA-BUBBLE-CCLR Clear rugged polycarbonate
      b. Bosch VGA-BUBBLE-CTIR Tinted rugged polycarbonate
   2. Pendant
      a. Bosch VGA-BUBBLE-PCLR Clear rugged polycarbonate
      b. Bosch VGA-BUBBLE-PTIR Tinted rugged polycarbonate
      c. Bosch VGA-BUBBLE-PCLA Clear high-resolution acrylic
      d. Bosch VGA-BUBBLE-PTIA Tinted high-resolution acrylic

B. Mounts
   1. Bosch VGA-ROOF-MOUNT Roof mount, white
   2. Bosch VG4-A-9543 Pipe mount, white
   3. Bosch VG4-A-PA0 Pendant arm mount 24 VAC, white
   4. Bosch VG4-A-PA1 Pendant arm mount with 120 VAC transformer, white
   5. Bosch VG4-A-PA2 Pendant arm mount with 230 VAC transformer, white
   6. Bosch VGA-PEND-ARM Pendant arm without power supply box, white
   7. Bosch VGA-PEND-WPLATE Pendant arm mounting plate for use with VGA-PEND-ARM, white
   8. Bosch VG4-A-TSKIRT Trim skirt for AutoDome power supply box, white
   9. Optional Mounting Accessories
      a. For Roof Mounts
         1) Bosch LTC 9230/01Flat Roof Adapter for Parapet Mount
      b. For Arm Mounts
         1) Bosch VG4-A-9542 Corner Mounting Plate
         2) Bosch VG4-A-9541 Mast (Pole) Mounting Plate

C. In-ceiling Support Kits
   1. Bosch VJR-A3-SP Bracket for suspended or drop ceilings
   2. Bosch VGA-IP54K-IC78Gasket kit for IP54 certification

D. Power Supplies
   1. Bosch VG4-A-PSU0 Outdoor Power Supply Box, no transformer
   2. Bosch VG4-A-PSU1 / VG4-A-PSU2 Outdoor Power Supply Box (120/230 VAC Transformer)

E. Bosch VG4-SFPSCKT Fiber Optic Ethernet Media Converter Kit

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

B. Perform installation with qualified service personnel.

C. Install devices in accordance with the National Electrical Code or applicable local codes.

D. Ensure selected location is secure and offers protection from accidental damage.

E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION

SECTION 13740
DOME INTERIOR CAMERAS

PART 1 – GENERAL

1.1 REFERENCES

A. Federal Communications Commission (FCC) (www.fcc.gov)
   1. FCC CFR 47 part 15 class B – Telecommunications – Radio Frequency Devices – Digital Device Emission.

B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. UL1950-1 – Standard for Information Technology Equipment Including Electrical Business Equipment
   2. UL60950 – Information technology equipment. Safety. General requirements

C. Water/Dust Protection
   1. IP 66
   2. NEMA 4X

1.2 DEFINITIONS

A. Dinion Imaging Technology: An accurate 10-bit digital signal processing technology from Bosch that automatically activate the NightSense feature to extend sensitivity under low-light conditions by a factor of three in monochrome operation.

B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

C. Tri-streaming: A Bosch encoding technology that generates two separate H.264 video streams and one JPEG stream simultaneously. This advanced streaming capability enables the user to tune live viewing and recording requirements independently to meet specific site and enterprise requirements.

D. Back Light Compensation: Selectively amplifies parts of the image to compensate for large contrast differences when only a portion of the image is brightly lit (e.g. a person in a sunlit doorway).

1.3 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices
   1. NDC-455 FlexiDome Color IP Camera

B. Performance Requirements
   1. 1/3-inch color CCD with progressive scan.
   2. Tri-streaming IP video: Simultaneous Dual H.264 streams and one M-JPEG stream.
   3. ONVIF compliant.

4. High-impact, vandal-resistant enclosure (IP66/NEMA 4X).

1.4 SUBMITTALS

A. Product Data:
   1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

B. Shop Drawings; include
   1. System device locations on architectural floor plans.
   2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
   1. User manual.
   2. Parts list.
   3. System device locations on architectural floor plans.
   4. Wiring and connection diagram.
   5. Maintenance requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer:
   1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
   2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.

B. Video Surveillance System
   1. Listed by [UL] specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:
   1. Minimum of [5] years experience installing Video IP Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

C. Handle and operate products and systems according to manufacturer's instructions.

D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.7 WARRANTY

A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.8 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions:
1. Acceptable alternate manufacturers are listed in Section 13700.

[
2.2 BOSCH NDC-455 FLEXIDOME COLOR IP DOME CAMERAS
NDC-455V09-22P and NDC-455V09-22PS

A. General Characteristics:
1. The IP dome camera shall be a compact, high-impact rated, CCD color camera with progressive scan technology.
2. The IP dome camera shall utilize 1/3-inch color CCD image sensor capable of producing up 540 TVL of resolution.
3. The IP dome camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
4. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.

5. The IP dome camera shall conform to the ONVIF standard.
6. The user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, with VIDOS, or on an analog monitor with a Bosch video decoder.
7. The IP dome camera shall provide MOTION+ video motion detection analysis system that provides basic video content analysis. Provide six distinct preprogrammed operational modes stored in the camera.
8. The IP dome camera shall provide four independent, fully programmable privacy mask areas.
9. The IP dome camera shall provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
10. The IP dome camera shall utilize the NightSense feature to extend sensitivity under low-light conditions by a factor of three in monochrome operation.

B. Installation Requirements
1. Shall contain a full-featured camera and integral varifocal lens.
2. Shall be capable of being mounted to a surface, 4S (USA) electrical box, wall, corner, and suspended ceiling.
3. Shall provide power, video, and control via an Ethernet connection.
4. Shall provide power connections on flying leads.
5. Shall provide a built-in test pattern generator.
6. Shall provide a multi-language on-screen display.

C. IP Connectivity
1. The IP dome camera shall allow full camera control and configuration capabilities over the network.
2. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
3. The IP dome camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
4. The IP dome camera shall deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Shielded Cat5/Cat6 cable. Leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.
5. The IP dome camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.
6. The IP dome camera shall support iSCSI devices to allow video stream to be directly recorded to an iSCSI RAID array.
7. The IP dome camera shall conform to the ONVIF standard.
8. [The IP dome camera shall offer Embedded Intelligent Video Analytics (IVA) eliminates dedicated PCs and associated software maintenance.]

D. [Embedded Video Content Analysis
1. The IP dome camera shall be VCA ready; it shall need only a single software license to enable the VCA features in the camera.

2. The VCA software license shall not requires multiple licenses to enable multiple VCA features in the IP dome camera; it shall enable all VCA features with a single license.
3. The VCA software license shall allow users to choose between processing intensive applications, such as Flow control and face detection features or less processing intensive applications, such as idle object.
4. The VCA software license shall enable the following VCA applications;
   a. Idle object
   b. Remove object
   c. Multiple line crossing
   d. Object in field
   e. Loitering
   f. Condition change
   g. Following route
   h. Tampering
   i. Object in field
   j. Entering field
   k. Leaving field]

E. Alarm Handling Features:
   1. Provide an alarm input that may be triggered by either a normally opened or normally closed contact.
   2. Provide the capability on alarm to display up to a 17 character, programmable alarm message.
   3. Provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

F. Electrical:
   1. Rated Voltage:
      a. [NDC-455Vxx-1xP:
         1) 12 VDC ± 10%, 50 Hz
         2) 24 VAC ± 10%, 50 Hz
         3) PoE]
      b. [NDC-455Vxx-2xP:
         1) 12 VDC ± 10%, 60 Hz
         2) 24 VAC ± 10%, 60 Hz
         3) PoE]
   2. Current Consumption:
      a. 12 VDC: 500 mA
      b. 12 VDC with IVA: 650 mA
      c. 24 VAC: 500 mA
      d. 24 VAC with IVA: 650 mA
      e. PoE: 200 mA

G. Sensor
   1. Type: 1/3-inch CCD
   2. Active Pixels:
      a. [PAL: 752 x 582]

b. [NTSC: 768 x 494]

H. IP Video
1. Standards: H.264 (ISO/IEC 14496□10), M□JPEG, JPEG
2. H.264 Profile: Main Profile and Baseline Profile
3. Streaming: Multiple, individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth
4. GOP Structure: I, IP
5. Data Rate: 9.6 kbps to 6 Mbps
6. Frame rate:
   a. H.264: 1 to 50/60 (PAL/NTSC)
   b. M-JPEG: 1 to 25/30 (PAL/NTSC)
7. Resolution:
   a. 4CIF: 704 x 576/480 (25/30 ips)
   b. CIF: 352 x 288/240 (25/30 ips)

I. Video Out
1. Signal: Analog composite (NTSC or PAL) for service
2. Connector: 2.5 mm jack, 75 Ohm
3. Horizontal resolution: 540 TVL
4. Video S/N: 50 dB

J.Sensitivity (3200 K ,89% Scene Reflectivity)
1. Full Video (100 IRE)
   a. Color: 2.6 lx (0.26 fc)
   b. NightSense: 1.04 lx (0.104 fc)
2. Usable Picture (50 IRE):
   a. Color: 0.65 lx (0.065 fc)
   b. NightSense: 0.26 lx (0.026 fc)
3. Usable Picture (30 IRE):
   a. Color: 0.30 lx (0.03 fc)
   b. NightSense: 0.012 lx (0.0012 fc)

K. Video
1. Dynamic Range: 60 dB
2. Image processing : 10-bit processing
3. BLC: Center window weighting
4. Signal-to-Noise Ratio: 50 dB
5. White Balance:
   a. ATW
   b. ATW hold and manual (2500 to 10000K)
6. Auto Black: Automatic continuous, Off
7. NightSense: Adjustable from Off to up to 10x
8. Synchronization:
   a. Internal
   b. Line Lock
9. Shutter:
   a. Auto (1/50 [1/60] to 1/10000) selectable
   b. Auto (1/50 [1/60] to 1/50000) automatic flickerless, fixed selectable
10. Sensitivity Up: Adjustable from Off to 10x

11. Test Pattern Generator:
    a. Color bars 100%
    b. Grayscale 11-step
    c. Sawtooth 2H
    d. Checker board
    e. Cross hatch
    f. UV plane
12. Video Motion Analysis: Motion+ or IVA
13. Privacy Masking: 4 independent areas, fully programmable
14. Controls: OSD with softkey operation

L. Audio
1. Standard G.711: 300 Hz to 3.4 kHz at 8 kHz sampling rate
2. Signal-to-Noise Ratio: > 50 dB

M. Input/Output Ports
1. Audio: 1 x mono line in, 1 x mono line out
    a. Signal Line In: 9 kohm typical, 5.5 Vpp max.
    b. Signal Line Out:
        1) 3.0 Vpp at 10 ohm typical
        2) 2.3 Vpp at 32 ohm typical
        3) 1.7 Vpp at 16 ohm typical
2. Alarm: 2 inputs
    a. Activation Voltage : + 5 VDC to + 40 VDC
3. Relay: 1 output
    a. Signal: 30 VAC or + 40 VDC Max 0.5 A continuous , 10VA

N. Software Control
1. Unit Configuration: Via Web browser or Configuration Manager
2. Motion Detection: On/Off
3. Flicker Control: 50/60 Hz, selectable
4. Software Update: Flash ROM, remote programmable

O. Network
1. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
2. Encryption: TLS 1.0, SSL, AES (optional)
3. Ethernet: 10/100 Base-T, auto-sensing, half/full duplex, RJ45
4. Power over Ethernet: IEEE 802.3af compliant

P. Optical
1. Varifocal Lens: IR-corrected, manual zoom and focus adjustment
2. Iris Control: Automatic Iris control
3. Viewing Angle (H x V):
    a. 2.8 to 10 mm:
        1) Wide 100.8° x 73.7°
        2) Tele: 28.5° x 21.4°
    b. 9 to 22 mm
        1) Wide 31.2° x 22.8°
        2) Tele: 12.8° x 9.6°

Q. Mechanical:
   1. Weight: 800 g (1.76 lb)
   2. Mounting: Flush mount or surface mount
   3. Color:
      a. Trim ring: White (RAL91010)
      b. Inner Liner: Black
   4. Adjustment range:
      a. Pan: 360°
      b. Tilt: 90°
      c. Azimuth: ±90°
   5. Construction:
      a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
      b. Trim ring: Aluminum

R. Environmental:
   1. Operating Temperature Range, with heater off: -20° to 50°C (-4° to 122°F)
   2. Operating Temperature Range, with heater on: -50° to 50°C (-58° to 122°F)
   3. Storage Temperature Range: -50° to 70°C (-58° to 158°F)
   4. Operating Humidity: 5% to 93% relative humidity
   5. Storage Humidity: Up to 98% relative humidity
   6. Impact Protection:
      a. IEC 60068-2-75 test Eh, 50 J
      b. EN 50102, exceeding lK 10
   7. Water/Dust Protection;
      a. IP 66
      b. NEMA 4X
   8. Vibration;
      a. IEC60068-2-6

2.3 ACCESSORIES

A. Mounts/Components
   1. VDA-455SMB Surface Mount
   2. VDA-455TBL Tinted Bubble
   3. VDA-455CBL Clear Bubble
   4. S1460 Service/Monitor Cable

B. Power Supplies
   1. UPA-2410-60 Power Supply
   2. UPA-2430-60 Power Supply
   3. UPA-2450-60 Power Supply
   4. UPA-2420-50 Power Supply
   5. UPA-2450-50 Power Supply

C. Software Options
   1. MVC-FIVA4-CAM IVA License
   2. MVC-FENC-AES BVIP AES 128 bit Encryption License

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

B. Ensure selected location is secure and offers protection from accidental damage.

C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

A. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION

SECTION 13750
DOME EXTERIOR CAMERAS

PART 1 – GENERAL

1.1 REFERENCES

A. Federal Communications Commission (FCC) (www.fcc.gov)
   1. FCC CFR 47 part 15 class B – Telecommunications – Radio Frequency Devices – Digital Device Emission.

B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. UL1950-1 Standard for Information Technology Equipment Including Electrical Business Equipment
   2. UL60950 – Information technology equipment. Safety. General requirements

C. Water/Dust Protection
   1. IP 66
   2. NEMA 4X

1.2 DEFINITIONS

A. Day/Night (infrared sensitive): A camera that has normal color operation in situations where there is sufficient illumination (day conditions), but where the sensitivity can be increased when there is little light available (night conditions). This is achieved by removing the infrared cut filter required for good color rendition. The sensitivity can be further enhanced by integrating a number of fields to improve the signal-to-noise ratio of the camera (this may introduce motion blur).

B. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

C. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

D. Smart BLC (Back Light Compensation): Smart back-light compensation allows the camera to automatically compensate for bright areas of a high contrast scene without having to define a window or area.

