Integrated Design Solutions

architecture engineering interiors & technology

Project Manual

Troy School District
Lighting Replacement
Athens High School,
Boulan Park Middle School and
Larson Middle School
TSD Bid No. 9670

IDS Project No. 10100-1001

April 20, 2010
Bids

Project Manual

Troy School District
Lighting Replacement
Athens High School,
Boulan Park Middle School and
Larson Middle School
TSD Bid No. 9670

For The

Troy School District
4400 Livernois
Troy, Michigan 48098

Integrated Design Solutions LLC
Architecture, Engineering, Interiors & Technology
1441 W. Long Lake, Suite 200
Troy, Michigan 48098
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www.ids-troy.com

IDS Project No. 10100-1001

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SECTION 00100 - ADVERTISEMENT FOR BIDS

DATE: April 20, 2010

PROJECT: Troy School District
Lighting Replacement
Athens High School,
Boulan Park Middle School and
Larson Middle School
TSD Bid No. 9670
Troy, Michigan

OWNER: Troy School District
4400 Livernois
Troy, Michigan 48098

ENGINEERING/ TECHNOLOGY DESIGNER: Integrated Design Solutions, LLC
Architecture, Engineering, Interiors & Technology
1441 W. Long Lake, Suite 200
Troy, MI 48098
(248) 823-2100
(248) 823-2200 fax

BIDS RECEIVED: Until 3:00 pm local time on May 5, 2010, the Owner will receive sealed Bids for the work as set forth in the Bidding Documents at:

Troy School District
Purchasing Department
1140 Rankin
Troy, Michigan 48083

ATTN: Frank Lams
Purchasing Supervisor

All bids will be publicly opened and read aloud at 3:01 pm, May 5, 2010. A bid tabulation summary will be available.

The Bidding Documents will be on file on and after April 20, 2010, and may be examined at the following locations during regular business hours, Monday through Friday.

World Wide Web: Troy School District
Specifications Only: http://www.troy.k12.mi.us/purchasing/items_out_for_bid.htm

The offices of: Integrated Design Solutions, LLC, 1441 W. Long Lake, Suite 200, Troy, MI 48098, (248) 823-2100
Construction Association of Michigan, 43636 Woodward Ave., Bloomfield Hills, MI 48302, (248) 972-1000
McGraw Hill Construction, 20475 Woodingham Dr., Detroit, MI 48221, (313) 342-6449

The Architect will furnish one (1) set of documents to the bidders at a $50 refundable deposit.

A recommended pre-bid conference is scheduled for April 28, 2010, at 2:30 p.m. local time. All Bidders are responsible for attendance at the pre-bid conference. Bidders shall meet in the Main Office at Troy School District Athens High School, 4333 John R, Troy, Michigan 48098.

Immediately following the pre-bid conference, the Owner will make available the school buildings for Bidders to examine sites and local conditions.

Each Bid shall be accompanied by a Bid Security in the form of a certified check, cashier's check, money order or bid bond made payable to Troy School District in an amount not less than five percent (5%) of the base bid as a Bid guarantee.

The successful Bidder shall provide a Performance Bond and a Labor and Material Payment Bond covering the faithful performance of the Contract and payment of all obligations arising thereunder, each in the amount of one hundred percent (100%) of the contract amount. The cost of such bonds shall be included in the Bid.

The bid security of Bidders under consideration will be returned immediately after execution of the Contract by the Owner. The amount of the bid security shall be forfeited to the Owner if the successful Bidder fails to enter into a contract and furnish required bonds and insurance certificates within ten (10) days after award of Contract.

Withdrawal of any Bid is prohibited for a period of sixty (60) days after the actual date of the opening thereof.

Each Bidder agrees to waive any claim it has or may have with the Owner, the Engineering Consultant, and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

The Owner reserves the right to reject any or all Bids, either in whole or in part, to reject a Bid not accompanied by the required bid security or by other data required by the Bidding Documents or to reject a Bid which is any way incomplete or irregular and to waive informality and irregularity in the bids and in the bidding.

The Owner reserves the right to accept Alternates in any order or combination and to determine the low Bidder on the basis of the sum of the base bid and the Alternates accepted.

END OF ADVERTISEMENT FOR BIDS

SECTION 00200 - INSTRUCTIONS TO BIDDERS

1. DEFINITIONS

A. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement for Bids, Instruction to Bidders, the Bid Form and other bidding and contract forms. The proposed Contract Documents consist of the form of an Agreement between Owner and Contractor, General and Supplementary Conditions of the Contract, Specifications, Drawings and Addenda issued prior to execution of the Contract.

B. Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract, which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

C. A Bidder is a person or entity who submits a Bid.

D. A Bid is a complete and properly signed proposal to do the work for the sums stipulated therein submitted in accordance with the Bidding Documents.

E. The Base Bid is the amount stated in the Bid for which the Bidder offers to perform the work as described in the Bidding Documents as the base, to which work may be added to or deleted from, for the amounts stated in the Alternates.

F. An Alternate is an amount stated in the Bid Form to be added to or deducted from the amount of the Base Bid if the described Alternate is accepted.

G. A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the work as described in the Bidding Documents.

2. SECURING BIDDING DOCUMENTS

A. Bidding is by public advertisement and invitation. Copies of the Bidding Documents may be obtained from Integrated Design Solutions, LLC, upon conditions set forth in the Advertisement for Bids.

B. Only complete sets of Bidding Documents will be furnished. The Owner or Architect assumes no responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.

C. All copies of the Bidding Documents received for bidding purposes shall be returned in usable condition within ten (10) days of receipt of bids. Incomplete bidding documents or bidding documents returned later than ten (10) days after receipt of bids will result in a forfeiture of the Bidder's deposit.

D. Bidding Documents remain the property of the Architect.

3. PREPARATION AND SUBMISSION OF BIDS

A. Bids shall be submitted on forms bound in the Project Manual of the Bidding Documents.

B. All blanks on the Bid Form must be filled in by typewriter or by hand in ink.

C. Amounts shall be expressed in both words and figures. In case of a discrepancy the amount stated in words shall govern.

D. Alterations by erasure or interlineations must be initialed by the Bidder.

E. All Alternates must be bid. If no change in the Base Bid is required, enter "No Change."

F. Submit the Bid, along with the bid security and any other documents required to be submitted with the Bid, to the Owner, and deliver to the address given in the Advertisement for Bids on or before the day and hour set for receipt of the Bids.

1. Enclose each Bid in a sealed opaque envelope bearing the title of the work LIGHTING REPLACEMENT, ATHENS HIGH SCHOOL, BOULAN PARK MIDDLE SCHOOL AND LARSON MIDDLE SCHOOL, TSD Bid No. 9670, the name of the Bidder, and the date and hour of the Bid opening, with the notation "SEALED BID ENCLOSED".
2. Do not change the wording of the Bid Form, and do not add words to, or delete words from the Bid Form.
3. Unauthorized conditions, limitations, or provisions attached to the Bid will be cause for rejection of the Bid.
4. Submit only duplicate signed copies of the Bid. Clearly distinguish the original bid from the duplicated copies of the bid.
5. It is the sole responsibility of the Bidder to see that his bid is received on time.
6. Telephonic, telegraphic, facsimile (fax), or e-mail Bids or telephonic, telegraphic, facsimile (fax) or e-mail modification of a Bid will not be considered.
7. Bids received after the time fixed for receiving them will not be considered and will be returned to the Bidder unopened.
8. Properly identified Bids received on time will be publicly opened and read aloud. A bid tabulation summary will be available.
9. The "FAMILIAL DISCLOSURE STATEMENT" found in the bid form must be completed.

G. The Bidder in submitting a Bid represents that:

1. The Bidder has read and understands the Bidding Documents, including the Drawings, Specifications and other proposed Contract Documents.
2. The Bid is made in compliance with the Bidding Documents.
3. The Bidder has visited the site of the Work and become informed as to existing conditions and limitations under which the Work is to be performed and included in their Bid a sum to cover the cost necessary to perform the Work as set forth in the Bidding Documents. No allowance will be made to a Bidder because of a lack of such examination or knowledge.
4. The Bid is based upon materials, equipment and systems required by the Bidding Documents without exception and without substitutions.

4. FAMILIAL DISCLOSURE STATEMENT

A. Each Bid shall be accompanied by the Familial Disclosure Statement in compliance with MCL.380.1267. The Bid proposal must be accompanied by a sworn and notarized statement disclosing Familial Relationship that exists between the Bidder or any employee of the Bidder and any member of the Board of Education of the School District, or the Superintendent of the School District. The School District will not consider a Bid Proposal that does not include this sworn and notarized Disclosure Statement.

5. BID SECURITY AND BONDS

A. Each bid shall be accompanied by a certified check, cashier's check, money order or bid bond made payable to Troy School District in an amount not less than five percent (5%) of the Base Bid as a proposal guarantee. Bid Bond shall be provided by a company licensed to do business in the State of Michigan.

B. The successful Bidder shall provide a Performance Bond and a Labor and Material Payment Bond, covering the faithful performance of the Contract and payment of all obligations arising there under, each in the amount of one hundred percent (100%) of the contract amount. Bonds shall be provided by a company licensed to do business in the State of Michigan. The cost of such bonds shall be included in the Bid.

C. The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this paragraph.

D. Should the Bidder refuse to enter into a 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.

E. The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either the Contract has been executed and bonds have been furnished or the specified time has elapsed so that the Bid may be withdrawn or all Bids have been rejected.

6. MODIFICATIONS AND WITHDRAWAL OF BIDS

A. A Bidder may not modify, withdraw or cancel a Bid, for a period of sixty (60) days following the time and date designated for receipt of Bids, and by submitting a Bid each Bidder shall so agree.

B. A Bidder may withdraw their Bid, either personally or by written request, at any time prior to the scheduled time for receipt of bids. A withdrawn Bid may be resubmitted up to the date and time designated for receipt of Bids.

C. Prior to the time and date for receipt of Bids, a Bidder may modify a Bid by notice to the party receiving Bids, at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written notice and the signature of the Bidder shall be received, and date and time stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be worded as not to reveal the amount of the original Bid.

7. CONSIDERATION OF BIDS

A. The Owner reserves the right to reject any or all Bids submitted either in whole or part, to reject a bid not accompanied by the required Bid security or by other data required by the Bidding Documents or to reject a Bid which is any way incomplete or irregular and to waive informality and irregularity in the Bids and in the Bidding.

B. The Owner reserves the right to accept alternates in any order or combination and to determine the low Bidder on the basis of the sum of the Base Bid and the alternates accepted and to make the awards that the Owner determines are in its best interest. The decision of the Owner is final and not subject to appeal.

C. The Owner reserves the right to negotiate with any Bidder without rebidding the project in whole or in part.

8. EXECUTION OF AGREEMENT

A. The successful Bidder will be required to execute AIA Abbreviated Standard Form of Agreement between Owner and Contractor, AIA Document A107-2007 in conjunction with the Supplementary Conditions and additional conditions as defined within Specification Section 00800. The contract documents will be available for review and signatures within seven (7) days of contract award. The owner will issue an owner's Purchase Order for the owner's accounting purposes only.

B. The Bidder to whom the Contract is awarded shall, within five (5) calendar days after notice of award and receipt of Agreement forms from the Owner, sign and deliver required copies to the Owner.

C. At or prior to delivery of the signed Agreement, the Bidder to whom the Contract is awarded shall deliver to the Owner those Certificates of Insurance required by the Owner.

D. The Owner shall approve Bonds and Certificates of Insurance and any required state or local permits before the successful Bidder may proceed with the Work. Failure or refusal to provide Bonds or Certificates of Insurance or required permits in a form satisfactory to the Owner shall subject the successful Bidder to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

E. After award of the Contract and prior to the first payment request, the Bidder to whom the Contract is awarded shall deliver to the Owner a schedule of values.

9. INTERPRETATION OF CONTRACT DOCUMENTS PRIOR TO BIDDING

A. Bidders shall study and compare the Bidding Documents with each other, shall examine the site and local conditions by appointment with Owner and if in doubt as to the true meaning of any part of the Bidding Documents, or finds discrepancies, inconsistencies, ambiguities or errors in or omissions from any part of the Bidding Documents, the Bidder may submit to the Architect a written request for interpretation thereof. The person submitting the request shall be responsible for its prompt delivery.

Bids Documents Available:	April 20, 2010
Pre-bid Conference and Site Visit:	April 28, 2010, 2:30 pm
Deadline for RFI Submissions:	April 30, 2010, 12:00 pm
Deadline for RFI Responses and Addenda:	April 30, 2010, 4:00 pm
Bids Due:	May 5, 2010, 3:00 pm
Bid Opening:	May 5, 2010, 3:01 pm
Post Bid Interviews:	May 7, 2010
Bid Award:	May 18, 2010 Board of Education Meeting

B. Interpretation, correction or changes to the proposed Contract Documents will be made only by Addendum. Explanations, interpretations, corrections or changes of the Bidding Documents by any other method will not be binding.

10. ADDENDA/RESPONSES TO RFI'S

A. Addenda and responses to RFI's will be posted on the TSD website and plan houses listed on the Advertisement for Bids.

B. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file.

C. Addenda will be issued no later than four (4) days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which postpones the date for receipt of Bids.

D. Each Bidder shall ascertain prior to submitting his bid that he has received all Addenda issued and shall acknowledge their receipt on the Bid Form.

E. Each Bidder shall be responsible for compliance with all issued Addenda.

11. SUBSTITUTIONS

A. No substitutions will be considered prior to receipt of Bids, unless a written request for approval has been received by the Architect at least ten (10) days prior to the date for receipt of Bids. Such request for substitutions shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, samples and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

B. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum.

C. No substitutions will be considered after Contract award unless specifically provided for in the Contract Documents.

12. TAXES

A. For the purposes of this bid, the Troy School District is tax exempt. Do not include Federal, State or local taxes in the Bid. The Owner's federal and state tax exempt number is B38.600.3099. Usage taxes shall be included in the base bid price.

13. PERMITS AND FEES

A. All Bids shall include costs of all applicable permits and fees.

14. TIME OF COMPLETION

A. The Bidder, if awarded the Contract, agrees to complete the Work on or before the Contract Completion Date stated in the Bid Form.

15. EQUAL OPPORTUNITY

A. The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take steps to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

B. The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf; state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

16. PREVAILING WAGE LAW

A. Prevailing wage rates apply to this project.

B. The wages and fringe benefits to be paid to each class of worker shall not be less than the wage and fringe benefit rates prevailing in the locality in which the work is to be performed, in accordance with Act 166 of the State of Michigan Public Acts of 1965 as amended.

17. POST BID INFORMATION

A. Bidders to whom Contract award is under consideration shall submit to the Engineer, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement.

END OF SECTION 00200

STATE OF MICHIGAN

JENNIFER M. GRANHOLM
GOVERNOR

DEPARTMENT OF ENERGY, LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

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

The Michigan Department of Labor & Economic Growth 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 rates provide 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 certified payrolls, as used in the industry, of each and every construction mechanic, and verification of such certified payroll in writing by either a representative or auditor/certified accountant at the end of such a

certified payroll. These records should include the occupation and indicate the hours worked on each project for each classification and the actual wages and benefits paid. 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 Wage & Hour Division. 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.

A violation of Act 166 may result in the contractor's name being added to the Prevailing Wage Act Violators List published on the division's website, updated monthly. This list includes the names and addresses of contractors and subcontractors the division has found in violation of Act 166 based on complaints from individuals and third parties. The Prevailing Wage Act Violators List is intended to inform contracting agents of contractors that have violated Act 166 for use in determining who should receive state-funded projects.

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.

Revised: 05/23/08

JENNIFER M.
GRANHOLM
GOVERNOR

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Wage & Hour Division
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www.michigan.gov/wagehour

STANLEY "SKIP" PRUSS
DIRECTOR

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

Michigan Department Energy, Labor & Economic Growth
Wage & Hour Division
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

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. (REV 09/29/09)

State of Michigan
Department of Energy, Labor and Economic Growth

Wage and Hour Division
7150 Harris Dr.
PO Box 30476
Lansing, MI 48909-7976
Telephone: 517-322-1825
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Official Request #: 516
Requestor: TROY SCHOOL DISTRICT
Project Description: LIGHTING REPLACEMENT
Project Number: Athens High School-Larson Middle-Boulan Park MS

Oakland County
Official 2010 Prevailing Wage Rates for State Funded Projects

Issue Date: 4/1/2010
Contract must be awarded by: 6/30/2010

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	8/6/2009	$35.55	$47.67	$59.78	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-	AS207	11/4/2009	$35.55	$48.15	$60.75	H H H X X X X D Y
Boilermaker						
Boilermaker	BO169	8/14/2009	$54.70	$81.08	$107.45	H H H H H H H D Y
Apprentice Rates:						
1st 6 months			$40.31	$59.49	$78.67	
2nd 6 months			$41.45	$61.21	$80.95	
3rd 6 months			$42.57	$62.88	$83.19	
4th 6 months			$43.69	$64.57	$85.43	
5th 6 months			$44.81	$66.24	$87.67	
6th 6 months			$49.53	$73.40	$97.26	
7th 6 months			$49.32	$73.01	$96.69	
8th 6 months			$51.58	$76.40	$101.21	
Bricklayer						
Bricklayer, stone mason, pointer, cleaner, caulker	BR1	12/4/2008	$50.18	$75.27	$100.36	H H D H D D D D N
Apprentice Rates:						
First 6 months			$30.22	$45.33	$60.44	
2nd 6 months			$32.07	$48.10	$64.14	
3rd 6 months			$33.92	$50.88	$67.84	
4th 6 months			$35.77	$53.66	$71.54	
5th 6 months			$37.62	$56.43	$75.24	
6th 6 months			$39.47	$59.20	$78.94	
7th 6 months			$41.32	$61.98	$82.64	
8th 6 months			$43.17	$64.76	$86.34	

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Carpenter						
Carpet and Resilient Floor Layer, (does not include installation of prefabricated formica & parquet flooring which is to be paid carpenter rate)	CA1045	2/2/2009	$43.24	$61.36	$79.47	H H H H D D D D N
Apprentice Rates:						
1st 6 months			$21.10	$28.15	$35.19	
2nd 6 months			$25.12	$34.17	$43.23	
3rd 6 months			$26.93	$36.89	$46.85	
4th 6 months			$28.75	$39.62	$50.49	
5th 6 months			$30.56	$42.34	$54.11	
6th 6 months			$32.37	$45.06	$57.73	
7th 6 months			$34.17	$47.75	$61.33	
8th 6 months			$35.99	$50.48	$64.97	
Carpenter	CA687Z1	1/29/2009	$48.05	$68.47	$88.89	H H D H D D D D Y
Apprentice Rates:						
1st Year			$29.68	$40.91	$52.15	
3rd 6 months			$31.72	$43.98	$56.23	
4th 6 months			$33.75	$47.02	$60.29	
5th 6 months			$35.80	$50.09	$64.39	
6th 6 months			$37.85	$53.17	$68.49	
7th 6 months			$39.89	$56.24	$72.57	
8th 6 months			$41.93	$59.29	$76.65	
Piledriver	CA687Z1P	1/29/2009	$48.05	$68.47	$88.89	H H D H D D D D Y
Apprentice Rates:						
1st 6 months			$29.68	$40.91	$52.15	
2nd 6 months			$33.75	$47.02	$60.29	
3rd 6 months			$37.85	$53.17	$68.49	
4th 6 months			$41.93	$59.29	$76.65	
Subdivision of county .						
Cement Mason						
Cement Mason	br1cm	12/30/2009	$45.50	$64.36	$83.22	H H D H H H H D N
Apprentice Rates:						
1st 6 months			$26.41	$35.85	$45.29	
2nd 6 months			$28.28	$38.66	$49.03	
3rd 6 months			$32.06	$44.33	$56.59	
4th 6 months			$35.82	$49.97	$64.11	
5th 6 months			$37.71	$52.80	$67.89	
6th 6 months			$41.48	$58.46	$75.43	