1.3 SYSTEM DESCRIPTION

A. Video Surveillance Remote Devices
   1. NDN-498 Series FlexiDome2X Day/Night IP Dome Camera

B. Performance Requirements
   1. 1/3-inch day/night CCD with progressive scan.

2. 20-bit image processing technology.
3. Wide Dynamic Range, 2X-dynamic engine and SmartBLC
4. Tri-streaming IP video: Simultaneous Dual H.264 streams and one M-JPEG stream
5. ONVIF compliant.
6. High-impact, vandal-resistant enclosure.

1.4 SUBMITTALS

A. Product Data:
   1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

B. Shop Drawings; include
   1. System device locations on architectural floor plans.
   2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
   1. User manual.
   2. Parts list.
   3. System device locations on architectural floor plans.
   4. Wiring and connection diagram.
   5. Maintenance requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer:
   1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.
   2. Manufacturer's quality system: Registered to ISO 9001 Quality Standard.

B. Video Surveillance System
   1. Listed by [UL] [EN] [FCC] specifically for the required loads. Provide evidence of compliance upon request.

C. Installer:
   1. Minimum of [5] years experience installing Video IP Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

C. Handle and operate products and systems according to manufacturer's instructions.

D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.7 WARRANTY

A. Provide manufacturer's warranty covering [3] years for replacement and repair of defective equipment.

1.8 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions:
1. Acceptable alternate manufacturers are listed in Section 13700.

2.2 BOSCH NDN-498 FLEXIDOME 2X DAY/NIGHT IP DOME CAMERAS
NDN-498V09-22PS

A. General Characteristics:
1. The IP dome camera shall be a high-impact, vandal-resistant, CCD camera with 20-bit digital signal processing (DSP).
2. The IP dome camera shall utilize 1/3-inch day/night CCD image sensor capable of producing up 540 TVL of resolution.
3. The IP dome camera shall provide direct network connection using H.264 and JPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
4. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
5. The IP dome camera shall conform to the ONVIF standard.
6. The user shall be able to view video on a PC using a Web browser, with the Bosch Video Management System, with VIDOS, or on an analog monitor with a Bosch video decoder.

7. The IP dome camera shall provide MOTION+ video motion detection analysis system that provides basic video content analysis.
8. The IP dome camera shall provide protection against water and dust up to IP 66 (NEMA 4X) standards.
9. The IP dome camera shall provide a cast-aluminum housing, polycarbonate dome and hardened inner liner able to withstand the equivalent of 55 kg (120 lbs) of force.
10. The IP dome camera shall provide six distinct preprogrammed operational modes stored in the camera.
11. The IP dome camera shall provide four independent, fully programmable privacy mask areas.
12. The IP dome camera shall provide an on-screen display to simplify the camera/lens back focus and network configuration settings.
13. The IP dome camera shall provide a lens wizard during lens back focus setup to allow focusing at maximum lens opening to ensure that the object of interest within the field of view always remains in focus.
14. The IP dome camera shall provide a feature (SensUP) that enhances camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s – PAL; 1/60 s to 1/6 s - NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.
15. The IP dome camera shall provide a frame integration mode (Bosch SensUp feature) that can produce a color image with a minimum scene illumination of 0.248 lux (0.023 fc) and a monochrome image, when in the night mode, with a minimum illumination of 0.1 lux (0.0093 fc).
16. The IP dome camera shall provide enhanced night viewing through the increase of IR sensitivity by automatically switching a motorized IR filter from color to monochrome operation in low-light or IR illuminated applications. Allow the IR filter to be switched manually via the alarm input, preprogrammed in a camera mode or profile.
17. The IP dome camera shall utilize 2X-Dynamic technology to extend the dynamic range of the camera to provide a sharper, more detailed image for increased accuracy in color reproduction in harsh lighting conditions.
18. The IP dome camera shall utilize pixel-by-pixel analysis to automatically compensate for bright areas of a high contrast scene (Back light) without having to define a window or area.
19. Backlight compensation shall work in conjunction with dynamic range.
20. The IP dome camera shall utilize AutoBlack technology to adjust the black level of the image so as to maximize the contrast.

B. Installation Requirements
   1. Shall contain a full-featured camera and integral varifocal lens.
   2. Shall be capable of being mounted to a surface, wall, corner, and suspended ceiling.
   3. Shall be capable of being mounted to a 4S (USA) electrical box using the VDA-455SMB Surface Mount Box.
   4. Shall provide power, video, and control via an Ethernet connection.
   5. Shall provide power connections on flying leads.
   6. Shall provide a built-in test pattern generator.
   7. Shall provide a multi-language on-screen display.

C. IP Connectivity
   1. The IP dome camera shall allow full camera control and configuration capabilities over the network.
   2. The IP dome camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
   3. The IP dome camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
   4. The IP dome camera shall deliver DVD-quality 4CIF video, at rates up to 30 images per second, via TCP/IP over Cat5/Cat6 UTP cable. Leverages bandwidth throttling and multicasting capabilities to manage bandwidth and storage requirements efficiently while delivering the best possible image quality and resolution.
   5. The IP dome camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.
   6. The IP dome camera shall support iSCSI devices to allow a network-enabled AutoDome to stream video directly to an iSCSI RAID array.
   7. The IP dome camera shall conform to the ONVIF standard.
   8. [The IP dome camera shall offer Embedded Intelligent Video Analytics (IVA) eliminates dedicated PCs and associated software maintenance.]

D. [Embedded Video Content Analysis
   1. The IP dome camera shall be VCA ready; it shall need only a single software license to enable all VCA features in the camera.
   2. The VCA software license shall not requires multiple licenses to enable multiple VCA features in the IP dome camera; it shall enable all VCA features with a single license.
   3. The VCA software license shall allows user to choose between processing intensive applications, such as Flow control and face detection features or less processing intensive application, such as idle object.
   4. The VCA software license shall enable the following VCA applications;
      a. Idle object
      b. Remove object
      c. Multiple line crossing
      d. Object in field
      e. Loitering
      f. Condition change
      g. Following route
      h. Tampering
      i. Object in field
      j. Entering field
      k. Leaving field]

E. Alarm Handling Features:
   1. The IP dome camera shall provide an alarm input that may be triggered by either a normally opened or normally closed contact.
   2. The IP dome camera shall provide the capability on alarm to display up to a 31 character, programmable alarm message.
   3. The IP dome camera shall provide a relay output that may be selected for normally opened or normally closed operation. The relay can be activated from an external alarm input to the camera, manual activation from the browser, upon video motion detection, or video loss.

F. Electrical:
   1. Rated Voltage:
      a. [NDN-498Vxx-1xP:
         1) 12 VDC ± 10%, 50 Hz
         2) 24 VAC ± 10%, 50 Hz
         3) PoE]
      b. [NDN-498Vxx-2xP
         1) 12 VDC ± 10%, 60 Hz
         2) 24 VAC ± 10%, 60 Hz
         3) PoE]
   2. Current Consumption:
      a. 12 VDC: 500 mA
      b. 12 VDC with IVA: 650 mA
      c. 24 VAC: 500 mA
      d. 24 VAC with IVA: 650 mA
      e. PoE: 200 mA

G. Sensor
   1. Type: 1/3-inch CCD, WDR, dual shutter
   2. Active Pixels:
      a. [PAL: 752 x 582]
      b. [NTSC: 768 x 494]

H. IP Video
   1. Standards: H.264 (ISO/IEC 14496□10), M□JPEG, JPEG
   2. H.264 Profile: Main Profile and Baseline Profile
   3. Streaming: Multiple, individually configurable streams in H.264 and JPEG, configurable frame rate and bandwidth
   4. GOP Structure: I, IP, IPBB
   5. Data Rate: 9.6 kbps to 6 Mbps
   6. Frame rate:
      a. H.264: 1 to 50/60 (PAL/NTSC)
      b. M-JPEG: 1 to 25/30 (PAL/NTSC)
   7. Resolution:
      a. 4CIF: 704 x 576/480 (25/30 ips)
      b. CIF: 352 x 288/240 (25/30 ips)

I. Video Out
   1. Signal: Analog composite (NTSC or PAL) for service
   2. Connector: 2.5 mm jack, 75 Ohm

3. Horizontal resolution: 540 TVL
4. Video S/N: 50 dB

J. Sensitivity
1. NDN-498V03 (F1.2)
   a. Full Video (100 IRE)
      1) Color: 2.48 lx (0.23 fc)
      2) Color + SensUP 10 x: 0.248 lx (0.023 fc)
      3) Monochrome: 1.01 lx (0.093 fc)
      4) Monochrome + SensUP 10x: 0.1 lx (0.0093 fc)
   b. Usable Picture (50 IRE):
      1) Color: 0.621 lx (0.058 fc)
      2) Color + SensUP 10 x: 0.062 lx (0.0058 fc)
      3) Monochrome: 0.23 lx (0.021 fc)
      4) Monochrome + SensUP 10x: 0.023 lx (0.0021 fc)
   c. Usable Picture (30 IRE):
      1) Color: 0.28 lx (0.027 fc)
      2) Color + SensUP 10 x: 0.028 lx (0.0027 fc)
      3) Monochrome: 0.099 lx (0.0092 fc)
      4) Monochrome + SensUP 10x: 0.0099 lx (0.00092 fc)
2. NDN-498V09 (F1.4)
   a. Full Video (100 IRE)
      1) Color: 2.7 lx (0.26 fc)
      2) Color + SensUP 10 x: 0.27 lx (0.026 fc)
      3) Monochrome: 1.1 lx (0.090 fc)
      4) Monochrome + SensUP 10x: 0.11 lx (0.01 fc)
   b. Usable Picture (50 IRE):
      1) Color: 0.69 lx (0.064 fc)
      2) Color + SensUP 10 x: 0.069 lx (0.0064 fc)
      3) Monochrome: 0.27 lx (0.026 fc)
      4) Monochrome + SensUP 10x: 0.027 lx (0.0026 fc)
   c. Usable Picture (30 IRE):
      1) Color: 0.321 lx (0.03 fc)
      2) Color + SensUP 10 x: 0.032 lx (0.003 fc)
      3) Monochrome: 0.11 lx (0.01 fc)
      4) Monochrome + SensUP 10x: 0.011 lx (0.001 fc)

K. Video
1. Horizontal Resolution: 540 TVL
2. Signal-to-Noise Ratio: >50 dB
3. Video Output: Composite video 1 Vpp, 75 Ohm
4. Synchronization:
   a. Internal
   b. Line Lock
   c. HV-lock
   d. Genlock (Burst Lock)
5. Shutter:
   a. Auto (1/50 [1/60] to 1/10000) selectable
   b. Auto (1/50 [1/60] to 1/150000) automatic flickerless, fixed selectable
6. Sensitivity Up: Adjustable from Off to 10x

7. Day/Night: Color, Mono, Auto
8. Auto Black: Automatic continuous, Off
9. Dynamic Engine:
    a. 2X-dynamic
    b. XF-dynamic
    c. SmartBLC+2X dynamic
10. Dynamic Range: 120 dB (20-bit image processing)
11. Image processing : 20-bit processing
12. Dynamic Noise Reduction: Auto, On/Off selectable
13. Sharpness: Level selectable
14. SmartBLC: On (includes 2X-dynamic) / Off
15. AGC: On or Off (0 – 30 dB) selectable
16. Peak White Invert: On/Off
17. White Balance:
    a. ATW
    b. ATW hold and manual (2500 to 10000K)
18. Cable Compensation: Up to 1000 m (3000 ft) coax without external amplifiers
19. Camera ID: 17-character editable string, position selectable
20. Test Pattern Generator:
    a. Color bars 100%
    b. Grayscale 11-step
    c. Sawtooth 2H
    d. Checker board
    e. Cross hatch
    f. UV plane
21. Modes: 6 preset programmable modes
22. Privacy Masking: 4 independent areas, fully programmable
23. Controls: OSD with softkey operation

L. Alarms
1. Alarm Output: Relay
2. Alarm Input (TTL): Profile switching, +3.3 V nominal, +40 VDC max.
3. Alarm Output Relay: 30 VAC or +40 VDC, max. 0.5 A continuous, 10 VA
4. External Synchronization Input: 75 Ohm or high impedance selectable

M. Audio
   1. Standard G.711: 300 Hz to 3.4 kHz at 8 kHz sampling rate
   2. Signal-to-Noise Ratio: > 50 dB

N. Input/Output
   1. Audio: 1 x mono line in, 1 x mono line out
      a. Signal Line In: 9 kohm typical, 5.5 Vpp max.
      b. Signal Line Out:
         1) 3.0 Vpp at 10 ohm typical
         2) 2.3 Vpp at 32 ohm typical
         3) 1.7 Vpp at 16 ohm typical
   2. Alarm
      a. Activation Resistance: 10 ohm max.
   3. Relay: 1 output
      a. Signal: 30 Vpp (SELV), 0.2 A
   4. Data: RS-232/422/485

O. Software Control
   1. Unit Configuration: Via Web browser or Configuration Manager
   2. Motion Detection: On/Off
   3. Flicker Control: 50/60 Hz, selectable
   4. Software Update: Flash ROM, remote programmable

P. Network
   1. Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, HTTPS, FTP, DHCP, IGMP V2/V3, ICMP, ARP, SMTP, SNTP, SNMP, 802.1x
   2. Encryption: TLS 1.0, SSL, AES (optional)
   3. Ethernet: 10/100 Base-T, auto-sensing, half/full duplex, RJ45
   4. Power over Ethernet: IEEE 802.3af compliant

Q. Optical
   1. Varifocal Lens: IR-corrected, manual zoom, and focus adjustment
   2. Iris Control: Automatic Iris control
   3. Viewing Angle (H x V):
      a. 2.8 to 10 mm:
         1) Wide 100.8° x 73.7°
         2) Tele: 28.5° x 21.4°
      b. 9 to 22 mm
         1) Wide 31.2° x 22.8°
         2) Tele: 12.8° x 9.6°

R. Mechanical:
   1. Weight: 740 g (1.63 lb)
   2. Mounting: Flush mount or surface mount
   3. Color:
      a. Trim ring: White (RAL91010)
      b. Inner Liner: Black
   4. Adjustment range:
      a. Pan: 360°
      b. Tilt: 90°
      c. Azimuth: ±90°
   5. Construction:
      a. Dome bubble: Polycarbonate, clear with UV blocking anti-scratch coating
      b. Trim ring: Aluminum

S. Environmental:
   1. Operating Temperature Range, with heater off: -30° to 50°C (-22° to 122°F)
   2. Operating Temperature Range, with heater on: -50° to 50°C (-58° to 122°F)
   3. Storage Temperature Range: -55° to 70°C (-67° to 158°F)
   4. Operating Humidity: 5% to 93% relative humidity
   5. Storage Humidity: Up to 98% relative humidity
   6. Impact Protection:
      a. IEC 60068-2-75 test Eh, 50 J
      b. EN 50102, exceeding lK 10
   7. Water/Dust Protection;
      a. IP 66
      b. NEMA 4X
   8. Vibration:
      a. IEC60068-2-6

2.3 ACCESSORIES

A. Mounts/Components
   1. VDA-455SMB Surface Mount
   2. VDA-455TBL Tinted Bubble
   3. VDA-455CBL Clear Bubble
   4. S1460 Service/Monitor Cable

B. Power Supplies
   1. UPA-2410-60 Power Supply
   2. UPA-2430-60 Power Supply
   3. UPA-2450-60 Power Supply
   4. UPA-2420-50 Power Supply
   5. UPA-2450-50 Power Supply

C. Software Options
   1. MVC-FIVA4-CAM IVA License
   2. MVC-FENC-AES BVIP AES 128 bit Encryption License

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer's instruction at locations indicated on the floor drawings plans.