Official 2010 Prevailing Wage Rates for State Funded Projects

Issue Date: 4/1/2010

Contract must be awarded by: 6/30/2010

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Cement Mason	CE514	9/25/2009	$44.36	$62.68	$80.99	H H D H H H H D N
Apprentice Rates:						
1st 6 months			$24.89	$34.06	$43.22	
2nd 6 months			$26.71	$36.79	$46.86	
3rd 6 months			$30.38	$42.30	$54.20	
4th 6 months			$34.03	$47.77	$61.50	
5th 6 months			$35.87	$50.53	$65.18	
6th 6 months			$39.53	$56.02	$72.50	
Drywall						
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	11/19/2007	$45.37	$65.63	$85.90	H H H H H H H D Y
Apprentice Rates:						
1st 6 months			$29.17	$41.34	$53.50	
2nd 6 months			$31.19	$44.36	$57.54	
3rd 6 months			$33.21	$47.40	$61.58	
4th 6 months			$35.23	$50.43	$65.62	
5th 6 months			$37.25	$53.46	$69.66	
6th 6 months			$41.32	$59.57	$77.80	
Subdivision of county Holly not included						
Inside Wireman	EC-58-IW	1/7/2008	$53.62	$71.49	$89.36	H H H H H H H D N
Apprentice Rates:						
0-1000 hours			$32.18	$39.33	$46.48	
1000-2000 hours			$33.97	$42.02	$50.06	
2000-3500 hours			$35.75	$44.68	$53.62	
3500-5000 hours			$37.54	$47.38	$57.20	
5000-6500 hours			$41.12	$52.74	$64.36	
6500-8000 hours			$44.68	$58.08	$71.48	

Official Request 516
Requestor: TROY SCHOOL DISTRICT
Project Description: LIGHTING REPLACEMENT

Project Number: Athens High School-Larson Middle-Boulan Park MS
County: Oakland

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Sound and Communication Installer/Technician	EC-58-SC	1/7/2008	$32.54	$44.20	$55.86	H H H H H H H D N
Apprentice Rates:						
Period 1			$20.88	$26.71	$32.54	
Period 2			$22.04	$28.46	$34.86	
Period 3			$23.21	$30.21	$37.20	
Period 4			$24.38	$31.96	$39.54	
Period 5			$25.55	$33.72	$41.88	
Period 6			$26.71	$35.46	$44.20	
Lineman/Technician outside utility and commercial power and high voltage pipe type cable work and electrical underground. Four 10s allowed Monday-Thursday with Friday makeup or Tuesday-Friday with Monday makeup.	EC-876	11/18/2009	$47.05	$68.11	$89.17	H H H H H H H D Y
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 Holly Township only						
Elevator Constructor						
Elevator Constructor	EL 36	8/7/2007	$56.46		$94.99	D D D D D D D D Y
Apprentice Rates:						
1st Year Apprentice			$37.74		$58.93	
2nd Year Apprentice			$41.90		$66.94	
3rd Year Apprentice			$43.98		$70.95	
4th Year Apprentice			$48.14		$78.96	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Glazier						
Glazier	GL-357		$45.20	$59.80		H H H H H H H H Y
If a four 10 hour day workweek is scheduled, four 10s must be consecutive, M-F.		6/10/2009				
Apprentice Rates:						
1st 6 months			$31.29	$38.59		
2nd 6 months			$32.82	$40.85		
3rd 6 months			$35.89	$45.38		
4th 6 months			$37.42	$47.64		
5th 6 months			$38.96	$49.91		
6th 6 months			$40.49	$52.17		
7th 6 months			$42.02	$54.43		
8th 6 months			$45.09	$58.96		
Heat and Frost Insulator						
Spray Insulation	AS25S		$20.14	$29.14		H H H H H H H H N
		3/5/2007				
Heat and Frost Insulator and Asbestos Worker						
Heat and Frost Insulators and Asbestos Workers	AS25		$53.15	$68.54	$83.92	H H H H H H H D Y
Four 10s must be worked for a minimum of 2 weeks consecutively, Monday thru Thursday. All hours worked in excess of 10 will be paid at double time. All hours worked on the fifth day, Monday thru Friday will paid at time and one-half.		8/14/2009				
Apprentice Rates:						
1st Year			$39.30	$47.76	$56.22	
2nd Year			$42.38	$52.38	$62.38	
3rd Year			$43.92	$54.69	$65.46	
4th Year			$47.00	$59.31	$71.62	
Ironworker						
Fence, Sound Barrier & Guardrail erection/installation and Exterior Signage work	IR-25-F1		$30.80	$42.63	$54.45	X X H X X X D D Y
Four ten hour work days may be worked during Monday-Saturday.		8/13/2009				
Apprentice Rates:						
60% Level			$21.10	$28.19	$35.29	
65% Level			$22.31	$30.00	$37.68	
70% Level			$23.53	$31.81	$40.09	
75% Level			$24.74	$33.61	$42.48	
80% Level			$25.95	$35.41	$44.87	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Siding, Glazing, Curtain Wall 4 tens may be worked Monday thru Thursday @ straight time. If bad weather, Friday may be a make up day. If holiday celebrated on a Monday, 4 10s may be worked Tuesday thru Friday. Work in excess of 12 hours per day must be paid @ double time.	IR-25-GZ2	8/14/2009	$41.86	$52.62	$63.37	H H H H H H D D Y
Apprentice Rates:						
Level 1			$25.93	$32.38	$38.84	
Level 2			$27.99	$34.98	$41.97	
Level 3			$30.06	$37.59	$45.12	
Level 4			$32.13	$40.20	$48.26	
Level 5			$34.19	$42.80	$51.40	
Level 6			$36.26	$45.40	$54.54	
Pre-engineered Metal Work	IR-25-PE-Z1-Z2	5/8/2008	$41.69	$52.37	$63.04	X X H X X X X D Y
Apprentice Rates:						
1st level			$23.47	$28.51	$33.55	
2nd level			$25.12	$30.85	$36.58	
3rd level			$26.78	$33.19	$39.61	
4th level			$28.44	$35.55	$42.66	
5th level			$30.10	$37.90	$45.70	
6th level			$31.36	$39.65	$47.93	
Reinforced Iron Work	IR-25-RF	8/14/2009	$51.36	$73.35	$95.34	H H D H D D D D N
Apprentice Rates:						
Level 1			$31.67	$43.52	$55.36	
Level 2			$34.21	$47.33	$60.44	
Level 3			$36.74	$51.12	$65.50	
Level 4			$39.28	$54.93	$70.58	
Level 5			$41.81	$58.73	$75.64	
Level 6			$44.35	$62.54	$80.72	
Rigging Work	IR-25-RIG	8/14/2009	$56.98	$85.28	$113.58	H H H H H H H D N
Apprentice Rates:						
Level 1& 2			$32.28	$48.17	$64.05	
Level 3			$35.11	$52.41	$69.71	
Level 4			$37.93	$56.64	$75.35	
Level 5			$40.76	$60.89	$81.01	
Level 6			$43.59	$65.13	$86.67	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Decking 4 tens may be worked Monday thru Thursday @ straight time. If bad weather, Friday may be a make up day. If holiday celebrated on a Monday, 4 10s may be worked Tuesday thru Friday. Work in excess of 12 hours per day must be paid @ double time.	IR-25-SD	8/14/2009	$48.94	$73.16	$97.37	H H H H H H D D Y
Structural, ornamental, conveyor, welder and pre-cast 4 tens may be worked Monday thru Thursday @ straight time. If bad weather, Friday may be a make up day. If holiday celebrated on a Monday, 4 10s may be worked Tuesday thru Friday. Work in excess of 12 hours per day must be paid @ double time.	IR-25-STR	8/14/2009	$57.11	$85.41	$113.71	H H H H H H D D Y
Apprentice Rates:						
Levels 1 & 2			$32.28	$48.17	$64.05	
Level 3			$35.11	$52.41	$69.71	
Level 4			$37.93	$56.64	$75.35	
Level 5			$40.76	$60.89	$81.01	
Level 6			$43.58	$65.12	$86.65	
Level 7			$46.41	$69.37	$92.31	
Level 8			$49.24	$73.60	$97.97	
Industrial Door erection & construction	IR-25-STR-D	3/28/2008	$35.72	$47.34	$58.96	H H D H H H D D Y
Laborer						
Construction Laborer, Mason Tender, Carpenter Tender, Drywall Handler, Concrete Laborer, Cement Finisher tender, concrete chute and concrete Bucket Handler, Concrete Laborer, Demolition Laborer	L1076-A-A	11/9/2009	$38.76	$54.96	$71.15	H H D H D D D D Y
Apprentice Rates:						
0-1,000 work hours			$32.99	$46.30	$59.61	
1,001-2,000 work hours			$34.14	$48.02	$61.91	
2,001-3,000 work hours			$35.30	$49.76	$64.23	
3,001-4,000 work hours			$37.61	$53.23	$68.85	
Signal man (on sewer & caisson work); air,electric or gasoline tool operator (including concrete vibrator operator,acetylene torch & air hammer operator); scaffold builder, caisson worker	L1076-A-B	7/10/2009	$39.02	$55.35	$71.67	H H D H D D D D Y
Lansing Burner, Blaster & Powder Man	L1076-A-C	7/10/2009	$39.51	$56.08	$72.65	H H D H D D D D Y
Furnance battery heater tender, burning bar & oxy-acetylene gun, expediter man, top man and/or bottom man (blast furnace work)	L1076-A-D	7/10/2009	$39.26	$55.71	$72.15	H H D H D D D D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Cleaner/ sweeper laborer, furniture laborer	L1076-A-E	7/10/2009	$33.31	$46.78	$60.25	H H D H D D D D Y
Demolition Laborer	L1076-D	7/10/2009	$38.76	$54.96	$71.15	H H D H D D D D Y
Plasterer Tender, Plastering Machine Operator	LPT-1	8/6/2009	$40.14	$57.03	$73.91	H H D H D D D D N
Apprentice Rates:						
0 - 1,000 hours			$32.99	$46.30	$59.61	
1,001 - 2,000 hours			$34.14	$48.02	$61.91	
2,001 - 3,000 hours			$35.30	$49.76	$64.23	
3,001 - 4,000 hours			$37.61	$53.23	$68.85	
Laborer - Hazardous						
Class A Laborer - 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 used of personal protective equipment level "D" is required.	LHAZ-Z2-A	11/14/2008	$38.76	$54.89	$71.01	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$32.88	$46.07	$59.25	
1,001-2,000 work hours			$34.05	$47.82	$61.59	
2,001-3,000 work hours			$35.23	$49.60	$63.95	
3,001-4,000 work hours			$37.58	$53.12	$68.65	
Class B Laborer - 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-Z2-B	11/14/2008	$39.76	$56.39	$73.01	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$33.62	$47.18	$60.73	
1,001-2,000 work hours			$34.85	$49.02	$63.19	
2,001-3,000 work hours			$36.08	$50.87	$65.65	
3,001-4,000 work hours			$38.53	$54.54	$70.55	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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-Z1-1	9/10/2009	$34.54	$45.23	$55.91	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.72	$38.00	$46.27	
1,001-2,000 work hours			$30.69	$39.45	$48.21	
2,001-3,000 work hours			$31.65	$40.89	$50.13	
3,001-4,000 work hours			$33.58	$43.78	$53.99	
Class II - Manhole, headwall, catch basin builder, bricklayer tender, mortar man, material mixer, fence erector, and guard rail builder.	LAUCT-Z1-2	9/10/2009	$34.65	$45.39	$56.13	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.81	$38.13	$46.45	
1,001-2,000 work hours			$30.77	$39.57	$48.37	
2,001-3,000 work hours			$31.74	$41.02	$50.31	
3,001-4,000 work hours			$33.68	$43.94	$54.19	
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	LAUCT-Z1-3	9/10/2009	$34.71	$45.48	$56.25	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.85	$38.19	$46.53	
1,001-2,000 work hours			$30.82	$39.64	$48.47	
2,001-3,000 work hours			$31.79	$41.10	$50.41	
3,001-4,000 work hours			$33.74	$44.02	$54.31	
Class IV - Tunnel, shaft and caisson mucker, bracer man, liner plate man, long haul dinky driver and well point	LAUCT-Z1-4	9/10/2009	$34.89	$45.75	$56.61	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$29.99	$38.40	$46.81	
1,001-2,000 work hours			$30.97	$39.87	$48.77	
2,001-3,000 work hours			$31.95	$41.34	$50.73	
3,001-4,000 work hours			$33.91	$44.28	$54.65	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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-Z1-5	9/10/2009	$35.14	$46.13	$57.11	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$30.17	$38.67	$47.17	
1,001-2,000 work hours			$31.17	$40.17	$49.17	
2,001-3,000 work hours			$32.16	$41.66	$51.15	
3,001-4,000 work hours			$34.15	$44.64	$55.13	
Class VI - Dynamite man and powder man.	LAUCT-Z1-6	9/10/2009	$35.47	$46.62	$57.77	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$30.42	$39.04	$47.67	
1,001-2,000 work hours			$31.43	$40.56	$49.69	
2,001-3,000 work hours			$32.44	$42.08	$51.71	
3,001-4,000 work hours			$34.46	$45.10	$55.75	
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-Z1-7	9/10/2009	$28.75	$36.54	$44.33	H H H H H H H D Y
Apprentice Rates:						
0-1,000 work hours			$25.38	$31.48	$37.59	
1,001-2,000 work hours			$26.05	$32.49	$38.93	
2,001-3,000 work hours			$26.73	$33.51	$40.29	
3,001-4,000 work hours			$28.08	$35.54	$42.99	
Landscape Laborer						
Landscape Specialist includes air, gas, and diesel equipment operator, 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	LLAN-Z1-A	7/9/2009	$25.38	$35.06	$44.74	X X H X X X H D Y
All work pertaining to landscaping where seeding, sodding, planting, cutting, trimming, backfilling, rough grading or maintaining of landscape projects occurs which may include small power tool operator, lawn sprinkler installer helper, material mover, & truck driver. Sundays paid at time & one half. Holidays paid at double time.	LLAN-Z1-B	7/9/2009	$21.16	$28.73	$36.30	X X H X X X H D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Marble Finisher						
Marble Finisher	BR1-MF		$41.37	$51.86	$62.34	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	
Marble Mason						
Marble Mason	BR1-MM		$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.		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	
Operating Engineer						
Crane with boom & jib or leads 120' or longer	EN-324-A120	1/22/2010	$51.81	$68.75	$85.68	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	1/22/2010	$52.63	$69.98	$87.32	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 220' 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-A220	1/22/2010	$52.93	$70.43	$87.92	H H D H D D D D Y
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	1/22/2010	$54.43	$72.68	$90.92	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	1/22/2010	$55.93	$74.93	$93.92	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	1/22/2010	$40.96	$52.47	$63.98	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	1/22/2010	$48.27	$63.44	$78.60	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	1/22/2010	$39.93	$50.93	$61.92	H H D H D D D D Y

Classification Name Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Regular crane, job mechanic, concrete pump with boom	EN-324-RC	1/22/2010	$50.95	$67.46	$83.96	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.						
Regular engineer, hydro-excavator, remote controlled concrete breaker	EN-324-RE	1/22/2010	$49.98	$66.00	$82.02	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			$39.87	$51.09	$62.30	
1,000-1,999 hours			$41.48	$53.50	$65.52	
2,000-2,999 hours			$43.07	$55.89	$68.70	
3,000-3,999 hours			$44.67	$58.29	$71.90	
4,000-4,999 hours			$46.27	$60.68	$75.10	
5,000-5,999 hours			$47.88	$63.10	$78.32	
Operating Engineer - Marine Construction						
Diver/Wet Tender, Engineer (hydraulic dredge)	GLF-1	1/5/2010	$57.10	$74.85	$92.60	X X H H H H H D Y
Holiday pay= $110.35 per hour						
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	1/5/2010	$55.60	$72.60	$89.60	X X H H H H H D Y
Holiday pay = $106.60 per hour						
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	1/5/2010	$51.85	$66.98	$82.10	X X H H H H H D Y
Holiday pay = $97.22 per hour						
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
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	1/5/2010	$46.75	$59.33	$71.90	X X H H H H H D Y
Subdivision of county All Great Lakes, islands therein, & connecting & tributary waters						
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-Z1A	10/1/2009	$49.74	$65.66	$81.57	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday						
Apprentice Rates:						
1st 6 months			$39.70	$50.85	$61.99	
2nd 6 months			$41.28	$53.22	$65.15	
3rd 6 months			$42.87	$55.60	$68.33	
4th 6 months			$44.47	$58.01	$71.53	
5th 6 months			$46.06	$60.38	$74.71	
6th 6 months			$47.66	$62.79	$77.91	
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-Z1B	10/1/2009	$48.79	$64.23	$79.67	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			$39.02	$49.82	$60.63	
2nd 6 months			$40.57	$52.15	$63.73	
3rd 6 months			$42.11	$54.46	$66.81	
4th 6 months			$43.65	$56.77	$69.89	
5th 6 months			$45.20	$59.10	$72.99	
6th 6 months			$46.75	$61.42	$76.09	

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.		EN-324-HWCI-Z1D 10/2/2009	$47.49	$62.28	$77.07	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		$38.11	$48.46	$58.81	
	2nd 6 months		$39.59	$50.69	$61.77	
	3rd 6 months		$41.08	$52.92	$64.75	
	4th 6 months		$42.55	$55.12	$67.69	
	5th 6 months		$44.03	$57.34	$70.65	
	6th 6 months		$45.50	$59.54	$73.59	
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.		EN-324-HWCI-Z1DCL 10/2/2009	$47.24	$61.91	$76.57	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		$37.94	$48.21	$58.47	
	2nd 6 months		$39.40	$50.40	$61.39	
	3rd 6 months		$40.87	$52.60	$64.33	
	4th 6 months		$42.34	$54.81	$67.27	
	5th 6 months		$43.80	$56.99	$70.19	
	6th 6 months		$45.26	$59.19	$73.11	
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.		EN-324-HWCII-Z1A 10/1/2009	$45.51	$59.31	$73.11	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday						
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-HWCII-Z1B 10/2/2009	$44.56	$57.89	$71.21	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.						

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-HWCII-Z1D	10/2/2009	$43.26	$55.94	$68.61	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-Z1DCL	10/2/2009	$43.01	$55.56	$68.11	H H H H H H H D Y
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	EN-324-HW140-Z1A	10/1/2009	$52.39	$69.63	$86.87	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-Z1B	10/1/2009	$51.44	$68.21	$84.97	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-Z1D	10/2/2009	$50.14	$66.26	$82.37	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-Z1DCL	10/2/2009	$49.89	$65.88	$81.87	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 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.	EN-324-HW220-Z1A	10/1/2009	$52.69	$70.08	$87.47	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday						
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-HW220-Z1B	10/1/2009	$51.74	$68.66	$85.57	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.						
Level D Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z1D	10/2/2009	$50.44	$66.71	$82.97	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.						
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HW220-Z1DCL	10/2/2009	$50.19	$66.33	$82.47	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.						
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with boom						
Level D When Capping Landfill Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z1DCL	10/2/2009	$47.59	$62.43	$77.27	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.						
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with Boom Operator						
Level D - Coveralls, safety boots, glasses or chemical splash goggles and hard hats.	EN-324-HWRC-Z1D	10/2/2009	$48.46	$63.74	$79.01	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.						