B. Ensure selected location is secure and offers protection from accidental damage.

C. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

A. Demonstrate at final inspection that video management system and devices function properly.

END OF SECTION

SECTION 13760
FIXED STICK CAMERAS

PART 1 – GENERAL

1.1 REFERENCES

A. Federal Communications Commission (FCC) (www.fcc.gov)
   1. LTC 0435, LTC 0455, LTC 0485, LTC 0610, LTC 0498, LTC 0630, NBC-455, NBN-498:
      Complies with FCC Part 15 Class B.

B. Underwriters Laboratories, Inc. (UL) (www.ul.com)
   1. LTC 0498, LTC 0630:
      Complies with UL1950-1
   2. LTC 0630, NBC-455, NBN-498:
      Complies with UL60950
   3. LTC 0435, LTC 0455, LTC 0485, LTC 0610:
      Complies with UL6500 standards.

1.2 DEFINITIONS

A. Privacy Masking: The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

B. SensUp (sensitivity up): Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 to 1/5 s). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

C. Automatic Gain Control (AGC): a process by which gain is automatically adjusted as a function of input or other specified parameter.

D. Sensitivity: refers to the minimum level of light the CCD chip needs to generate an acceptable video picture, and is measured in lux.

1.3 SYSTEM DESCRIPTION

A. Section Includes
   1. Video Surveillance Remote Devices

B. Performance Requirements
   1. The Prepackaged Camera shall consist of a Bosch Dinion camera, a varifocal lens, a coax cable or Ethernet cable, and a power cable pre-wired into the housing.
   2. The Prepackaged Camera housing shall include a feed-through wall-mount.
   3. The Prepackaged Camera outdoor housings shall be rated to IP66 standards.
   4. The Prepackaged Camera shall feature Bilinx bi-directional communication for remote programming.
   5. The IP-enabled Prepackaged Cameras shall provide MPEG-4 video at up to 30 ips.
   6. The IP-enabled Prepackaged Cameras shall provide an Ethernet and BNC connectors for hybrid video transmission.
   7. The IP-enabled Prepackaged Cameras shall conform to the ONVIF standard.

1.4 SUBMITTALS

A. Product Data:
   1. Manufacturer's data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.

B. Shop Drawings; include
   1. System device locations on architectural floor plans.
   2. Full Schematic of system, including wiring information for all devices.

C. Closeout Submittals
   1. User manual.
   2. Parts list.
   3. System device locations on architectural floor plans.
   4. Wiring and connection diagram.
   5. Maintenance requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer:
   1. Minimum of [10] years experience in manufacture and design Video Surveillance Devices.

B. Video Surveillance System:
   1. Listed by CSA.
   2. Certified compliant to FCC and CE for the required loads. Test methods are in accordance with Industry Canada and the IEC. Provide evidence of compliance upon request.

C. Installer:
   1. Minimum of [5] years experience installing Video Surveillance System.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacture's original, unopened, undamaged containers; and unharmed original identification labels.

B. Protect store materials from environmental and temperature conditions following manufacturer's instructions.

C. Handle and operate products and systems according to manufacturer's instructions.

D. Bosch provides off-the-shelf availability for our top selling products and same-day or 24-hour shipping.

1.7 WARRANTY

A. Provide manufacturer's warranty covering 3 years for replacement and repair of defective equipment.

1.8 MAINTENANCE

A. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.

B. Provide factory direct technical support from 8:00 a.m. to 8:00 p.m. via phone and e-mail.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
[Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 1450, USA
Phone: + 1 800 289 0096
Fax: + 1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us]

B. Substitutions:
1. Acceptable alternate manufacturers are listed in Section 13700.

2.2 BOSCH KBN AND KBE SERIES PREPACKAGED CAMERAS

A. General Characteristics:
1. The camera housing shall be constructed of an aluminum casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware. The viewing window shall be 3 mm (0.12 in.) thick UV-stabilized polycarbonate.
2. A compatible feed-through wall mount shall be provided by the manufacturer that supports a maximum load of 20 lbs (9 kg). The mount shall have a swivel head that rotates 360º and tilts 180º. To ensure neatness of installation, the mount shall be designed to allow feed through wiring.
3. The prepackaged outdoor camera unit shall meet IP66 and NEMA-4X enclosure protection standards.
4. The prepackaged cameras shall provide a line-lock function that synchronizes the camera to the power line zero crossing to ensure roll-free switching when used with matrix or vertical interval switchers. The unit shall also have the capability to be switched to a crystal-lock mode that eliminates the camera's dependency on the utility power line frequency that can, in many installations, be noisy or unstable.
5. The prepackaged cameras shall provide remote control and setup via Bosch Bilinx bi-directional, coaxial communication capability embedded in the video signal that allows change of camera settings, status checks, and firmware updates to be made from virtually anywhere along the video cable. The Bilinx communication shall use the standard coaxial video cable to transmit alarm and status messages. An optional USB adapter and the software required for remote control and setup using Bilinx communication shall be available from the camera manufacturer.

B. Indoor IP-enabled Day/Night, 1/3 in. High Resolution: KBN-498V28-20NV
1. The product specified shall be a prepackaged camera unit designed for indoor operation. The product, as delivered, shall be a complete system that includes a Bosch Dinion® IP camera with a 2.8-11 mm or a 7.5-50 mm auto iris lens pre-wired into a Bosch housing equipped. The prepackaged indoor cameras shall be pre-wired with 5 feet (1.5 m) of coaxial cable terminated with a female BNC connector, and 5 feet (1.5 m) of pre-wired 18AWG (1 mm^2) 3-conductor power cable having flying leads. All cables shall exit through the base of the housing. The prepackaged unit shall be supplied with a compatible feed-through wall mount. The prepackaged camera unit shall be designed to be fully operational between 12 to 28 VAC, 60 Hz and require 8 watts of power.
2. The IP camera shall be a high-resolution, 1/3 in. format, Dinion IP Day/Night camera that produces 540 TV lines of horizontal resolution. The indoor prepackaged cameras shall be equipped with a factory back-focused 2.8-11 mm or a 7.5-50 mm varifocal, auto iris lens. NightSense technology automatically activates in low light conditions to switch the camera from color operation to monochrome mode and increases the sensitivity up to 9 dB.
3. The IP camera shall offer Power over Ethernet (IEEE 802.3af Class 3) for indoor applications.
4. The IP camera shall be capable of capturing and storing images using H.264 and JPEG encoding and compression at 4CIF/D1 and CIF resolutions.
5. The IP camera shall generate two independent H.264 streams and a JPEG stream simultaneously. Allow streaming high-quality images for live viewing

while recording at a reduced frame rate and, at the same time, stream JPEG images to a remote PDA device.

6. [The IP camera shall offer Embedded Intelligent Video Analytics (IVA) eliminates dedicated PCs and associated software maintenance.]

C. Camera:
   1. Imager:
      a. KBx-4xx: Interline transfer CCD 1/3-inch format
      b. KBx-610/630: Interline transfer CCD 1/2-inch format
   2. Active Picture Elements (H x V):
      a. KBx-498, KBx-630: 768-494
   3. Horizontal Resolution:
      a. KBx-498, KBx-630: 540 TVL
   4. KBx-498V28N Series
      a. Standard:
         1) 50 IRE: 0.65 lux (0.065 fc)
         2) 100 IRE: 2.6 lux (0.26 fc)
      b. NightSense
         1) 50 IRE: 0.26 lux (0.026 fc)
         2) 100 IRE: 1.04 lux (0.104 fc)

D. IP Video
   1. Video Standards: MPEG-4, M□JPEG, H.264 (ISO/IEC 14496□10)
   2. Data Rate: 9.6 kbps to 6 Mbps constant and Variable
   3. Overall IP delay: 240 ms
   4. Resolution
      a. 4CIF 925/30 ips): 704 x 576/480
      b. CIF (25/30 ips): 352 x 288/240
   5. Frame Rate:
      a. 1 to 50/60 (PAL/NTSC): H.264
      b. 1 to 25/30 (PAL/NTSC): M-JPEG
   6. Network Protocols: RTP, Telnet, UDP, TCP, IP, HTTP, ICMP, HTTPS, FTP, DHCP, IGMP V2/V3, ARP, SMTP, SNTP, SNMP, 802.1x, UPnP
   7. Software Update: Flash ROM, remote programmable
   8. Configuration: Using Web browser or Configuration Manager

E. Power
   1. Indoor Models:
      a. Analog Cameras (KBN-xxxVxx-20): 12 to 28 VAC, 60 Hz, 4 W
      b. IP-enabled Cameras (KBN-xxxVxx20N): 12 to 28 VAC, 60 Hz, 8 W (if not using Power over Ethernet)

F. Mechanical
   1. Weight (approx):
      a. Indoor Models: 2.85 kg (6.28 lb)
      b. Outdoor Models: 4.1 kg (9.04 lb)
   2. Construction: Aluminum housing casing, neoprene gaskets, UV-resistant polymer end caps, and all stainless steel hardware
   3. Finish: Gray
   4. Window: 3 mm (0.12 in.) thick UV-stabilized polycarbonate
   5. Mounting: Four (4), 8 mm (5/16 in.) diameter fasteners (not included) are required for mounting

G. Feed-through Mount
   1. Max Load: 9 kg (20 lb)
   2. Size: 30 cm (12 in.)
   3. Weight: 0.4 kg (0.9 lb)

H. Environmental:
   1. Operating Temperature:
      a. KBx-498Vxx-20 Series, KBE-630 Series:
         –20°C to +55°C (–4°F to +131°F) (non-IVA)
   2. Storage Temperature:
      a. KBx-498Vxx-20N and 20 NV Series, KBE-630 Series:
         –40°C to +70°C (–40°F to +158°F)
   3. Operating Humidity:
      a. KBx-498Vxx-20 Series, KBx-498Vxx-20N and 20 NV Series,
         20% to 93% RH
   4. Storage Humidity:
      a. KBx-498Vxx-20 Series, KBx-498Vxx-20N and 20 NV Series,
         up to 98% RH
   5. Enclosure Protection: IP66, NEMA-4X

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.

B. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect devices from damage during construction.

3.3 INSTALLATION

A. Install devices in accordance with manufacturer’s instruction at locations indicated on the floor drawings plans.

B. Perform installation with qualified service personnel.

C. Install devices in accordance with the National Electrical Code or applicable local codes.

D. Ensure selected location is secure and offers protection from accidental damage.

E. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.

3.4 FIELD QUALITY CONTROL

A. Test snugness of mounting screws of all installed equipment.

B. Test proper operation of all video system devices.

C. Determine and report all problems to the manufacturer's customer service department.

3.5 ADJUSTING

A. Make proper adjustment to video system devices for correct operation in accordance with manufacturer's instructions.

B. Make any adjustment of camera settings to comply with specific customer's need.

3.6 DEMOSTRATION

A. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

DIVISION 16 - ELECTRICAL

Index Sheet

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2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 16010
GENERAL ELECTRICAL REQUIREMENTS

16011 PART 1 GENERAL

16011.1 Section Includes:

A. All sections of the bidding documents, Contract Conditions and Division 1 are part of this section.
B. Applicable sections of division 16 are part of this Section of the Specifications.
C. Contractor shall perform all work outlined herein except where specifically stated otherwise. It is the intent of this Division of the specifications to establish the general requirements for electrical work. The work consists of furnishing all labor, equipment and materials, and of performing all operations in connection with the requirements of the electrical work to provide complete fully integrated systems as shown on the Drawings and as specified in the specifications, and as required for proper functioning of all equipment.

16011.2 Coordination With Other Trades

A. Contractor shall cooperate with all other Contractors and subcontractors performing work on this project as necessary to achieve a complete neatly fitted installation for each condition. To that end, contractor shall consult the drawings and Specifications for all trades to determine nature and extent of work specified in other Sections which adjoined or attaches to his work to which his work attaches or joins.
B. Contractor shall confer with other Contractors and Subcontractors at the site to coordinate his work with theirs in view of job conditions to the end that interference's may be eliminated and that maximum headroom and clearance may be obtained. In the event that interference's develop, the Engineer's decision will be final as to which trade will relocate it's work, and no additional compensation will be allowed for the moving of piping, ductwork, conduit or equipment to clear such interference's.
C. Cutting, patching and painting resulting from the contractor's improper location or coordination of the work shall be at no cost to the owner.

16011.3 Quality of Workmanship

A. Execute the work required in a manner evidenced by the "best trade practices," contributing to the efficiency of operation, minimum maintenance, accessibility and aesthetics of the installation.
B. Equipment and materials, unless noted otherwise, shall be new and shall conform to the requirements of standard specifications and tests of Organizations as listed in this division and in the requirements noted in other Sections of division 16.

16011.4 Deviations From Specified Materials

A. The name or make of any article, devices, materials, form of construction, fixture, etc., named in this specification, whether or not the words ”or approved equivalent” are used shall be known as a “standard.”
B. Bidders may submit for consideration substitutions for the standards specified, provided in accordance with Section 01600.

16011.5 Codes and Standards

A. The following codes and standards are hereby incorporated by reference and made a part of this specification (in addition to those noted in Section 01100):
    1. Applicable Federal, State and Local Codes, Ordinances and Regulation, which also shall govern over NEC should a conflict exist.
    2. NEC, (National Electrical Code), latest addition as approved by the local authority having jurisdiction.
    3. NEMA, (National Electrical Manufactures Association) standards, latest revisions.
    4. IEEE, (Institute of Electrical and Electronics Engineers) standards latest revisions.
    5. ANSI (American National Standards Institute), latest revisions.
    6. IPCEA, (Insulated Power Cable Engineers Association), standards, latest revisions.
    7. ASTM, (American Society for Testing of Materials), latest revisions.
    8. MEC, (Michigan Energy Code), latest revisions.
    9. OSHA, (U.S. Occupational Safety and Health Act), latest revisions.
    10. EPA, (U.S. Environmental Protection Agency), latest revisions.
    11. UL (Underwriters’ Laboratories, Inc.), equipment and materials shall bear the “UL” label where labeling service is regularly furnished.
    12. NFPA, (National Fire Prevention Association), latest addition of applicable document.
B. All work shall be in accordance with these codes and standards along with those noted in Section 01085.
C. Notify Engineer in writing and prior to bid opening of conflicts between these codes and standards, and the drawings and specifications.
D. Whenever the requirements of the drawing and specifications exceed those of the applicable codes and standards listed, the requirements of the drawing and specification shall govern.