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operator and Concrete Pump with booms						
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-HWRC-Z1B	10/1/2009	$49.76	$65.69	$81.61	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.						
Operating Engineer Hazardous Waste Regular Crane, Job Mechanic, Dragline Operator, Boom Truck Operator, Power Shovel Operators and Concrete Pump with booms						
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-HWRC-Z1A	10/1/2009	$50.71	$67.11	$83.51	H H H H H H H D Y
Four 10 hour days may be worked Monday-Thursday						
Operating Engineer Steel Work						
Forklift, 1 Drum Hoist	EN-324-ef	6/2/2009	$54.06	$71.85	$89.63	H H D H H H D D Y
Crane w/ 120' boom or longer	EN-324-SW120	6/2/2009	$56.51	$75.52	$94.53	H H D H H H D D Y
Crane w/ 120' boom or longer w/ Oiler	EN-324-SW120-O	6/2/2009	$57.51	$77.02	$96.53	H H D H H H D D Y
Crane w/ 140' boom or longer	EN-324-SW140	6/2/2009	$57.69	$77.29	$96.89	H H D H H H D D Y
Crane w/ 140' boom or longer W/ Oiler	EN-324-SW140-O	6/2/2009	$58.69	$78.79	$98.89	H H D H H H D D Y
Boom & Jib 220' or longer	EN-324-SW220	6/2/2009	$57.96	$77.70	$97.43	H H D H H H D D Y
Crane w/ 220' boom or longer w/ Oiler	EN-324-SW220-O	6/2/2009	$58.96	$79.20	$99.43	H H D H H H D D Y
Boom & Jib 300' or longer	EN-324-SW300	6/2/2009	$59.46	$79.95	$100.43	H H D H H H D D Y
Crane w/ 300' boom or longer w/ Oiler	EN-324-SW300-O	6/2/2009	$60.46	$81.45	$102.43	H H D H H H D D Y
Boom & Jib 400' or longer	EN-324-SW400	6/2/2009	$60.96	$82.20	$103.43	H H D H H H D D Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Crane w/ 400' boom or longer w/ Oiler	EN-324-SW400-O	6/2/2009	$61.96	$83.70	$105.43	H H D H H H D D Y
Crane Operator, Job Mechanic, 3 Drum Hoist &	EN-324-SWCO	6/2/2009	$56.15	$74.98	$93.81	H H D H H H D D Y
Apprentice Rates:						
0-999 hours			$44.35	$57.53	$70.71	
1,000-1,999 hours			$46.23	$60.35	$74.47	
2,000-2,999 hours			$48.12	$63.19	$78.25	
3,000-3,999 hours			$50.01	$66.02	$82.03	
4,000-4,999 hours			$51.89	$68.84	$85.79	
5,000 hours			$53.77	$71.66	$89.55	
Crane w/ Oiler	EN-324-SWCO-O	6/2/2009	$57.15	$76.48	$95.81	H H D H H H D D Y
Compressor or Welder Operator	EN-324-SWCW	6/2/2009	$48.70	$63.81	$78.91	H H D H H H D D Y
Hoisting Operator, 2 Drum Hoist, & Rubber Tire Backhoe	EN-324-SWHO	6/2/2009	$55.51	$74.02	$92.53	H H D H H H D D Y
Oiler	EN-324-SWO	6/2/2009	$47.29	$61.69	$76.09	H H D H H H D D Y
Tower Crane & Derrick where work is 50' or more above first level	EN-324-SWTD50	6/2/2009	$57.24	$76.62	$95.99	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	6/2/2009	$58.24	$78.12	$97.99	H H D H H H D D Y
Operating Engineer Underground						
Class I Equipment	EN-324A1-UC1	9/10/2009	$47.24	$61.88	$76.52	H H H H H H H D Y
Apprentice Rates:						
0-999 hours			$37.95	$48.20	$58.44	
1,000-1,999 hours			$39.43	$50.42	$61.40	
2,000-2,999 hours			$40.89	$52.61	$64.32	
3,000-3,999 hours			$42.35	$54.80	$67.24	
4,000-4,999 hours			$43.81	$56.98	$70.16	
5,000-5,999 hours			$45.28	$59.19	$73.10	
Class II Equipment	EN-324A1-UC2	9/10/2009	$42.51	$54.79	$67.06	H H H H H H H D Y
Class III Equipment	EN-324A1-UC3	9/10/2009	$41.78	$53.69	$65.60	H H H H H H H D Y
Class IV Equipment	EN-324A1-UC4	9/10/2009	$41.21	$52.84	$64.46	H H H H H H H D Y

Official Request 516
Requestor: TROY SCHOOL DISTRICT
Project Description: LIGHTING REPLACEMENT

Project Number: Athens High School-Larson Middle-Boulan Park MS
County: Oakland

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

Classification Name Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Master Mechanic	EN-324A1-UMM	9/10/2009	$47.49	$62.26	$77.02	H H H H H H H D Y
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	6/16/2009	$26.00	$34.90		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	6/16/2009	$30.50	$41.65		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	6/16/2009	$29.25	$39.77		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	6/16/2009	$31.00	$42.40		H H H H H H H H N
Combo Unit driver & Jetter-Vac Operator	TM247-5	6/22/2009	$31.00	$42.40		H H H H H H H H N
Pipe Bursting & Slip-lining Equipment Operator	TM247-6	6/22/2009	$32.00	$43.90		H H H H H H H H N

Classification Name	Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Pipefitter							
Pipefitter		PF-636		$59.71	$79.56	$95.91	H H D H D D D D N
			7/9/2009				
	Apprentice Rates:						
	1st & 2nd periods			$26.33	$34.68	$41.68	
	3rd period			$28.33	$37.68	$45.68	
	4th period			$29.58	$39.56	$48.18	
	5th period			$30.83	$41.43	$50.68	
	6th period			$32.08	$43.30	$53.18	
	7th period			$33.33	$45.18	$55.68	
	8th period			$34.33	$46.68	$57.68	
	9th period			$35.33	$48.18	$59.68	
	10th period			$36.76	$50.32	$62.54	
Plasterer							
Plasterer		BR1P		$43.84	$65.76	$87.68	H H H H H H H D N
			12/16/2008				
	Apprentice Rates:						
	1st 6 months			$22.41	$33.62	$44.82	
	2nd 6 months			$25.99	$38.99	$51.98	
	3rd 6 months			$29.56	$44.34	$59.12	
	4th 6 months			$33.13	$49.70	$66.26	
	5th 6 months			$36.70	$55.05	$73.40	
	6th 6 months			$40.27	$60.41	$80.54	
Plasterer		PL67		$42.87	$58.16	$73.45	H H H X D D D D N
			6/4/2007				
	Apprentice Rates:						
	1st 6 months			$24.52	$30.63	$36.75	
	2nd 6 months			$27.58	$35.23	$42.87	
	3rd 6 months			$30.64	$39.81	$48.99	
	4th 6 months			$33.70	$44.41	$55.11	
	5th 6 months			$36.75	$48.98	$61.21	
	6th 6 months			$39.81	$53.57	$67.33	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Plumber						
Plumber	PL-98	8/18/2009	$57.58	$74.45	$89.31	H H D H D D D D N
	Apprentice Rates:					
	Period 1		$17.76	$24.31	$30.86	
	Period 2		$17.76	$24.31	$30.86	
	Period 3		$30.79	$39.88	$48.96	
	Period 4		$31.42	$40.82	$50.22	
	Period 5		$32.58	$42.56	$52.54	
	Period 6		$33.73	$44.28	$54.84	
	Period 7		$34.88	$43.61	$54.74	
	Period 8		$36.05	$47.76	$59.48	
	Period 9		$37.20	$49.49	$61.78	
	Period 10		$38.35	$51.22	$64.08	
Roofer						
Commercial Roofer Straight time is not to exceed ten (10) hours per day or forty (40) hours per week.	RO-149-WOM	8/18/2008	$48.46	$62.29	$76.62	H H D H H H D D N
	Apprentice Rates:					
	Apprentice 1		$32.62	$39.86	$48.04	
	Apprentice 2		$36.80	$44.80	$53.30	
	Apprentice 3		$38.22	$46.93	$56.14	
	Apprentice 4		$39.25	$48.48	$58.20	
	Apprentice 5		$40.47	$50.30	$60.64	
	Apprentice 6		$41.87	$52.40	$63.44	
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	11/10/2009	$40.32	$54.65	$68.97	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	11/10/2009	$38.79	$52.35	$65.91	H H H H H H H D N
Sheet Metal Worker						
Sheet Metal Worker A 4 10 schedule may be worked during Monday thru	SHM-80	8/18/2009	$57.23	$74.59	$91.94	H H D H D D D D Y
	Apprentice Rates:					
	First Year		$39.07	$47.92	$56.75	
	Second Year		$40.39	$49.89	$59.39	
	Third Year		$41.75	$51.93	$62.11	
	Fourth Year		$44.42	$55.93	$67.45	
	Fifth Year		$47.12	$59.99	$72.85	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Siding & Decking	SHM-80-SD	9/2/2009	$39.32	$51.57	$63.82	H H H H H H H D Y
Sprinkler Fitter						
Sprinkler Fitter 4 ten hour days allowed Monday-Friday only in those weeks containing a holiday and the preceding or succeeding the holiday week	SP 704	12/29/2009	$59.87	$78.91	$97.95	H H D H D D D D Y
Apprentice Rates:						
1st Period			$23.88	$31.49	$39.11	
2nd Period			$38.93	$47.50	$56.07	
3rd Period			$40.83	$50.35	$59.87	
4th Period			$42.73	$53.20	$63.67	
5th Period			$44.64	$56.07	$67.49	
6th Period			$46.54	$58.91	$71.29	
7th Period			$48.45	$61.78	$75.11	
8th Period			$50.35	$64.63	$78.91	
9th Period			$52.25	$67.48	$82.71	
10th Period			$54.16	$70.35	$86.53	
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	

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
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	
Tile						
Tile Finisher A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.	BR1-TF	8/11/2009	$41.39	$51.89	$62.38	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	
Tile Layer A 4 ten workweek may be worked Monday thru Thursday or Tuesday thru Friday.	BR1-TL	8/11/2009	$47.26	$60.69	$74.12	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	
Truck Driver						
on all trucks of 8 cubic yard capacity or less	TM-RB1	9/17/2009	$36.84	$36.44		H H H H H H H H Y

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
of all trucks of 8 cubic yard capacity or over	TM-RB1A	9/17/2009	$36.94	$36.59		H H H H H H H H Y
on euclid type equipment	TM-RB1B	9/17/2009	$37.09	$36.81		H H H H H H H H Y
Underground Laborer Open Cut, Class I						
Construction Laborer	LAUC-Z1-1	9/10/2009	$34.39	$45.00	$55.61	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$29.61	$37.83	$46.05	
	1,001-2,000 work hours		$30.57	$39.27	$47.97	
	2,001-3,000 work hours		$31.52	$40.70	$49.87	
	3,001-4,000 work hours		$33.43	$43.56	$53.69	
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-Z1-2	9/10/2009	$34.50	$45.17	$55.83	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$29.69	$37.95	$46.21	
	1,001-2,000 work hours		$30.65	$39.39	$48.13	
	2,001-3,000 work hours		$31.62	$40.84	$50.07	
	3,001-4,000 work hours		$33.54	$43.72	$53.91	
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-Z1-3	9/10/2009	$34.55	$45.24	$55.93	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$29.73	$38.01	$46.29	
	1,001-2,000 work hours		$30.69	$39.45	$48.21	
	2,001-3,000 work hours		$31.66	$40.90	$50.15	
	3,001-4,000 work hours		$33.59	$43.80	$54.01	
Underground Laborer Open Cut, Class IV						
Trench or excavating grade man.	LAUC-Z1-4	9/10/2009	$34.63	$45.36	$56.09	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$29.79	$38.10	$46.41	
	1,001-2,000 work hours		$30.76	$39.56	$48.35	
	2,001-3,000 work hours		$31.73	$41.01	$50.29	
	3,001-4,000 work hours		$33.66	$43.90	$54.15	

Official Request 516
Requestor: TROY SCHOOL DISTRICT
Project Description: LIGHTING REPLACEMENT

Project Number: Athens High School-Larson Middle-Boulan Park MS
County: Oakland

Official Rate Schedule

Every contractor and subcontractor shall keep posted on the construction site, in a conspicuous place, a copy of all prevailing wage and fringe benefit rates prescribed in a contract.

Classification Name / Description		Last Updated	Straight Hourly	Time and a Half	Double Time	Overtime Provision
Underground Laborer Open Cut, Class V						
Pipe Layer	LAUC-Z1-5	9/10/2009	$34.69	$45.45	$56.21	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$29.83	$38.16	$46.49	
	1,001-2,000 work hours		$30.81	$39.63	$48.45	
	2,001-3,000 work hours		$31.78	$41.08	$50.39	
	3,001-4,000 work hours		$33.72	$44.00	$54.27	
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 and repair of water service pipe and appurtenances.	LAUC-Z1-6	9/10/2009	$32.14	$41.63	$51.11	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$27.92	$35.30	$42.67	
	1,001-2,000 work hours		$28.77	$36.57	$44.37	
	2,001-3,000 work hours		$29.61	$37.83	$46.05	
	3,001-4,000 work hours		$31.30	$40.36	$49.43	
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-Z1-7	9/10/2009	$28.76	$36.56	$44.35	H H H H H H H D Y
	Apprentice Rates:					
	0-1,000 work hours		$25.39	$31.50	$37.61	
	1,001-2,000 work hours		$26.06	$32.50	$38.95	
	2,001-3,000 work hours		$26.74	$33.52	$40.31	
	3,001-4,000 work hours		$28.09	$35.55	$43.01	

SECTION 00410 - BID FORM

OWNER: Troy School District
4400 Livernois
Troy, Michigan 48098

PROJECT: Troy School District
Lighting Replacement
Athens High School,
Boulan Park Middle School and
Larson Middle School
TSD Bid No. 9670
Troy, Michigan

ARCHITECT: Integrated Design Solutions, LLC
Architecture, Engineering, Interiors & Technology
1441 W. Long Lake, Suite 200
Troy, Michigan 48098
(248) 823-2100
(248) 823-2200 fax

NAME OF BIDDER: _____

ADDRESS: _____

_____

TELEPHONE: _____

BID

Pursuant to and in compliance with your Advertisement for Bids Instructions to Bidders and other documents relating thereto, the undersigned proposes and agrees to furnish equipment, materials, and labor and perform all work necessary to complete the Lighting Replacement, Athens High School, Boulan Park Middle School and Larson Middle School, for the TSD Bid No. 9670 Project in accordance with the Drawings and Specifications prepared by Integrated Design Solutions, LLC dated April 20, 2010, and agrees to accept payment as herein provided.

BASE BID

ATHENS HIGH SCHOOL

Lump sum bid for all work specified and shown on the Drawings as indicated for base bid.

_____

_____ Dollars ($_____).

NOTE:

The amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

BOULAN PARK MIDDLE SCHOOL

Lump sum bid for all work specified and shown on the Drawings as indicated for base bid.

_____

_____ Dollars ($_____).

NOTE:

The amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

LARSON MIDDLE SCHOOL

Lump sum bid for all work specified and shown on the Drawings as indicated for base bid.

_____

_____ Dollars ($_____).

NOTE:

The amount shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

MANDATORY ALTERNATES

The foregoing Base Bids may be increased or decreased by the amounts herein quoted for Alternates. The following alternate prices shall include all charges for labor, material, and equipment, bonds, overhead and profit, general conditions, supervision, insurance, taxes, and incidental expenses.

Athens High School Mandatory Alternate No. 1: Surface preparation and field painting of acoustical ceiling panels and grid system in lieu of surface preparation and field painting of acoustical ceiling panels only.

Add/Deduct_____

_____Dollars ($_____).

VOLUNTARY ALTERNATES

Voluntary Alternate No. 1:

Add/Deduct_____

_____Dollars ($_____).

Voluntary Alternate No. 2:

Add/Deduct_____

_____Dollars ($_____).

TAXES

For the purposes of this bid, the Troy School District is tax exempt. Do not include Federal, State or local taxes in the Bid. The Owner's federal and state tax-exempt number is B38.600.3099. Usage taxes shall be included in the base bid price.

BID SECURITY

Accompanying this Bid is a certified check, cashier's check, money order or bid bond (cross out those not applicable) made payable to Troy School District in the amount of five percent (5%), of Base Bid, which shall be retained by the Owner as liquidated damages, if the undersigned fails to execute the contract within ten (10) days of award of the Contract.

ADDENDA

The undersigned acknowledges the receipt of the following addenda:

Addendum No.	_____	Dated	_____	Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____	Addendum No.	_____	Dated	_____
Addendum No.	_____	Dated	_____	Addendum No.	_____	Dated	_____

TIME OF COMPLETION

The undersigned agrees to begin demolition and construction on or after June 28, 2010 and substantially complete the Project by August 15, 2010.

WITHDRAWAL OF BIDS

The undersigned agrees that his Bid shall not be withdrawn for a period of sixty (60) days after the date set for receipt of Bids.

NON-COLLUSION

The undersigned certifies that the bid has not been prepared in collusion with any other bidder and that the prices, discounts, terms and conditions thereof have not been directly or indirectly communicated by or on behalf of the Bidder to any such person other then the recipient of such bid, and will not be communicated to any such person prior to the official opening of said bid. The undersigned fully understands that no premiums, rebates, or gratuities are permitted either with, prior to or after signing the Contract.
This certification may be treated as if it were a sworn statement made under oath, and is made subject to the provisions of 18 U. S. C., 1001, relating to the making of false statements.

SIGNATURE AND LEGAL STATUS OF BIDDER

Signed and sealed this _____ day of _____, 20_____.

_____
(Individual, Partnership, Corporation)

_____
State of Incorporation

Affix Corporate Seal By: _____
(Authorized Signature of Bidder)

_____
(Print or Type Name of Bidder)

_____
Title

_____
Business Address

Instructions: Submit one (1) original and two (2) copies to the Owner and retain one (1) copy for the Bidder's records. Clearly label each copy submitted as either "original" or "copy".

END OF BID FORM

SECTION 00450

FAMILIAL DISCLOSURE STATEMENT

The undersigned, the owner or authorized officer of _____ (the "Bidder"), pursuant to the familial disclosure requirement provided in the _____ (the "School District") advertisement for construction bids, hereby represent and warrant, except as provided below, that no familial relationships exist between the owner(s) or any employee of _____ and any member of the Board of Education of the School District or the Superintendent of the School District.

List any Familial Relationships:

BIDDER:

_____

By: _____

Its: _____

STATE OF MICHIGAN)
)ss.
COUNTY OF _____)

This instrument was acknowledged before me on the _____ day of _____, 20___, by _____.