16011.6 Permits and Inspections

A. Secure permits and inspections required by state and local laws and ordinances; and, pay all fees and expenses in connection therewith as a part of their work under this contract.
B. Upon completion of work, furnish owner certificates of final inspection and approval from authorities having jurisdiction.

16011.7 Operating and Maintenance Data

A. Furnish in accordance with Section 01730.

16011.8 As-Built Drawings (Project Record Documents)

A. Furnish in accordance with Section 01720.
B. As-built drawings shall consist of separate plans for lighting systems, receptacle systems, power systems, communication systems, special signal system such as clock, music, intrusion, paging, watchman systems, fire alarm and smoke detector systems, riser diagrams, etc. Each system drawing shall show location, size and conductor fill for all conduits, junction boxes and outlets.
C. Particular care shall be taken to fully dimension all concealed and underground work performed under the contract.

16011.9 Submittals

A. Submit in accordance with Section 01300.
B. Shop drawings required shall include but not necessarily be limited to the following:
   1. Each type of lighting fixture.
   2. Secondary switchgear.
   3. Circuit breakers.

16011.10 Warranties

A. Furnish in accordance with Section 01740.

16011.11 Evacuation, Trenching and Backfilling

A. Coordinate with Sections 02250 and 02270.

16011.12 Painting

A. Coordinate with Section 09900.
B. Touch-up painted manufacturer's finishes on electrical equipment marred during shipment, construction or installation.
C. Prime paint all bare metal electrical equipment supports, platforms, etc.
D. Fronts of all flush cabinets shall have priming coat only, finishing coats will be covered in Section 09900.
E. Painting shall conform to the requirements of Division 9 of these specifications.

16011.13 Cutting and Patching

A. This Contractor shall be held responsible for all cutting and patching of building construction for work of the section unless otherwise indicated by general trades contractor.
B. Cutting and building of structural parts of building construction shall not be done without the written consent of the Engineer.
C. Any and all cutting of the building made necessary by the improper location of this work, or by the failure to build such work into the structure, shall be done at the expense of the Contractor.
D. All measurements necessary for the proper installation of materials or apparatus shall be taken in the field. The Contractor will be held responsible for the correct fit of work installed.

16011.14 Parts Receipt

A. The Electrical Contractor shall retain all portable and detachable portions of the installation in his possession such as keys, tools, wiring diagrams, manuals, etc., until the completion of the work and shall then turn them over to the Owner, or his authorized representative and obtain an itemized receipt.
B. This receipt shall be attached to the request for final payment of electrical work.

16011.15 Description of Voltage Systems

A. Service shall be 120/208 volts, 60 Hertz, 3 phase, 4 wire, solidly grounded neutral at the high school and 120/240 volts, 60 Hertz, 3 phase, 4 wire, solidly grounded neutral at the elementary school. Sports lighting at the football field shall be 240/480 volts 60 Hertz, 1 phase, 3 wire, solidly grounded neutral.
B. Exit lighting system shall be 120 volts, 60 Hertz, single phase, 2 wire, solidly grounded neutral.
C. Emergency lighting system shall be battery operated units as specified hereinafter.

16011.16 Local Conditions

A. The Contractor shall visit the site and shall familiarize himself with conditions which will affect the work he is to perform. The submission of a proposal by this contractor shall be conclusive evidence that this Contractor has visited the site and has given proper consideration and evaluation of these conditions in the preparation of his proposal. No allowance shall subsequently be made in his behalf for extra expense incurred due to failure or neglect on his part to make this visit and examination.
B. Where active sewers, gas, electric, or other services are encountered during the performance of this contract, the Contractor shall protect, brace and support them as required. Do not prevent, interrupt or disturb operation of existing services that are to remain. Relocate existing services if required.
C. Drawings show approximate locations of existing services. The Contractor shall check with utility companies and municipal agencies for exact locations of services which they may expect to encounter.

16011.17 Mounting Heights

A. In general, mounting heights above finished floor to the top of boxes and equipment shall be as follows unless otherwise indicated on the Drawings or as specified by Barrier Free Codes:

1. Bracket Mirror Lighting Fixtures	Above Mirror
2. Bracket Exit Lighting Fixtures	7’-6” w/8’-0” ceiling 8’-0” w/9’-0” and up ceiling
3. Switches	4’-0”
4. Receptacles (finished areas)	1’-6”
5. Receptacles (mechanical rooms)	3’-0”
6. Telephone Outlets (for desk mtd phones)	1’-6”
7. Telephone Outlets (for wall mtd phones)	4’-10”
8. Telephone Outlet (for pay phones)	3’-0”
9. Safety Switches	6’-0” to top
10. Motor Starters	5’-0”

11. Panels	6’-0” to top of panel providing bottom of cabinet is not less than 1’-0” above floor 5’-0”
12. Pushbuttons	

END OF SECTION

SECTION 16210
CIRCUIT BREAKERS AND SWITCHES

16211 PART 1 - GENERAL

16211.1 Section Includes:

A. Approved manufacturers of equipment and materials to be used on this project.

16212 PART 2 - PRODUCTS

16212.1 Circuit Breakers

A. Shall be molded plastic case type, bolt on type, AC-DC, quick-made, quick-break, with inverse item thermal and instantaneous magnetic trip device, common trip, and trip free operating mechanism. The external operating handle shall have position indication.

B. Circuit breakers shall be of the voltage, thermal trip, and minimum interrupting capacity ratings indicated on the Drawings. All circuit breakers shall have minimum ratings of 10,000 AIC at 120/240 volts, and 14,000 AIC at 277/480 volts.

16212.2 Disconnect Switches NEMA Heavy Duty

A. Shall be NEMA Heavy Duty (HD), fusible type, quick-made, quick-break type, with full cover interlock. Switches rated 200 amperes or less shall be horsepower rated. Enclosure shall be horsepower rated. Enclosure shall be NEMA 1 unless otherwise noted. Means for padlocking the operating handle in the “open” or “closed” position shall be provided. Switches shall be 3 pole, single throw, unless otherwise noted. Switches shall be of the voltage ratings and current carrying capacities indicated on the Drawings. All switches shall be heavy duty type.

END OF SECTION

SECTION 16300
RACEWAY SYSTEMS

16301 PART 1 - GENERAL

16301.1 Section Includes:

A. Approved manufacturer of equipment and materials to be used on this project.

16302 PART 2 - PRODUCTS

16302.1 Conduit

A. Rigid steel conduit, elbows and coupling shall be hot dipped galvanized threaded type and conform to the latest ANSI Specification for Rigid Steel Conduit, zinc-coated. Bolt type couplings are not acceptable.
B. Enameled, rigid, steel conduit: Conduit, elbows and couplings shall conform to the latest ANSI Specifications for rigid steel conduit, enameled.
C. Asbestos-cement conduit: Is not acceptable.
D. Electric metallic tubing and elbows shall be zinc-coated steel conforming to the latest ANSI Specification for Electric Metallic Tubing, Zinc-coated.
E. Plastic conduit shall be high strength smooth inner wall polyvinyl chloride, heavy wall type for use as direct burial without concrete encasement. Couplings shall be the solvent welded type.
F. Liquid-type flexible steel conduit and fittings shall be flexible steel with a PVC jacket.
G. Galvanized flexible steel conduit and fittings shall be zinc-coated, single strip indoor type. Fittings shall maintain the grounding feature of the raceway.

16302.2 Conduit Fittings

A. Liquid-tight flexible steel conduit fittings shall be designed to maintain the liquid-tight and grounding feature of the installation, and shall be Appleton STG Series or approved equivalent.
B. Locknuts and bushings for rigid steel conduit: Locknuts shall be made of malleable iron or steel, zinc or cadmium plated. Bushings shall be made of malleable iron or steel, or plastic. Malleable iron or steel bushings shall be zinc or cadmium plated and shall have an insulating insert of thermosetting plastic molded and locked into the bushing ring. Plastic bushings shall be thermosetting phenolic insulating type. The use of non-rigid plastic bushings is prohibited.

16302.3 Conduit Boxes

A. Conduit boxes, outlet switch, junction and pull boxes, extension rings, adapters and cover plates shall be sherardized, galvanized or cadmium plated. Boxes for concealed work shall be stamped steel bodies with stamped steel accessories. Boxes for exposed work shall be cast or malleable iron. Flush mounted boxes for multiple outlets shall be of the gang type and shall not be less than 1 1/2" deep. Plaster rings shall be not less than 1/2" deep. Boxes for ceiling outlets in concrete slabs shall be not less than 3" deep. Junction and pull boxes for use where exposed to the weather shall be cast aluminum, with gasketed cover plates and secured with tamperproof screws. Special junction and pull boxes

shall be of the type and minimum dimensions indicated on the Drawings. All boxes shall conform the NEC requirements for wiring space.

B. Conduit Boxes for Rigid Steel Conduit:
   1. Outlet, switch, junction, and pull boxes, extension rings, adapters and cover plates shall be sherardized, galvanized, or cadmium plated. Boxes for concealed work shall be stamped steel bodies with stamped steel accessories. Boxes for exposed work shall be cast or malleable iron.
   2. Flush mounted boxes for single outlets shall be not less than 4" square and 2-1/8" deep. Flush mounted boxes for multiple outlets shall be of the gang type and shall be not less than 2 1/4" deep and not less than 3" deep for ceiling boxes. Plaster rings shall be not less than 1/2" deep.
   3. Special junction and pull boxes shall be of the type and minimum dimensions indicated on the Drawings. All boxes shall conform to NEC requirements for wiring.

16302.4 Miscellaneous Raceways

A. Wire Duct shall consist of a steel enclosure with a hinge, or screw fastened cover, and shall be of sizes indicated on the Drawings. Wire duct shall be listed by U.L. bends, elbows, tees, crosses, adapters and other accessories shall comply with all requirements of the NEC, latest edition, and shall be easily assembled into a complete system.

16303 PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

SECTION 16470
PANELBOARDS

16471 PART I - GENERAL

16471.1 Section Includes

A. Power Distribution Panelboard - Furnish and install distribution panelboard as specified herein and where shown on the associated drawings.
B. Lighting and Appliance Panelboard - Furnish and install lighting and appliance panelboards are specified herein and where shown on the associated drawings.

16471.2 References

The panelboard(s) and circuit breaker(s) referenced herein are designed and manufactured according to the latest revision of the following specifications.

A. NEMA PB 1 - Panelboards.
B. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
C. NAME AB 1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
D. NEMA AB 1 - Molded Case Circuit Breakers.
E. UL 50 - Enclosures for Electrical Equipment.
F. UL 67 - Panelboards.
G. UL 98 - Enclosed and Dead-front Switches.
H. UL 489 - Molded - Case Circuit Breakers and Circuit Breaker Enclosures
I. CSA Standard C22.2 No. 29-M1989 - Panelboards and Enclosed Panelboards.
J. CSA Standard C22.2 No. 5-M91 - Molded Case Circuit Breakers.
K. Federal Specification W-P-115C - Type I Class 1
L. Federal Specification W-P-115C - Type II Class 1
M. Federal Specification W-C-375B/Gen - Circuit Breakers, Molded Case, Branch Circuit and Service.
N. Federal Specification W-C-865C - Fusible Switches.
O. NFPA 70 - National Electrical Code (NEC).
P. ASTM - American Society of Testing Materials.

16471.3 Submittal and Record Documentation

A. Approval documents shall include drawings. Drawings shall contain overall panelboard dimensions, interior mounting dimensions, and wiring gutter dimensions. The location of the main, branches, and solid neutral shall be clearly shown. In addition, the drawing shall illustrate one line diagrams with applicable voltage systems.

16471.4 Delivery, Storage and Handling

A. Inspect and report concealed damage to carrier within their required time period.
B. Handle carefully to avoid damage to panelboard internal components, enclosure, and finish.
C. Store in a clean, dry environment. Maintain factory packaging and, if required, provide an additional heavy canvas cover to protect enclosure(s) fro dirt, water, construction debris, and traffic.

16471.5 Operations and Maintenance Materials

A. Manufacturer shall provide installation instructions and NEMA Standards Publication PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

16471.6 Warranty

A. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for the lesser of one (1) year from the date of installation or eighteen (18) months from the date of purchase.

16472 PART 2 - PRODUCTS

16472.1 Manufacturers

A. Shall be Square D Company or ITE Company.

   1. NQOD - Class 1630.

B. Substitutions must be submitted in writing three weeks prior to original bid date with supporting documentation demonstrating that the alternate manufacturer meets all aspects of the specification herein.

16472.2 Lighting and Appliance Panelboard Type

A. NQOD

   1. Interior

      a. Shall be type NQOD panelboard rated for 240 VAC/48 VDC maximum. Continuous main current ratings, as indicated on associated schedules, not to exceed 600 amperes maximum.

      b. Minimum short circuit current rating: 10,000 in rms symmetrical amperes at 240 VAC.

      c. Short circuit current rating: 5,000 at 48 VDC.

      d. Provide one (1) continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors suitable for plug-on or bolt-on branch circuit breakers. The bussing shall be fully rated. Panelboard bus current ratings shall be determined by heat-rise tests conducted in accordance with UL 67. Bussing rated 100-400 amperes

shall be copper. Bussing rated for 600 amperes shall be copper as standard construction. Panelboards shall be suitable for use as Service Equipment when application requirements comply with UL 67 and NEC Articles 230-F and -G.

e. All current-carrying parts shall be insulated from ground and phase-to-phase by Noryl high dielectric strength thermoplastic or equivalent.

f. Split solid neutral shall be plated and located in the mains compartment up to 225 amperes so all incoming neutral cable may be of the same length.

g. Interior trim shall be of dead-front construction to shield user from energized parts. Dead-front trim shall have pre-formed twistouts covering unused mounting space.

h. Nameplates shall contain system information and catalog number or factory order number. Interior wiring diagram, neutral wiring diagram, UL Listed label and short circuit current rating shall be displayed on the interior in a booklet format.

i. Interiors shall be field convertible for top or bottom incoming feed. Main and sub-feed circuit breakers shall be vertically mounted. Main lug interiors up to 400 amperes shall be field convertible to main breaker. Interior leveling provisions shall be provided for flush mounted applications.

2. Main Circuit Breaker

a. Shall be Square D type circuit breakers.

b. Main circuit breakers shall have an overcenter, trip-free, toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have a permanent trip unit with thermal and magnetic trip elements in each pole. Each thermal element shall be true rms sensing and be factory calibrated to operate in a 40° C ambient environment. Thermal elements shall be ambient compensating above 40° C.

c. Two-and three-pole circuit breakers shall have common tripping of all poles. Circuit breakers frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker which allows the user to simultaneously select the desired trip level of all poles. Circuit breakers shall have a push-to-trip button for maintenance and testing purposes.

d. Breaker handle and faceplate shall indicate rated ampacity. Standard construction circuit breakers shall be UL Listed for reverse connection without restrictive line or load markings.

e. Circuit breaker escutcheon shall have international I/O markings, in addition to standard ON/OFF markings. Circuit breaker handle accessories shall provide provisions for locking handle in the ON or OFF position.

f. Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 75° C rated wire. Lug body shall be bolted in place; snap-in designs are not acceptable.

g. The circuit breakers shall be UL Listed for use with the following accessories. Shunt Trip, Under Voltage Trip, Ground Fault Shunt Trip, Auxiliary Switch, Alarm Switch, Mechanical Lug Kits, and Compression Lug Kits.

3. Branch Circuit Breakers

a. Shall be Square D type circuit breakers. Circuit breakers shall be UL Listed with amperage ratings, interrupting ratings, and number of poles as indicated on the panelboard schedules.

b. Molded case branch circuit breakers shall have (bolt-on) (plug-on) type bus connectors.

c. Circuit breakers shall have an overcenter toggle mechanism which will provide quick-make, quick-break contact action. Circuit breakers shall have thermal and magnetic trip elements in each pole. Two- and three-pole circuit breakers shall have common tripping of all poles.

d. There shall be two forms of visible trip indication. The breaker handle shall reside in a position between ON and OFF. In addition, there shall be a red VISI-TRIP® indicator appearing in the clear window of the circuit breaker housing.

e. The exposed faceplates of all branch circuit breakers shall be flush with one another.

f. Lugs shall be UL Listed to accept solid or stranded copper and aluminum conductors. Lugs shall be suitable for 75° C rated wire.

g. Breakers shall be UL Listed for use with the following factory installed accessories: Shunt Trip, Auxiliary Switch, Alarm Switch.

4. Enclosures

   a. Type I Boxes

      1. Boxes shall be galvanized steel constructed in accordance with UL 50 requirements. Galvanealed steel will not be acceptable.
      2. Boxes shall have removable endwalls with knockouts located on one end. Boxes shall have welded interior mounting studs. Interior mounting brackets are not required.
      3. Box width shall be 20 in. wide.

   b. Type I Fronts

      1. Front shall meet strength and rigidity requirements per UL 50 standards. Front shall have ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
      2. Fronts shall be 1-piece with door. Mounting shall be as indicated on associated drawings.
      3. Panelboards rated 225 amperes and below shall have MONO-FLAT fronts with concealed door hinges and trim screws. Front shall not be removable with the door locked. Panelboards rated above 225 amperes shall have fronts with trim clamps and concealed door hinges. Front doors shall have rounded corners and edges shall be free of burrs.
      4. Front shall have cylindrical tumbler type lock with catch and spring-loaded stainless steel door pull. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic directory card holder shall be mounted on the inside of door.

   c. Type 3R, 3S, 5, and 12

      1. Enclosures shall be constructed in accordance with UL 50 requirements. Enclosures shall be painted with ANSI 49 gray enamel electrodeposited over cleaned phosphatized steel.
      2. All doors shall be gasketed and equipped with a tumbler type vault lock and two (2) additional trunk type latches. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock. A clear plastic card holder shall be mounted on the inside of door.
      3. Maximum enclosure dimensions shall not exceed 20 in. wide and 6.5 in. deep.

16473 PART 3 - EXECUTION

(Not Applicable)

END OF SECTION

SECTION 16500
LIGHTING

16501 PART 1 - GENERAL

16501.1 Section Includes

A. Luminaires and Lampholders.
B. Lamps.
C. Ballasts.

16502 PART 2 - PRODUCTS

16502.1 Luminaries and Lampholders

NOTE: The terms “Luminaries and “Lighting Fixture” are used interchangeably.

A. Manufacturers: Provide Products of manufacturer listed for each luminaire and lampholder in luminaire schedule on Drawings. Substitute products of other manufacturers under provisions of Section 01100.
B. Description: Provide Products meeting requirements listed for each luminaire and lampholder in luminaire schedule.
C. Service Conditions: Provide Products suitable for use under service conditions listed for each luminaire and lampholder in luminaire schedule.
D. Accessories: Provide required accessories for mounting and operation of each luminaire as indicated.
    1. Thermal Protection: Provide thermal protection and current limiting devices to meet NFPA 70 requirements.
E. Coordinate ceiling construction types to verify proper trims are provided on all fixtures.

16503 PART 3 - EXECUTION

16503.1 Examination and Preparation

A. Examine adjacent surfaces to determine that surfaces are ready to receive work.

16503.2 Installation

A. Install luminaires and accessories in accordance with manufacturer’s instructions.
    1. Install lamps in luminaires and lampholders.

16503.3 Adjusting and Cleaning

A. Align luminaires and clean lenses and diffuser at completion of Work.
B. Aim adjustable luminaires and lampholders as directed.
C. Cleanly paint splatters, dirt, and debris from installed luminaires.
D. Touch-up luminaire and pole finish at completion of work.
E. Relamp luminaires which have failed lamp at completion of work

END OF SECTION

SECTION 16520
SPORTS FIELD LIGHTING

16521 PART 1 – GENERAL

16521.1 SUMMARY

A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.

B. The purpose of these specifications is to define the performance and design standards for Hudson High School Football, in Hudson, MI. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth by the criteria set forth in these specifications.

C. The sports lighting will be for the following fields:
   1. Base Bid - Football 50 footcandles
   2. Alternate 300-1 Bid – Football 40 footcandles (deduct)

D. The primary goals of this sports lighting project are:
   1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore the lighting system shall be designed such that the light levels are guaranteed for a period of 25 years.
   2. Life Cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated, and the field(s) should be proactively monitored to detect fixture outages over a 25 year life cycle. To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system.

16521.2 LIGHTING PERFORMANCE

A. Performance Requirements: Playing surfaces shall be lit to an average constant light level and uniformity as specified in the chart below. Light levels shall be held constant for 25 years. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Measured average illumination level shall be +/- 10% of predicted mean in accordance with IESNA RP-6-01, and measured at the first 100 hours of operation.

BASEBID

Area of Lighting	Average Constant Light Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football	50 footcandles	2.0:1.0	72	30’ x 30’
North Parking	2 footcandles	60.0:1.0	56	30’ x 30’
South Area	2 footcandles	90:1.0	196	30’ x 30’

ALTERNATE BID

Area of Lighting	Average Constant Light Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football	40 footcandles	2.0:1.0	72	30’ x 30’
North Parking	2 footcandles	85.0:1.0	56	30’ x 30’
South Area	2 footcandles	108.0:1.0	196	30’ x 30’

B. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, the pole mounting heights from the playing field surface shall be 60’ for poles F1 and F2, and 70’ for poles F3 and F4.

16521.3 ENVIRONMENTAL LIGHT CONTROL

A. Spill Light Control: Maximum horizontal footcandles at the roadways from the perimeter of the field shall not exceed 0.70 footcandles. Average horizontal footcandles at the roadways from the perimeter of the field shall not exceed .55 footcandles. Footcandle readings shall be taken at 30' intervals along the specified line. Measured average illumination level shall allow a 10% variance of predicted mean in accordance with IESNA RP-6-01, and be measured at the first 100 hours of operation.

16521.4 LIFE CYCLE COSTS

A. Energy Consumption: The average kWh consumption for the field lighting system shall be 76.5 or less for basebid of 50 footcandles and 64.7 or less for alternate bid of 40 footcandles.

B. Complete Lamp Replacement: Manufacturer shall include all group lamp replacements required to provide 25 years of operation based upon 200 usage hours per year.

C. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual lamp outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The manufacturer shall notify the owner of outages within 24 hours, or the next business day. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed).

E. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

   The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields, to only having permission to execute "early off" commands by phone.

   Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

F. Management Tools: Manufacturer shall provide a web-based database of actual field usage and provide reports by facility and user group.

G. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system for a period of 25 years.

H. 25-Year Life Cycle Cost: Manufacturer shall submit 25-year life cycle cost calculations as follows. Equipment price and total life cycle cost shall be entered separately on bid form.

a.	**Luminaire energy consumption** # luminaires x __kW demand per luminaire x .10 kWh rate x 200 annual usage hours x 25 years		
b.	**Demand charges, if applicable**	+	
c.	**Cost for spot relamping and maintenance over 25 years** Assume 8 repairs at $600 each if not included with the bid	+	
d.	**Cost to relamp all luminaires during 25 years** 200 annual usage hours x 25 years / lamp replacement hours x $125 lamp & labor x # fixtures if not included with the bid	+	
e.	**Extra energy used without base bid automated control system** $ Energy consumption in item a. x 10% if control system not included with the bid	+	
	TOTAL 25-Year Life Cycle Operating Cost	=	

16521.5 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years OR for the maximum hours of coverage based on the estimated annual usage, whichever occurs first. Warranty shall guarantee light levels; lamp replacements; system energy consumption; monitoring, maintenance and control services, spill light control, and structural integrity. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty may exclude fuses, storm damage, vandalism, abuse and unauthorized repairs or alterations.

16521.6 DELIVERY TIMING

A. Equipment On-Site: The equipment must be on-site 4-6 weeks from receipt of approved submittals and receipt of complete order information.

16521.7 PRE-BID SUBMITTAL REQUIREMENTS

A. Approved Product: Musco's Light-Structure Green™ System is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

B. Design Approval: The owner / engineer will review pre-bid shop drawings from the manufacturer's to ensure compliance to the specification. If the design meets the design requirements of the specifications, a letter will be issued to the manufacturer indicating approval for the specific design submitted.

16521.8 ALTERNATE SYSTEM REQUIREMENTS

A. Compliance to Specifications: Acceptance of a bid alternate does not negate the contractor and lighting manufacturer's responsibility to comply fully with the requirements of these specifications. Any exceptions to the specifications must be clearly stated in the prior approval submittal documents.

B. Light Level Requirements: Manufacturer shall provide computer models guaranteeing light levels on the field over 25 years. If a constant light level cannot be provided, a maximum Recoverable Light Loss Factor of 0.70 shall be applied to the initial light level design to achieve the following Initial and maintained light levels. For alternate systems, scans for both initial and maintained light levels shall be submitted.

BASE BID – 50 FOOTCANDLES

Area of Lighting	Average Initial Light Levels	Average Target/Maintained Light Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football	71.4 footcandles	50 footcandles	2.0:1.0	72	30' x 30'
North Parking	2.9 footcandles	2.0 footcandles	60:1.0	56	30' x 30'
South Area	2.9 footcandles	2.0 footcandles	90:1.0	196	30' x 30'

ALTERNATE 300-1 BID – 40 FOOTCANDLES (DEDUCT)

Area of Lighting	Average Initial Light Levels	Average Target/Maintained Light Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Football	57.1 footcandles	40 footcandles	2.0:1.0	72	30' x 30'
North Parking	2.9 footcandles	2.0 footcandles	85:1.0	56	30' x 30'
South Area	2.9 footcandles	2.0 footcandles	108:1.0	196	30' x 30'

C. Revised Electrical Distribution: Manufacturer shall provide revised electrical distribution plans to include changes to service entrance, panel, and wire sizing.

16521.9 ELECTRICAL SYSTEM REQUIREMENTS

A. Contractor Responsibility: The installing contractor shall be responsible for providing the equipment and installation of a complete and operational system commencing from the load side of the service transformer and terminating at the safety disconnect within the electrical enclosure, 10' above grade, on each lighting pole. The electrical contractor shall coordinate the transformer and switchgear locations, as well as identifying the voltage and phase of the service, with the local power company and the Owner's representative before any equipment is installed.

B. Electric Power Requirements for the Sports Lighting Equipment:

Electric power: 480 Volt, single Phase

C. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

D. System Design

1. The electrical system equipment shall consist of:
   a. Conductors and conduit from the main service transformer to the service entrance panel board.
   b. The service entrance panel board with appropriate individual circuit over-current protection. The panel board shall meet local and National Electrical Code (NEC) requirements for the size of the service, AIC rating, and the type of the environment to which it will be exposed. All feeder breakers shall be bolt on type.

c. Conductors and conduit for the feeder circuit from the service entrance panel board (or from the contactor panel if applicable) to the safety disconnect mounted in the electrical enclosure on each lighting pole 10' above grade.

d. Grounding conductors and grounding methods for the following:

(1) The main service entrance panel board. (per NEC or local codes)

(2) The lighting contactor enclosure. (per NEC or local codes)

(3) Each electrical component enclosure mounted on the lighting poles. (Equipment Grounding System) (per NEC or local codes)

(4) Lightning Protection for individual poles as follows (per NFPA 780):

(a) A 5/8 inch x 8 foot copper-clad grounding electrode buried vertically in undisturbed earth. The bottom tip of the grounding electrode should reach a minimum of 10 feet below grade.

(b) A copper grounding electrode conductor shall be connected to the top of the grounding electrode and extend and connect to the grounding lug located inside the handhole of the pole approximately 10 feet above grade. The size of this conductor shall be 2 AWG if the pole is 75 feet in height or less, and 2/0 AWG if the pole is greater than 75 feet.

2. Underground wiring shall be all copper wire and shall be installed in PVC Schedule 40 conduit and shall be buried to a depth meeting the NEC and local electrical codes. Acceptable copper wire types need to comply with any local requirements, but will be labeled either THHN or THWN. If above ground conduit must be used, it shall be rigid galvanized steel. Conduit elbows located at the electrical panel should be rigid conduit, as opposed to PVC.

E. Trenching or Directional Boring

1. The installing contractor shall be responsible for locating all underground utilities including, but not limited to, natural gas, electric, water, sewer, cable TV and telephone.

2. The owner shall be responsible for locating and staking any underground facilities that are not utility related. Owner accepts responsibility for damage to such facilities that are not properly located or staked.

3. Trenching depth and width shall be adequate to install appropriately sized conduit and to meet local and National Electrical Codes.

4. Trenches shall be back-filled with excavated soil and compacted to approximately the same density of the surrounding soil to minimize settlement.