_____

, Notary Public

_____ County, Michigan

My Commission Expires:_____

Acting in the County of:_____

END OF SECTION

DRAFT

AIA® Document A107™ – 2007

Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope

AGREEMENT made as of the [ ] day of [ ] in the year [ ]
(In words, indicate day, month and year)

BETWEEN the Owner:
(Name, address and other information)

[ ]

and the Contractor:
(Name, address and other information)

[ ]

for the following Project:
(Name, location and detailed description)

00000-00000 Blank Forms

The Architect:
(Name, address and other information)

[ ]

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

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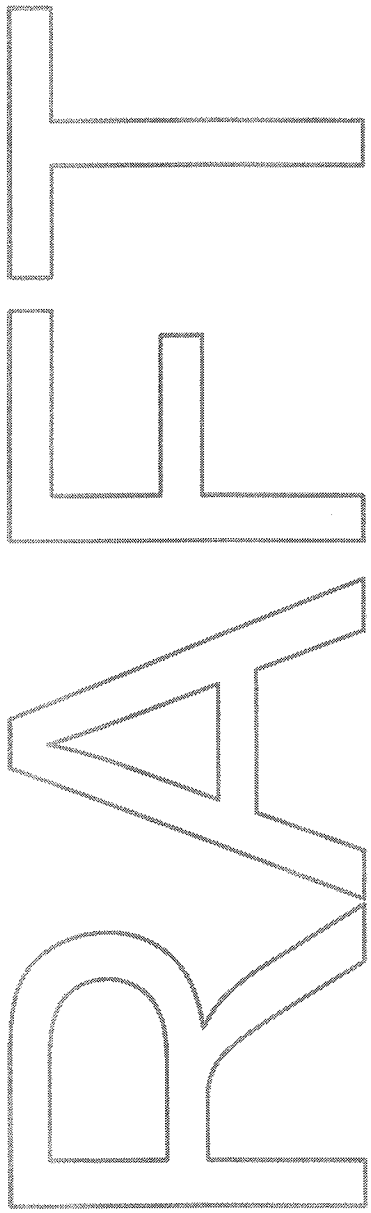
TABLE OF ARTICLES



ARTICLE 1 THE WORK OF THIS CONTRACT

The Contractor shall execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement, if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

§ 2.2 The Contract Time shall be measured from the date of commencement.

§ 2.3 The Contractor shall achieve Substantial Completion of the entire Work not later than ( ) days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

, subject to adjustments of this Contract Time as provided in the Contract Documents.
(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

ARTICLE 3 CONTRACT SUM

§ 3.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[X] Stipulated Sum, in accordance with Section 3.2 below

[ ] Cost of the Work plus the Contractor's Fee, in accordance with Section 3.3 below

[ ] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 3.4 below

(Based on the selection above, complete Section 3.2, 3.3 or 3.4 below.)

§ 3.2 The Stipulated Sum shall be ($), subject to additions and deletions as provided in the Contract Documents.

§ 3.2.1 The Stipulated Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 3.2.2 Unit prices, if any:
(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit

§ 3.2.3 Allowances included in the stipulated sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Allowance

§ 3.3 COST OF THE WORK PLUS CONTRACTOR'S FEE

§ 3.3.1 The Cost of the Work is as defined in Exhibit A, Determination of the Cost of the Work.

§ 3.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee and the method of adjustment to the Fee for changes in the Work.)

§ 3.4 COST OF THE WORK PLUS CONTRACTOR'S FEE WITH A GUARANTEED MAXIMUM PRICE

§ 3.4.1 The Cost of the Work is as defined in Exhibit A, Determination of the Cost of the Work.

§ 3.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee and the method of adjustment to the Fee for changes in the Work.)

§ 3.4.3 GUARANTEED MAXIMUM PRICE

§ 3.4.3.1 The sum of the Cost of the Work and the Contractor's Fee is guaranteed by the Contractor not to exceed ($), subject to additions and deductions by changes in the Work as provided in the Contract Documents. Such maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.
(Insert specific provisions if the Contractor is to participate in any savings.)

§ 3.4.3.2 The Guaranteed Maximum Price is based on the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

§ 3.4.3.3 Unit Prices, if any:
(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit

§ 3.4.3.4 Allowances included in the Guaranteed Maximum Price, if any:
(Identify and state the amounts of any allowances, and state whether they include labor, materials, or both.)

Item	Allowance

§ 3.4.3.5 Assumptions, if any, on which the Guaranteed Maximum Price is based:

ARTICLE 4 PAYMENTS

§ 4.1 PROGRESS PAYMENTS

§ 4.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 4.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 4.1.3 Provided that an Application for Payment is received by the Architect not later than the [ ] day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the [ ] day of the [same] month. If an Application for Payment is received by the Architect after the date fixed above, payment shall be made by the Owner not later than [ ] ([ ]) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 4.1.4 Retainage, if any, shall be withheld as follows:

§ 4.1.5 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

per annum

§ 4.2 FINAL PAYMENT

§ 4.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 18.2, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the contractor has submitted a final accounting for the Cost of the Work, where payment is on the basis of the Cost of the Work with or without a guaranteed maximum price; and

.3 a final Certificate for Payment has been issued by the Architect.

§ 4.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 5 DISPUTE RESOLUTION

§ 5.1 BINDING DISPUTE RESOLUTION

For any claim subject to, but not resolved by, mediation pursuant to Section 21.3, the method of binding dispute resolution shall be as follows:
(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, claims will be resolved in a court of competent jurisdiction.)

[ ] Arbitration pursuant to Section 21.4 of this Agreement

[ ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

[ ]

ARTICLE 6 ENUMERATION OF CONTRACT DOCUMENTS

§ 6.1 The Contract Documents are defined in Article 7 and, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 6.1.1 The Agreement is this executed AIA Document A107–2007, Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope.

§ 6.1.2 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 6.1.3 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)
Title of Specifications exhibit:

§ 6.1.4 The Drawings:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)
Title of Drawings exhibit:

§ 6.1.5 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are enumerated in this Article 6.

§ 6.1.6 Additional documents, if any, forming part of the Contract Documents:

.1 Exhibit A, Determination of the Cost of the Work, if applicable.

.2 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed, or the following:

.3 Other documents:
(List here any additional documents that are intended to form part of the Contract Documents.)

ARTICLE 7 GENERAL PROVISIONS

§ 7.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in Article 6 and consist of this Agreement (including, if applicable, Supplementary and other Conditions of the Contract), Drawings, Specifications, Addenda issued prior to the execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 7.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between any persons or entities other than the Owner and the Contractor.

§ 7.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 7.4 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 7.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 7.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 7.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 7.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmission, unless otherwise provided in the Agreement or in the Contract Documents.

ARTICLE 8 OWNER

§ 8.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 8.1.1 The Owner shall furnish all necessary surveys and a legal description of the site.

§ 8.1.2 The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 8.1.3 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 9.6.1, the Owner shall secure and pay for other necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 8.2 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or repeatedly fails to carry out the Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order is eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

§ 8.3 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner, without prejudice to any other remedy the Owner may have, may correct such deficiencies and may deduct the reasonable cost thereof, including Owner's expenses and compensation for the Architect's services made necessary thereby, from the payment then or thereafter due the Contractor.

ARTICLE 9 CONTRACTOR

§ 9.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 9.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 9.1.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 8.1.1, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies, or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents.

§ 9.1.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 9.2 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 9.2.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters.

§ 9.2.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

§ 9.3 LABOR AND MATERIALS

§ 9.3.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 9.3.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

§ 9.3.3 The Contractor may make a substitution only with the consent of the Owner, after evaluation by the Architect and in accordance with a Modification.

§ 9.4 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation or normal wear and tear under normal usage.

§ 9.5 TAXES

The Contractor shall pay sales, consumer, use and other similar taxes that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 9.6 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

§ 9.6.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as other permits, fees, licenses and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 9.6.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 9.7 ALLOWANCES

The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. The Owner shall select materials and equipment under allowances with reasonable promptness. Allowance amounts shall include the costs to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts. Allowance amounts shall not include the Contractor's costs for unloading and handling at the site, labor, installation, overhead, and profit.

§ 9.8 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 9.8.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 9.8.2 The Contractor shall perform the Work in general accordance with the most recent schedule submitted to the Owner and Architect.

§ 9.9 SUBMITTALS

§ 9.9.1 The Contractor shall review for compliance with the Contract Documents and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in coordination with the Contractor's construction schedule and in such sequence as to allow the Architect reasonable time for review. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them; (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so; and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The Work shall be in accordance with approved submittals.

§ 9.9.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents.

§ 9.10 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 9.11 CUTTING AND PATCHING

The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 9.12 CLEANING UP

The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus material from and about the Project.

§ 9.13 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 9.14 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 9.15 INDEMNIFICATION

§ 9.15.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 9.15.1.

§ 9.15.2 In claims against any person or entity indemnified under this Section 9.15 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 9.15.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 10 ARCHITECT

§ 10.1 The Architect will provide administration of the Contract and will be an Owner's representative during construction, until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 10.2 The Architect will visit the site at intervals appropriate to the stage of the construction to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general, if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 10.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 10.4 Based on the Architect's evaluations of the Work and of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 10.5 The Architect has authority to reject Work that does not conform to the Contract Documents and to require inspection or testing of the Work.

§ 10.6 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 10.7 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect will make initial decisions on all claims, disputes and other matters in question between the Owner and Contractor but will not be liable for results of any interpretations or decisions rendered in good faith.

§ 10.8 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 10.9 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

ARTICLE 11 SUBCONTRACTORS

§ 11.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site.

§ 11.2 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of the Subcontractors or suppliers for each of the principal portions of the Work. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner or Architect has made reasonable written objection within ten days after receipt of the Contractor's list of Subcontractors and suppliers. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 11.3 Contracts between the Contractor and Subcontractors shall (1) require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by the Contract Documents, assumes toward the Owner and Architect, and (2) allow the Subcontractor the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner.

ARTICLE 12 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 12.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under conditions of the contract identical or substantially similar to these, including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such claim as provided in Article 21.

§ 12.2 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's activities with theirs as required by the Contract Documents.

§ 12.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The

Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

ARTICLE 13 CHANGES IN THE WORK

§ 13.1 By appropriate Modification, changes in the Work may be accomplished after execution of the Contract. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and Contract Time being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Owner, Contractor and Architect, or by written Construction Change Directive signed by the Owner and Architect.