5. No trench line or feeder circuit shall cross the playing area.

F. Design Standards

1. All circuits shall be designed so as not to exceed a 3% voltage drop at the safety disconnect in the electrical enclosure near the base of each pole.

2. All work shall meet local and National Electrical Codes. It shall be the installing contractors' responsibility to correct any work deemed unacceptable by local electrical inspectors.

3. All electrical components shall be UL Listed for the appropriate application.

4. Each pole shall be on a dedicated circuit. If common poles are to be used, or a pole is to have fixtures on a separate circuit, another dedicated circuit shall be ran to that pole. Consult lighting equipment specifications and lighting manufacturer for special circuitry information.

5. If any pole utilizes a Momentary Power Interrupt (MPI) lighting fixture(s) and the system voltage is 480, the installing contractor must run an appropriately sized neutral conductor to each pole with the MPI fixture. If a neutral conductor is not available, the installing contractor must provide a step down transformer to allow the MPI fixture(s) to operate at either 208v, 240v, or 277 volts.

G. Submittal Information

The successful contractor shall provide an electrical plan/schematic, detailing all of the equipment described above, to the owner prior to commencing work. This electrical plan/schematic shall bear the stamp of an Electrical Engineer with P.E. status within the State of Michigan.

16522 PART 2 – PRODUCT

16522.1 LIGHTING SYSTEM CONSTRUCTION

A. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and crossarm assembly
2. Pre-stressed concrete base embedded in concrete backfill allowed to cure for 12-24 hours before pole stress is applied. Alternate may be an anchor bolt foundation designed such that the steel pole and any exposed steel portion of the foundation be located a minimum of 18 inches above final grade. Anchor bolt foundation concrete must cure for a minimum of 28 days before the pole stress is applied.
3. All luminaires shall be constructed with a die-cast aluminum housing or external hail shroud to protect the luminaire reflector system.
4. Manufacturer will remote all ballasts and supporting electrical equipment in aluminum enclosures mounted approximately 10' above grade. The enclosures shall include ballast, capacitor and touch-safe fusing to indicate when a fuse is to be replaced for each luminaire. Safety disconnect per circuit for each pole structure will be located in the enclosure.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. Controls and Monitoring Cabinet to provide on-off control and monitoring of the lighting system, constructed of NEMA Type 4 aluminum. Communication method shall be provided by manufacturer. Cabinet shall contain custom configured contactor modules for 30, 60, and 100 amps, labeled to match field diagrams and electrical design. Manual Off-On-Auto selector switches shall be provided.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated for protection against corrosion and stress corrosion cracking. All wiring shall be enclosed within the crossarms, pole, or electrical components enclosure.

C. Lightning Protection: All structures shall be equipped with lightning protection meeting NFPA 780 standards. Contractor shall install ground rod per section

D. Safety: All system components shall be UL Listed for the appropriate application.

16522.2 STRUCTURAL PARAMETERS

A. Support Structure Wind Load Strength: Poles and other support structures, brackets, arms, bases, anchorages and foundations shall be determined based on the 2006 IBC Building Code, wind speed of 90, exposure category C and an importance factor of 1.0. Luminaire, visor, and crossarm shall withstand 150 mph winds and maintain luminaire aiming alignment.

B. Structural Design: The stress analysis and safety factor of the poles shall conform to AASHTO 2001 (LTS-4) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

C. Soil Conditions: The design criteria for these specifications are based on soil design parameters as outlined in the geotechnical report. If a geotechnical report is not provided by the owner, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2006 IBC.

It shall be the contractor's responsibility to notify the owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the owner's approval / payment for additional costs associated with:

a) Providing engineered foundation embedment design by a registered engineer in the State of Michigan
b) Additional materials required to achieve alternate foundation.
c) Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

D. Foundation Drawings: Project specific foundation drawings stamped by a registered engineer in the state where the project is located are required. The foundation drawings must list the moment, shear (horizontal) force, and axial (vertical) force at ground level for each pole. These drawings must be submitted at time of bid to allow for accurate pricing.

16523 PART 3 – EXECUTION

16523.1 CONTRACTOR'S DUTIES

All work performed under this contract shall be performed in accordance with all provisions of these specifications and drawings. Any deviations from the specifications or plans must be approved in writing by the owner or his representative.

A. Initial site inspection: The contractor shall be presumed to have made a reasonable inspection of the premises prior to the time of bidding and shall be held responsible for all information available through such inspection. The contractor shall immediately upon discovery, bring to the attention of the owner any conflicts that may occur among the various provisions of the specifications and plans. The owner shall resolve such conflicts and shall be responsible for any costs reasonably incurred by the contractor due to such conflict. Failure of the contractor to bring conflicts or exceptions to the attention of the owner shall allow the owner to require any change deemed necessary before acceptance by the owner.

B. Insurance Requirements:

1. Contractor's and Subcontractor's Insurance: The contractor shall not commence work under this contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the owner, nor shall the contract allow any subcontractor to commence work on his sub-contract until the insurance required of the subcontract has been so obtained and approved.

2. Workman's Compensation Insurance: The contractor shall procure and shall maintain during the life of the contract, Workman's Compensation Insurance and Death Liability Insurance for all of the employees engaged in work on the project under the contract, and in case any such work is sublet, the contractor shall require the subcontractor similarly to provide Workman's Compensation Insurance and Death Liability Insurance for all of the latter's employees engaged in such work unless such employees engaged in hazardous work on the project under his contract are not protected under Workman's Compensation Statute, the contractor shall provide and shall cause each subcontractor to provide adequate employer's general liability insurance for the protection of such of his employees not otherwise protected.

3. Contractor's Public Liability and Property Damage Insurance : The contractor shall procure and shall maintain during the life of this contract, Contractor's Public Liability Insurance in an amount not less than $500,000 for injuries, including accidental death to any one person and subject to the same limit for each person in an amount not less than $500,000 on account of one accident, the Contractor's Property Damage Insurance in an amount not less than $100,000 each occurrence and aggregate.

4. Subcontractor's Public Liability and Property Damage Insurance: The contractor shall require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance of the type specified in subparagraph 3 hereof in the amount specified.

5. Automobile Public and Property Damage Insurance: The contractor shall require each of his subcontractors to procure and to maintain during the life of his subcontract, Automobile Public Liability Insurance in an amount not less than $500,000 single limit for injuries, including accidental death and property damage. Insurance for automobiles shall include: the contractor's owned automobiles and trucks, hired automobiles and trucks, and automobiles and trucks not owned by the contractor.

C. Bonding: The successful contractor shall furnish a performance bond in an amount equal to one hundred percent (100%) of the contract as security for the faithful performance of this contract, and a labor and material payment bond in an amount of one hundred percent (100%), or in the penal sum not greater than that prescribed by state, territory, or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The bonds shall be written by a surety licensed to do business in the locale in which the work is being performed and shall be satisfactory to the owner.

The successful contractor shall, upon completion of the project, protect the owner against defective materials or faulty workmanship for a period of two (2) years. The contractor, at the owner's request, shall furnish a maintenance bond for the above outlined maintenance term. This bond shall be in an amount not to exceed one hundred percent (100%) of the contract price.

D. Codes, Permits and Licenses: All work shall comply with the applicable rules of the National Electrical Code, the National Electrical Safety Code, the National Fire Codes, (published by the National Fire Protection Association), state and local codes and ordinances, and the terms and conditions of the services of the electrical utility, as well as any other authorities that may have lawful jurisdiction pertaining to the work specified. None of the terms or pro-visions of this specification shall be construed as waiving any of the rules, regulations or requirements of these authorities. The contractor shall procure all necessary permits or licenses to carry out his work, and shall pay the lawful fee therefore, as well as for any inspection fee or the cost of a certificate of approval.

In any instance where these specifications call for materials for construction of a better quality or larger size than required by the codes, the provisions of these specifications shall take precedence. The codes shall govern in the case of direct conflict between the codes and the plans and the specifications.

16523.2 MATERIALS

A. Approved Materials: All materials supplied by the contractor under the provisions of these specifications and plans shall be new materials of the kind and character called for by the specifications. Defective equipment or material damaged in the course of installation or tests shall be replaced or repaired in a manner satisfactory to the owner. All materials and equipment to be furnished under these specifications shall be the standard product of a manufacturer regularly engaged in the production of such material and shall be the manufacturer's current standard design.

B. Alternate Materials: The materials specified have been determined to have characteristics appropriate for the purposes of this project. Alternate materials will only be considered as a substitute bid on a separate substitution sheet. No bid will be approved which proposes to use a non-approved substitute. Substitutions will not be considered in determining the lowest responsive bid. The owner reserves the right to reject any or all bids.

16523.3 SITE ACCESS

A. Contractor Access: For the performance of the contract, the contractor will be permitted to occupy such portions of the site as shown on the plans, or as permitted by the owner or his representative. A reasonable amount of tools, materials or equipment for construction purposes may be stored in such place, but not more than is necessary to avoid delays in construction. Excavated and waste materials shall be piled or stocked in such a way as to not interfere with spaces that may be designated to be left free and unobstructed, not to inconvenience other contractors or the owners.

   Upon completion of the work and before acceptance and final payment is made, the contractor shall clean and remove from the site of the work, surplus and discarded materials, temporary structures and debris of every kind. The contractor shall leave the site of work in a neat and orderly condition equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the owner.

B. Owner's Access: The owner's representative shall at all times have access to the work site. The contractor shall keep the owner advised of the progress of the project and shall provide opportunity for the owner or his representative to inspect each phase of the project. The contractor shall provide proper and safe facilities for such access and for inspection.

16523.4 REPLACEMENT OF DAMAGED PROPERTY

A. The contractor shall replace all property damaged by him including fences, trees, plants, grass, walks, drives, building surfaces, etc.

16523.5 INSTALLATION

A. Manufacturer's Instructions: Written instructions for the installation of the sports lighting equipment shall be provided by the manufacturer. The contractor shall review the instructions prior to beginning installation and review any areas of concern with the manufacturer.

B. Manufacturer Representative: A qualified representative from the sports lighting manufacturer shall be available to provide installation guidance if required by the contractor.

C. Handling of Equipment: The lighting equipment shall be handled in an appropriate manner to ensure safe installation and prevent damage to the equipment. Repair or replacement of damaged component shall be the responsibility of the installing contractor.

D. Rigging: Use the appropriated rated web fabric slings to lift components into position. Chains or cables shall not be allowed due to potential failure and damage to components.

E. Clean-up: Upon completion of the work and before acceptance and final payment is made, the contractor shall clean and remove from the site of the work, surplus and discarded materials, temporary structures and debris of every kind. The contractor shall leave the site of work in a neat and orderly condition equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the owner.

16523.6 FIELD QUALITY CONTROL

A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA RP-6-01, Appendix B.

B. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, and maximum kilowatt consumptions are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be liable to any or all of the following:

1. Manufacturer shall at his expense provide and install any necessary additional fixtures to meet the minimum lighting standards. The Manufacturer shall also either replace the existing poles to meet the new wind load (EPA) requirements or verify by certification by a licensed structural engineer that the existing poles will withstand the additional wind load.

2. Manufacturer shall minimize the Owner's additional long term fixture maintenance and energy consumption costs created by the additional fixtures by reimbursing the Owner the amount of $1,000.00 (one thousand dollars) for each additional fixture required.

3. Manufacturer shall remove the entire unacceptable lighting system and install a new lighting system to meet the specifications.

SUBMITTAL CHECKLIST

Design Submittal Data Checklist and Certification

All items listed below are mandatory, shall comply with the specification, and be submitted 10 days prior to bid.

Tab	Item	Description
A	Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
B	Equipment Layout	Drawing(s) showing field layouts with pole locations.
C	On Field Lighting Design	Lighting design drawing(s) showing: a. Field Name, date, file number, prepared by, and other pertinent data b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y). Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, as well as luminaire information including wattage, lumens and optics d. Height of light level test meter above field surface e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance and uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor. f. Alternate manufacturers shall provide both initial and maintained light scans using a maximum 0.70 Light Loss Factor to calculate maintained values.
D	Off Field Lighting Design	Lighting design drawing showing initial horizontal spill light levels along the boundary line (defined on bid drawings) in footcandles. Horizontal levels shall be at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank lights.
E	Life Cycle Cost Calculation	Document life cycle cost calculations as defined in the specification. Identify energy costs for operating the luminaires, maintenance cost for the system including spot lamp replacement, and group relamping costs. All costs should be based on 25 years.
F	Luminaire Aiming Summary	Document showing each luminaire's aiming angle and the poles on which the luminaries are mounted. Each aiming point shall identify the type of luminaire.
G	Structural Information	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of Michigan.
H	Control & Monitoring System	Manufacturer shall provide written description of proposed monitoring system.
I	Electrical Distribution Plans	If bidding an alternate system, manufacturer must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing (as applicable), signed by a licensed Electrical Engineer in the state of Michigan.
J	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed per specification for 25 years.
K	Warranty	Provide written warranty information including all terms and conditions.
L	Project References	Manufacturer to provide a list of project references of similar projects completed within the past three years.
M	Product Information	Complete set of product brochures for all components, including a complete parts list, UL Listings, and Manufacturers Certificate of Corrosion Protection.
N	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
O	Non-Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.

Manufacturer: _____ **Signature:** _____

Contact Name: _____ **Date:** _____/_____/_____

SECTION 16600
WIRING METHODS

16601 PART 1 - GENERAL

16601.1 Section Includes

A. Wiring Methods.
B. Grounding.

16602 PART 2 - PRODUCTS

(Not Applicable)

16603 PART 3 - EXECUTION

16603.1 General

A. Wiring shall be installed in threaded rigid galvanized steel or steel electrical metal tubing as indicated on the Drawings or noted in this Specification. Conduit routed underfloor may be installed in PVC-40 conduit. Conduit and outlet installation shall be concealed or exposed in various areas as indicated on the Drawings. Exposed conduit shall be run in neat symmetrical lines parallel with the building walls. All conduit in poured concrete shall be PVC schedule 40, 3/4" minimum. The maximum EMT size shall be 2".
B. Conduit and pull boxes shall be installed mechanically secure to permit the pulling in or pulling out of cable proposed for same. Double locknut and bushings shall be used for termination of conduit at boxes and equipment. All joints of conduits shall be tight, low resistance connections.
C. A #6 pullcord shall be provided for all new empty conduits. The pullcord shall be wax impregnated, nylon or other synthetic material that is resistant to moisture and mildew so as to prevent deterioration.
D. Conduit bends shall be held to as large a radius as possible for ease in pulling of conductors and to provide a neatly installed appearance. Generally, conduits 1" and smaller shall be bent in the field. All other conduit bends shall conform to the following: 2" and 2 1/2" conduit, 24" radius; 3" conduit 36" radius; 4" and larger with a minimum of 48". Except where conduit runs are shown in exact detail, runs shall be a maximum of 100 feet between pull boxes with 25 feet deducted for each 90 degree bend and 10 feet deducted for each 45 degree bend, and a reduction in length for all other angle bends to be figured on a similar basis.
E. Pipe straps used in exposed work shall be one hole malleable iron galvanized. The use of perforated strap or wire will not be permitted. Groups of conduit shall be supported in trapeze hangers, Unistrut, Kindorf, Powerstrut or approved equivalent. Individual conduit not supported on pipe straps shall be provided with clevis type hangers. Hanger supports shall be rod or pipe with threaded connections. All exposed conduit shall be supported at least every 8 feet if smaller than 2", and every 10 feet if 2 " and larger unless noted otherwise on the Drawings.

F. Beam clamps for the support of conduit shall be malleable iron or wrought steel with hook rods to grip the beam flange. C-clamps shall not be used.
G. The final connection at all motors shall be made with a minimum of 12" of liquid-tight flexible conduit**.**
H. Holes through walls or partitions required for electrical work shall be neatly cut to size. Penetrations of fire rated assemblies shall be firestopped by approved methods and materials.
I. Conduit runs parallel to or crossing uninsulated hot water or steam pipes shall be separated from same by 12" if parallel, or 7" if crossing. Where hot water or steam pipe lines are insulated, conduit shall clear the insulation surface by 2". Conduit shall not run directly under cold water lines**.**
J. Wire size #6 and larger shall be continuously lubricated at the pull-in point of conduit systems with an approved compound (Y-ER-ESE).
K. No wire smaller than No. 12 AWG shall be used except when specifically noted otherwise on the Drawings.
L. Inserts and anchors necessary for the support of electrical equipment shall be furnished under this section of the Specifications.
M. In general, all motors are furnished and installed in other sections of the Specifications. All starters, safety switches, pushbuttons, selector switches and devices, including all power and control wiring shall be installed under this specification except for package units.
N. Wiring devices such as light switches, duplex receptacles, clock outlets, thermostats, etc., shall be coordinated with other trades to allow for installation in finished wall panels.
O. Outlet boxes in the same wall but serving different rooms shall be at least 4" apart to minimize noise transmission.
P. Control conduit wire shall be identified at each termination point by a white cotton cloth material wire marker, similar to Bradey wire markers.

16603.2 Grounding

A. Electrical system grounding and grounding of non-current carrying metal parts of electrical equipment shall in all instances conform to the minimum requirements of the National Electrical Code with additional grounding as shown on the Drawings and as specified hereinafter:
B. The minimum size conductor to be used for electrical system grounding in any case shall be a No. 6, except as noted on the Drawings. Where conduit is used for mechanical protection of a grounding conductor, the conductor shall be securely bonded to the conduit at each end.
C. Ground resistance in all cases shall be limited to 3 ohms or less for driven ground rod installations comprising a complete system with additional ground rods to be driven if required to effect same. Maximum ground rod resistance to earth for any individual rod installation shall be 25 ohms. If the resistance is found to be higher than 25 ohms, additional rods shall be driven or the length of the rod shall be increased. Separation between adjacent ground rods shall not be less than the length of the rod used.

D. The enclosures of all heavy duty equipment shall be grounded with a separate grounding conductor connected to the nearest ground conductor comprising a part of the electrical system ground. All metal non-current carrying parts of

electrical equipment, raceways, including those completely or partially imbedded in concrete floor slabs shall be grounded to meet the latest NEC requirements.

E. Equipment grounding conductors shall be identified with a green color code, neutral with a white color code.

END OF SECTION

SECTION 16620
ACCESS CONTROL SYSTEM

13801 PART 1 - GENERAL

13801.1 Scope

A. The school currently has Keri Access Systems in place at both Lincoln Elementary and High School/Middle School. New work includes:

1) Adding additional access control to several doors as shown on the Technology/Security Floor Plans.

2) Provide software upgrades to the existing control panels. The current version of software is 4.55.

13801.2 Warranties

A. Provide manufacturer's written warranty.

13801.3 Submittals

A. Provide Data: Submit manufacturer's product information, specifications and installation instructions.

13802 PART 2 - PRODUCTS

13802.1 Current System

A. The current system is a PXL-500/PXL510 Tiger controller.

B. Add new control panels as necessary.

13803 PART 3 - EXECUTION

13803.1 General Requirements

A. Deliver, store and install all products in strict accordance with Manufacturer's written specifications and Referenced Standards.

B. The installation shall be a complete, operational turn-key system, including all components, accessories, wiring, etc.

1) Note that both buildings call for the building receptionist to have the ability to open and lockdown the visitor's entrance door(s) with push button control.

END OF SECTION

SECTION 16720
FIRE ALARM SYSTEM

16721 PART 1 GENERAL

16721.2 DESCRIPTION OF WORK

A. The High School/Middle School has an existing Simplex fire alarm system.
   1. Scope of work includes connecting the new rolling counter grilles being installed in the Administrative Office (Room 102) to the fire alarm system, along with any required accessory for a complete functioning system.

B. Obtain fire marshal approval of the system design and installation. Contractor is responsible for all fees and resolving plan review comments.

16723 PART 3 EXECUTION

16723.1 SYSTEM TEST AND GUARANTEE

A. The manufacturer's agent will perform a quality inspection and test of the final installation in the presence of the installing contractor, Owner's construction representative, and local fire marshal. A certification of the system, verifying performance shall be given to the fire marshal with copies to the Owner.

B. The entire fire alarm system shall be guaranteed free of defects in materials and workmanship for a period of one year after final acceptance by the owner.

END OF SECTION

SECTION 16730

WIRELESS MASTER CLOCKS

16731 Part 1 General Requirements and Scope

Furnish and install a complete new XR wireless clock system using Primex Wireless Inc. XR wireless system, or approved substitutes.

A. Lincoln Elementary School to receive an ES1 watt transmitter system.
B. High School/Middle School to receive a 1 watt transmitter external antenna system.

16731.1 Section Includes

Transmission Systems
GPS Receiver
Primary Transmitter
Clocks
Analog – 12.5" Battery
Analog – 12.5" 120 Volt

16731.2 Related Sections

Division 16 – Electrical (120 volt grounded outlet required for transmitter).

16731.3 References

This Technical Specification and Associated Drawings
Primex Wireless XR Satellite Time System User Manual.

16731.4 Definitions

GPS: Global Positioning System, a worldwide system that employs 24 satellites in an integrated network to determine geographic location anywhere in the world, and which employs and transmits Universal Coordinated Time, the world's most accurate and reliable time.
UTC: Universal Coordinated Time

16731.5 System Description

The system shall provide wireless time from a GPS master time source. The master time will be synchronized to UTC. Hard wiring will not be required to the clocks installed for the system. Clocks shall automatically adjust for Daylight Saving Time in locations where DST is observed.

Analog Clocks shall be synchronized to within 10 milliseconds 6 times per day, and The system shall have an internal oscillator that maintains plus or minus one second per day between synchronizations, so that clock accuracy shall not exceed plus or minus 0.2 seconds.

The system shall include an internal clock reference so that failure to detect the master time source shall not result in the clocks failing to indicate time. Additionally, XR transmitters will have an internal battery backup of up to eight hours in the event of a power failure so that settings and the correct master time will be instantly recalled upon restoration of power.

The system shall incorporate a "fail-safe" design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.

Clock locations shall be as indicated on the drawings, and clocks shall be fully portable, capable of being relocated at any time.

The system must operate in accordance with a "Radio Station Authorization", Form FCC 601 – LM, granted by the Federal Communications Commission (FCC). This license will be issued to and held by the end user

16731.6 Regulatory Requirements

Equipment and components furnished shall be of manufacturer's latest model.

The end user will hold a license, known as a "Radio Station Authorization" granted by the FCC.

This license grants the end user protected use for wireless transmission at the designated frequency.

This license will designate a unique "call sign" for each end user.

Transmitter and receiver shall comply with Part 90 of FCC rules as follows:

This device may not cause harmful interference, and

This device must accept interference received, including interference that may cause undesired operation.

Transmitter frequency shall be governed by FCC Part 90.35.

Transmitter output power shall be governed by FCC Part 90 257 (b)

System shall be installed in compliance with local and state authorities having jurisdiction.

16731.7 Submittals

Product Data: Submit complete catalog data for each component, describing physical characteristics and method of installation. Submit brochure showing available colors and finishes of clocks.

Manufacturer's Instructions: Submit complete installation, set-up and maintenance instructions.

16731.8 Substitutions

Proposed substitutions, to be considered, shall be manufactured of equivalent materials that meet or exceed specified requirements of this Section.

Proposed substitutions shall be identified not less than 10 days prior to bid date.

Other systems requiring wiring and/or conduit between master and clocks will not be accepted.

Other systems using wireless technology in an unlicensed frequency range or a frequency outside of 72 MHz will not be accepted.

Other systems using wireless technology where the license is held by any party other than the end user will not be accepted.

16731.9 Quality Assurance

Permits: Obtain operating license for the transmitter from the FCC.

Qualifications:

Manufacturer: Company specializing in manufacturing commercial time system products with a minimum of 35 continuous years of documented experience including 10 years experience producing GPS wireless time systems.

Installer: Company with documented experience in the installation of commercial time systems.

16731.10 Delivery Storage and Handling

Deliver all components to the site in the manufacturer's original packaging. Packaging shall contain manufacturer's name and address, product identification number, and other related information.

Store equipment in finished building, unopened containers until ready for installation.

16731.11 Project Site Conditions

Clocks shall not be installed until painting and other finish work in each room is complete.

Coordinate installation of system antenna for access to the roof to comply with safety standards detailed in manufacturers instructions.

GPS package: coordinate installation of GPS receiver for access to the roof or exterior sidewall so that the bracket and related fasteners are watertight.

16731.12 System Startup

At completion of installation and prior to final acceptance, turn on the equipment; ensure that all equipment is operating properly, and that all clocks are functioning.

16731.13 Warranty

Manufacturer will provide a warranty on GPS receiver, transmitter, and antenna. All components will have a 3 year warranty.

16732 Part 2 – Products

16732.1 Manufacturer

XR wireless clock system shall be manufactured by Primex Wireless, Inc., 965 Wells Street, Lake Geneva WI 53147 (800) 537-0464 FAX (262) 248-0061 www.primexwireless.com.

16732.2 Sequence of Operation

Transmitter Operation

When power is first applied to the transmitter, it checks for and displays the software version. It then checks the position of the switches and stores their position in memory. The transmitter looks for the master time source.

GPS Time Source

With the XR transmitter in GPS mode, it powers a connected GPS engine mounted with a clear view of the sky. Upon power, the GPS module seeks the GPS satellites in orbit to determine position and UTC time. Once the transmitter acknowledges receivable GPS data, it downloads time data and synchronizes its internal master clock to GPS time. The transmitter then starts to transmit its internal time once every second. The transmitter updates its internal clock every time it receives valid time data from the GPS.

Analog Clock Operation

Apply power or insert batteries. Follow set up procedures detailed in manufacturer's instructions.

After initial setup, the clock will shut off the receiver. Six times each day, the microprocessor will activate the receiver and starting with the stored channel, it will again look for a valid time signal. If necessary, the clocks will resynchronize to the correct time.

If the clock has not decoded a valid time signal for a pre-determined number of days, it will go to a step mode. Non signal reception can be caused by low battery voltage. If this occurs, replace the batteries.

16732.3 Equipment

General: The clock system shall include a transmitter, a roof or window mounted GPS receiver, indicating clocks, and all accessories for complete operation.

GPS Receiver

GPS roof mounted, with 16-foot cable (5m) attached
Primex Wireless extension cable available: 50ft (15.25m), 100 ft (30.5m), and 200 ft (61m) as needed by contractor

The GPS Receiver shall be a complete GPS receiver including antenna in a waterproof case, designed for roof or outdoor mounting. Provide mounting bracket for attachment to roof structure.

a) For Lincoln Elementary, the GPS receiver is going on the exterior wall of the "centrally located rooftop penthouse", and the 1W internal transmitter is in a tech closet nearby (Reference drawing 100-E3.1)
b) For the HS/MS, the external antennae is going up on the roof (ANT-NP1 base mounted) of the HS gym, and the 1 watt external transmitter is in the mechanical room tech closet by the gym (Reference drawing 200-E3.1)

The GPS Receiver cable must be plenum rated where required by local code.

Transmitter

Lincoln E/S - Primex Wireless Model **XR01IM**, consisting of wireless transmitter with Ethernet port for NTP time input and GPS receiver for GPS satellite time input. Unit shall obtain current atomic time from either satellite via GPS or via NTP through the Ethernet port.

Hudson MS/HS - Primex Wireless Model **XR01EM**, consisting of wireless transmitter with Ethernet port for NTP time input and GPS receiver for GPS satellite time input. Unit shall obtain current atomic time from either satellite via GPS or via NTP through the Ethernet port.

Transmission:

Frequency Ranges: 72.020 to 72.980 MHz, 74.610 to 74.790 MHz, 75.210 to 75.390 MHz, 75.440 to 75.600 MHz. Each range is reserved by the FCC for licensed fixed mobile broadcasts.

Transmission Power: 1 watt (30dBm) maximum

Radio technology: narrowband FM

Number of channels: 74

Channel bandwidth: 20 kHz maximum

Transition mode: one-way communication

Data rate: 2 KBps

Operating range: 32 degree F to 158 degrees F (0 degrees C. to 70 degrees C).

Transmitter:

Transmitter output power: +26 to +30 dBm

Frequency deviation: +/- 4 kHz

Transmitter power requirements: 120 VAC 60 Hz

Internal power requirements: 5 VDC

Carrier frequency stability: +/- 20 ppm

Transmitter shall have 74 selectable channels to assure interference-free reception.

Transmitter shall have the following switches:
Time zone adjustment switches for all time zones in the world. Includes: Eastern, Central, Mountain, Pacific, Alaska, and Hawaii.

DIP Switch to allow the following configuration: Daylight Saving Time bypass option, 12-hour or 24-hour display, GPS or NTP time source, Local or LAN configuration, UTC+ or UTC-, 30 minute UTC offset option.

The DIP switches and channel switches are disabled during production by the manufacturer as the broadcast channel number and time zone are to be predetermined during the FCC licensing process based on end user location and existing wireless services operating in the area. The end user will be required to contact Primex

Wireless if, for any reason, a different broadcast channel is required, since the request would require a modification of the license, requiring approval by the FCC, or if a different time source is desired.

Transmitter housing shall be black metal case, 16-3/4 inches (424.4mm) by 12 inches (304.8mm) by 1-7/8 inches (46.4mm) in size.

An external antenna is included with the transmitter model number XR01EM for the M/S-H/S. The antenna connects to the transmitter via a 50-ohm 100ft. coaxial cable.

Transmitter housing shall incorporate a display, which shall include the following:

Time readout

AM and PM indicator if 12-hour time display is set

Day and date readout

Time zone indicator including Standard or Daylight Savings Time

On screen menu to verify diagnostics, errors, time updates, and switch settings, toggled by sequence of push buttons next to display

Status LEDs: Green to determine broadcast mode, yellow which flashes in the event of lack of time update after 48 hours, red which flashes to indicate connection or internal transmitter problem. The green broadcast mode LED will be solid to indicate the transmitter is broadcasting its signal, and dark to indicate the transmitter is in standby mode and not broadcasting.

Internal clock:
Transmitter shall contain an internal clock such that failure to update time from source will not disable the operation of the clocks.

Power supply (included)
Input: 120 volt AC 50/60 Hz, 0.4 amps.
Output: 9 volt DC, 2.0 amps.

Antenna: An external antenna is included with the transmitter model number.
The antenna connects to the transmitter via a 100 ft. (30.5m) 50-ohm coaxial cable,
Antenna: Dimensions: radiating element 29.4 inches (747mm)

Ground radials 41.5 inches (1063 mm)

Equivalent flat plate area: 0.68ft2 (0.063m2)

Polarization: Vertical

H-plane beamwidth: omni

E-plane beamwidth: 78 degrees (half power)

Max. Input power (75 watts@ 50 degrees)

Gain: 0 dBd
VSWR (max)<: 1.5

Frequency range: 68-78MHz (broadband)

Impedance: 50 ohms
Lightning Protection: Direct Ground
Connector N female

Pole or Wall Mountable
Mounting hardware supplied

Building -mount antenna mast kit. Primex Wireless Model
ANT – P1

Wind survival rating 120mph (200kph)
Additional Equipment

Traditional analog clocks (battery): Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black. 12-1/2 inch (317.5mm) diameter analog clock: Primex Wireless Model **14155**
16 inch (406.4mm) diameter analog clock: Primex Wireless Model **14163**

Analog clocks-battery operated, and shall have minimum 5-year battery life.

Analog clocks shall be capable of automatically adjusting for Daylight Saving Time. An on-off switch located on the transmitter shall disable this function if desired.

Time shall be automatically updated from the transmitter 6 times per day.

Analog clocks shall remember the time during changing of batteries.

Installer will furnish clock batteries in accordance with manufacturer's instructions 12.5inch/317.5mm and 16 inch/406.4mm –2 D cell Alkalines

Analog clock receivers shall be as follows:

Receiver sensitivity: >-110 dBm

Receiver power: battery pack, supplied by manufacturer.

Antenna type: internal

Antenna gain: -7 dBd

If the transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 96 hours,

The second hand will "five -step" as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.

Traditional analog clocks (120 AC): Analog clocks shall be wall mounted. Clocks shall have polycarbonate frame and polycarbonate lens. Face shall be white. Hour and minute hands shall be black.

12-1/2 inch (317.5mm) diameter analog clock, 120 VAC, Primex Wireless Model **14306**
16 inch (406.4mm) diameter analog clock: 120 VAC, Primex Wireless Model **14339**

Analog clocks shall be AC powered (120 VAC) as indicated on the Prints. Clocks must have an 18 inch (457.2mm) cord with two-prong plug (120 VAC) or pigtailed to connect to power source.

Analog clocks shall be capable of adjusting for Daylight Saving Time.

Time shall be automatically be updated from the transmitter 6 times per day.

If power is interrupted, the clock will stop until power resumes. Upon resumption of power, the clock will self correct to the current time.

Clocks shall have a tamper proof/theft resistant clock lock mounting slots.

Analog clock receivers shall be as follows:

Receiver sensitivity: >-110 dBm

Receiver power: 24 VAC or 120 VAC (see model #)

Antenna type: internal

Antenna gain: -7 dBd

If transmitter stops transmitting valid time signals due to power failure, the clocks will continue to function as accurate quartz clocks until a valid time signal is decoded. If signal transmission is not restored after 96 hours, the second hand will "five step" as a visual indicator that the signal has been lost. Should the clocks lose power and signal, the clocks will not function.
Wire guards: Provide one for each clock as follows:

Analog clock wire guard Primex Wireless Model **14123**, 18 by 18 inch (457.2 by 457.2mm) size, for 16 inch (406.4mm) diameter analog clocks.

Transmitter Rack.
Primex Wireless Model **14005**, 3" (76.2mm) x 16.5" (419mm)(x 18"(457mm), 18 gauge metal, epoxy covered

16733 Part 3 – Execution

16733.1 Examination

Verify that construction is complete in spaces to receive equipment and that rooms are clean and dry.

Verify that 120 volt electrical outlet is located within 6 feet (1.83m) of location of transmitter and the outlet is operational and properly grounded.

16733.2 Installation

GPS Unit: Install on roof in location indicated, in clear view of the sky. Install unit in location free from standing water, and above accumulations of leaves or debris. Seal cable connection to GPS with cable connection sealant and keep cable connections inside building. Cable connections must be protected from outside elements.

Locate transmitter in a penthouse, electrical closet, or telecommunications room in a central location in the building. Clearance around all sides of the transmitter to comply with local building codes.

MS/HS XR01EM Transmitter is connected to external antenna via a 50 ohm coaxial cable. Typical length – 100ft (30.5m) Cable routing should comply with ANSI EIA/TIA-569 and local building codes. If the cable is routed through conduit, the conduit should be a minimum of 2 inch (50.8mm) diameter.

Transmitter enclosure must be bonded to an earth ground per ANSI EIA/TIA 607, NEC Article 250, and local building codes

If GPS Unit will be used as master time source
Attach GPS receiver to transmitter using cable. Set GPS/LAN DIP switch to GPS.

Antenna
Antenna should be mounted to a mast on the roof of the building connecting to the transmitter via a 50-ohm coaxial cable. Consult manufacturer's instruction manual for specific clearances and mounting instructions.Antenna must be bonded to an earth ground per ANSI EIA/TIA 607, NEC Article 250, and local building codes.

Analog clocks (battery): Perform the following operations with each clock:

Install batteries.

Set clocks to correct time in accordance with manufacturer's instructions.

Observe analog clock until valid signals are received and analog clock adjusts itself to correct time.
Install the analog clock on the wall in the indicated location, plumb, level and tight against the wall. If using 12-1/2 inch (317.5mm) clock, attach using clock-lock hanging method and suitable fasteners as approved by clock manufacturer.

Analog clocks (AC): Perform the following operations with each clock:

Apply power (120 VAC)
Observe clock until valid time signals are received and analog clock adjusts itself to correct time.

Install the analog clock on the wall in the indicated location, plumb, level, and tight against the wall. Attach using clock-lock hanging method and suitable fasteners as approved by clock manufacturer.
Wire guards: Secure to wall, using approved theft-resistant fasteners.

16733.3 Adjusting

Prior to final acceptance, inspect each clock, adjust as required, and replace parts which are found defective.

16733.4 Cleaning

Prior to final acceptance, clean exposed surfaces of clocks, using cleaning methods recommended by clock manufacturer. Remove temporary labels from clock faces. Do not remove labels from backs of clocks.

16733.5 Demonstration

Provide training to Owner's representative on setting and adjusting clocks, replacing batteries and routine maintenance.

16733.6 Protection

Protect finished installation until final acceptance of the project.

16733.7 Testing

All devices must be tested at their operational location under normal operational conditions to assure reception of signal.

END OF SECTION

2012 ARCHITECTURAL & ELECTRICAL RENOVATIONS
HUDSON AREA SCHOOLS

SECTION 16740
INTERCOM SYSTEM

16721 PART 1 GENERAL

16721.1 SYSTEM OVERVIEW

A. The High School/Middle School existing intercom system requires the following modifications:

1. Replace the existing control panel with a new standard 75 Station Bogen (or approved equal) school control panel.

2. Add new intercom speakers as shown on Drawing 200 E3.1.

3. Restore function to the “cafeteria events” public address component.

16721.2 SUBMITTALS

A. Shop Drawings:
   1. Prepare and submit shop drawings of all new/replacement components for Engineers approval.

16723 PART 3 EXECUTION

16723.1 INSTALLATION

A. All components shall be installed per manufacturer’s requirements and as indicated on the drawings.

16723.2 SYSTEM TEST AND GUARANTEE

A. The entire intercom system shall be fully functional. New components shall be guaranteed free of defects in materials and workmanship for a period of one year after final acceptance by the owner.

END OF SECTION

SECTION 16950
OCCUPANCY SENSORS

16951 PART 1. GENERAL

16951.1 WORK INCLUDED

A. Contractor's work to include all labor, materials, tools, appliances, control hardware, sensor, wire, junction boxes and equipment necessary for and incidental to the delivery, installation and furnishing of a completely operational occupancy sensor lighting control system, as described herein.

B. Contractor/Supplier shall examine all general specification provisions and drawings for related electrical work required as work under Division 16.

C. Contractor shall coordinate all work described in this section with all other applicable plans and specifications, including but not limited to wiring, conduit, fixtures, HVAC systems and building management systems.

16951.2 EQUIPMENT QUALIFICATION

A. Products supplied shall be from a single manufacturer that has been continuously involved in manufacturing of occupancy sensors for a minimum of five (5) years. Mixing of manufacturers shall not be allowed.

B. All components shall be U.L. listed, offer a five (5) year warranty and meet all state and local applicable code requirements.

C. Products shall be manufactured by an ISO 9002 certified manufacturing facility and shall have a defect rate of less than 1/3 of 1%.

D. Wall switch products must be capable of withstanding the effects of inrush current. Submittals shall clearly indicate the method used.

16951.3 SYSTEM DESCRIPTION

A. The objective of this section is to ensure the proper installation of the occupancy sensor based lighting control system so that lighting is turned off automatically after reasonable time delay when a room or area is vacated by the last person to occupy said room or area.

B. The occupancy sensor based lighting control shall accommodate all conditions of space utilization and all irregular work hours and habits.

C. Contractor shall warrant all equipment furnished in accordance to this specification to be undamaged, free of defects in materials and workmanship, and in conformance with specifications. The supplier’s obligation shall include repair or replacement, and testing without charge to the owner, all or any parts of equipment which are found to be damaged, defective or non-conforming and returned to the supplier. The warranty shall commence upon the owner's acceptance of the project. Warranty on labor shall be for a minimum period of one (1) year.

16951.4 SUBMITTALS

A. Manufacturer shall substantiate conformance to this specification by supplying the necessary documents, performance data and wiring diagrams. Any deviations to this specification must be clearly stated by letter and submitted.

B. Submit a lighting plan clearly marked by manufacturer showing proper product, location and orientation of each sensor.

C. Submit any interconnection diagrams per major subsystem showing proper wiring.

D. Submit standard catalog literature which includes performance specifications indicating compliance to the specification.

E. Catalog sheets must clearly state any load restrictions when used with electronic ballasts.

16951.5 SYSTEM OPERATION

A. It shall be the contractor's responsibility to make all proper adjustments to assure owner's satisfaction with the occupancy system, or;

B. Factory Startup (Optional): It shall be the manufacturer's responsibility to verify all proper adjustments and train owner's personnel to ensure owner's satisfaction with the occupancy system. This service is provided at an additional cost.

16952 PART 2. SPECIFIC REQUIREMENTS

16952.1 ACCEPTABLE MANUFACTURERS

A. Watt Stopper or Pre-approved equal: For pre-approval, provide all the information listed under section 1.04A and 1.04D a minimum of ten (10) working days prior to initial bid date.

B. The listing of any manufacturer as "acceptable" does not imply automatic approval. It is the sole responsibility of the electrical contractor to ensure that any price quotations received and submittals made are for sensors which meet or exceed the specifications included herein.

16952.2 PRODUCTS

A. All products shall be Watt Stopper product numbers:

1. Ceiling sensors: WT-605, WT-1100, WT-2255, DT-200, CI-300
2. Wall switch sensors: PW-103N, DW-103
3. Power and Auxiliary Packs: BZ-50

B. Wall switch sensors shall be capable of detection of occupancy at desktop level up to 300 square feet, and gross motion up to 1000 square feet.

C. Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts and shall have 180˚ coverage capability.

D. Where specified, wall switch sensors shall provide a field selectable option to convert sensor operation from manual-ON to automatic-ON.

G. Passive infrared sensors shall utilize Pulse Count Processing and Detection Signature Processing to respond only to those signals caused by human motion.

I. Passive infrared sensors shall provide high immunity to false triggering from RFI (hand-held radios) and EMI (electrical noise on the line).

J. Passive infrared sensors shall have a multiple segmented Fresnel lens, in a multiple-tier configuration, with grooves-in to eliminate dust and residue build-up.

K. Dual technology sensors shall be wall mounted, corner mounted or ceiling mounted in such a way as to minimize coverage in unwanted areas.

M. Dual technology sensors shall consist of passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound shall not be considered.

N Ultrasonic sensors shall utilize Advanced Signal Processing to adjust the detection threshold dynamically to compensate for constantly changing levels of activity and air flow throughout controlled space.

O. Ultrasonic operating frequency shall be crystal controlled at 25 kHz within ± 0.005% tolerance, 32 kHz within ± 0.002% tolerance, or 40 kHz ± 0.002% tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are not acceptable.

P. All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.

Q. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.

R. Time delays options shall be for a fixed duration, not to exceed 30 minutes.

S. All sensors shall have readily accessible, user adjustable settings for time delay and sensitivity. Settings shall be located on the sensor (not the control unit) and shall be recessed to limit tampering.

T. In the event of failure, a bypass manual override shall be provided on each sensor. When bypass is utilized, lighting shall remain on constantly or control shall divert to a wall switch until sensor is replaced. This control shall be recessed to prevent tampering.

U. All sensors shall provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.

16952.3 CIRCUIT CONTROL HARDWARE - CU

A. Control Units - For ease of mounting, installation and future service, control unit(s) shall be able to externally mount through a 1/2" knock-out on a standard electrical enclosure and be an integrated, self-contained unit consisting internally of an isolated load switching control relay and a transformer to provide low-voltage power. Control unit shall provide power to a minimum of two (2) sensors.

B. Control wiring between sensors and controls units shall be Class II , 18-24 AWG, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable.

16953 PART 3. EXECUTION

16953.1 INSTALLATION

A. It shall be the contractor's responsibility to locate and aim sensors in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have ninety (90) to one hundred (100) percent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.

B. It is the contractor’s responsibility to arrange a pre-installation meeting with manufacturer's factory authorized representative, at owner's facility, to verify placement of sensors and installation criteria.

C. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components. The contractor shall also provide, at the owner's facility, the training necessary to familiarize the owner's personnel with the operation, use, adjustment, and problem solving diagnosis of the occupancy sensing devices and systems.