§ 13.2 Adjustments in the Contract Sum and Contract Time resulting from a change in the Work shall be determined by mutual agreement of the parties or, in the case of a Construction Change Directive signed only by the Owner and Architect, by the Contractor's cost of labor, material, equipment, and reasonable overhead and profit, unless the parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive. The Architect will make an interim determination of the amount of payment due for purposes of certifying the Contractor's monthly Application for Payment. When the Owner and Contractor agree on adjustments to the Contract Sum and Contract Time arising from a Construction Change Directive, the Architect will prepare a Change Order.

§ 13.3 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

§ 13.4 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be equitably adjusted as mutually agreed between the Owner and Contractor; provided that the Contractor provides notice to the Owner and Architect promptly and before conditions are disturbed.

ARTICLE 14 TIME

§ 14.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 14.2 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 14.3 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 14.4 The date of Substantial Completion is the date certified by the Architect in accordance with Section 15.4.3.

§ 14.5 If the Contractor is delayed at any time in the commencement or progress of the Work by changes ordered in the Work, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions not reasonably anticipatable, unavoidable casualties or any causes beyond the Contractor's control, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine, subject to the provisions of Article 21.

ARTICLE 15 PAYMENTS AND COMPLETION

§ 15.1 APPLICATIONS FOR PAYMENT

§ 15.1.1 Where the Contract is based on a Stipulated Sum or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values, allocating the entire Contract Sum to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used in reviewing the Contractor's Applications for Payment.

§ 15.1.2 With each Application for Payment where the Contract Sum is based upon the Cost of the Work, or the Cost of the Work with a Guaranteed Maximum Price, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner to demonstrate that cash disbursements already made by the Contractor on account of the Cost of the Work equal or exceed (1) progress payments already received by the Contractor, less (2) that portion of those payments attributable to the Contractor's Fee; plus (3) payrolls for the period covered by the present Application for Payment.

§ 15.1.3 Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing.

§ 15.1.4 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or other encumbrances adverse to the Owner's interests.

§ 15.2 CERTIFICATES FOR PAYMENT

§ 15.2.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 15.2.3.

§ 15.2.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluations of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 15.2.3 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 15.2.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 15.2.1. If the Contractor and the Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 9.2.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 15.2.4 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 15.3 PROGRESS PAYMENTS

§ 15.3.1 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to sub-subcontractors in similar manner.

§ 15.3.2 Neither the Owner nor Architect shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 15.3.3 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 15.4 SUBSTANTIAL COMPLETION

§ 15.4.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 15.4.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 15.4.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. When the Architect determines that the Work or designated portion thereof is substantially complete, the Architect will issue a Certificate of Substantial Completion which shall establish the date of Substantial Completion, establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 15.4.4 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 15.5 FINAL COMPLETION AND FINAL PAYMENT

§ 15.5.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions stated in Section 15.5.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 15.5.2 Final payment shall not become due until the Contractor has delivered to the Owner a complete release of all liens arising out of this Contract or receipts in full covering all labor, materials and equipment for which a lien could be filed, or a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including costs and reasonable attorneys' fees.

§ 15.5.3 The making of final payment shall constitute a waiver of claims by the Owner except those arising from

.1 liens, claims, security interests or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents; or

.3 terms of special warranties required by the Contract Documents.

§ 15.5.4 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 16 PROTECTION OF PERSONS AND PROPERTY

§ 16.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons and property and their protection from damage, injury or loss. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, a Subcontractor, a sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 16.1.2 and 16.1.3, except for damage or loss attributable to acts or omissions of the Owner or Architect or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 9.15.

§ 16.2 HAZARDOUS MATERIALS

§ 16.2.1 The Contractor is responsible for compliance with the requirements of the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents, and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shutdown, delay and start-up.

§ 16.2.2 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area, if in fact, the material or substance presents the risk of bodily injury or death as described in Section 16.2.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 16.2.3 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

ARTICLE 17 INSURANCE AND BONDS

§ 17.1 The Contractor shall purchase from, and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, insurance for protection from claims under workers' compensation acts and other employee benefit acts which are applicable, claims for damages because of bodily injury, including death, and claims for damages, other than to the Work itself, to property which may arise out of or result from the Contractor's operations and completed operations under the Contract, whether such operations be by the Contractor or by a Subcontractor or anyone directly or indirectly employed by any of them. This insurance shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater, and shall include contractual liability insurance applicable to the Contractor's obligations under Section 9.15. Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. The Contractor shall cause the commercial liability coverage required by the Contract Documents to include: (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 17.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 17.3 PROPERTY INSURANCE

§ 17.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance on an "all-risk" or equivalent policy form, including builder's risk, in the amount of the initial Contract Sum, plus the value of subsequent modifications and cost of materials supplied and installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 15.5 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 17.3.1 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and sub-subcontractors in the Project.

§ 17.3.2 The Owner shall file a copy of each policy with the Contractor before an exposure to loss may occur. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 17.3.3 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 12, if any, and any of their subcontractors, sub-subcontractors, agents and employees for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to Section 17.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 12, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 17.3.4 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their sub-subcontractors in similar manner.

§ 17.4 PERFORMANCE BOND AND PAYMENT BOND

§ 17.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 17.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 18 CORRECTION OF WORK

§ 18.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense, unless compensable under Section A.2.7.3 in Exhibit A, Determination of the Cost of the Work.

§ 18.2 In addition to the Contractor's obligations under Section 9.4, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 15.4.3, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty.

§ 18.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 8.3.

§ 18.4 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 18.5 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Article 18.

ARTICLE 19 MISCELLANEOUS PROVISIONS

§ 19.1 ASSIGNMENT OF CONTRACT

Neither party to the Contract shall assign the Contract without written consent of the other, except that the Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 19.2 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located, except, that if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 21.4.

§ 19.3 TESTS AND INSPECTIONS

Tests, inspections and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities shall be made at an appropriate time. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until

after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating the costs to the Contractor.

§ 19.4 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 19.4.

ARTICLE 20 TERMINATION OF THE CONTRACT

§ 20.1 TERMINATION BY THE CONTRACTOR

If the Architect fails to certify payment as provided in Section 15.2.1 for a period of 30 days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 4.1.3 for a period of 30 days, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 20.2 TERMINATION BY THE OWNER FOR CAUSE

§ 20.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 20.2.2 When any of the above reasons exists, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may, without prejudice to any other remedy the Owner may have and after giving the Contractor seven days' written notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever reasonable method the Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 20.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 20.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 20.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 20.3 TERMINATION BY THE OWNER FOR CONVENIENCE

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 21 CLAIMS AND DISPUTES

§ 21.1 Claims, disputes and other matters in question arising out of or relating to this Contract, including those alleging an error or omission by the Architect but excluding those arising under Section 16.2, shall be referred initially to the Architect for decision. Such matters, except those waived as provided for in Section 21.8 and Sections 15.5.3 and 15.5.4, shall, after initial decision by the Architect or 30 days after submission of the matter to the Architect, be subject to mediation as a condition precedent to binding dispute resolution.

§ 21.2 If a claim, dispute or other matter in question relates to or is the subject of a mechanic's lien, the party asserting such matter may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 21.3 The parties shall endeavor to resolve their disputes by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with their Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to this Agreement, and filed with the person or entity administering the mediation. The request may be made concurrently with the binding dispute resolution but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 21.4 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any claim, subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association, in accordance with the Construction Industry Arbitration Rules in effect on the date of this Agreement. Demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 21.5 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation; (2) the arbitrations to be consolidated substantially involve common questions of law or fact; and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 21.6 Any party to an arbitration may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim not described in the written Consent.

§ 21.7 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 21.8 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 20. Nothing contained in this Section 21.8 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

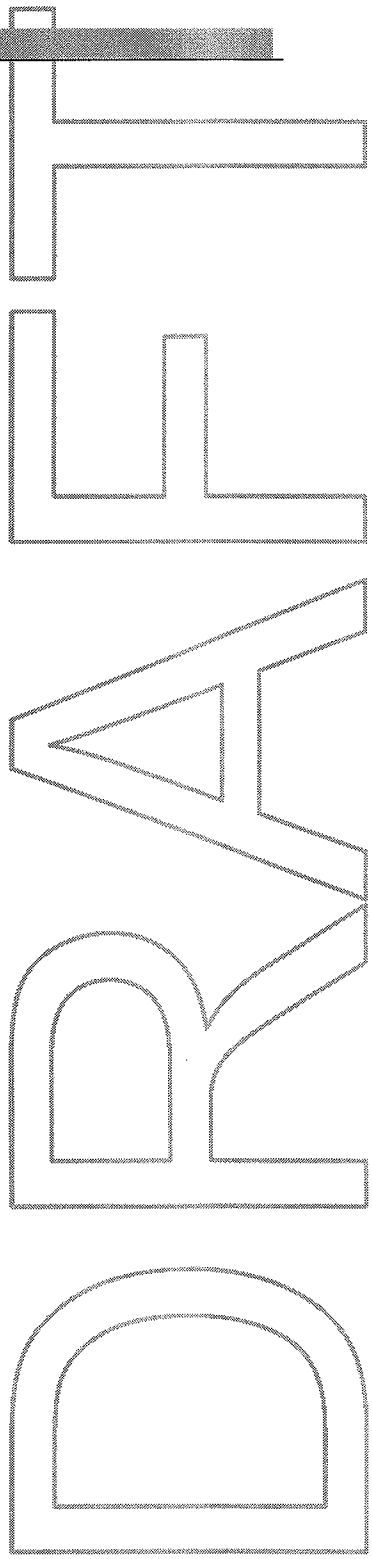
This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)



SECTION 00800

SUPPLEMENTARY CONDITIONS AND ADDITIONAL CONDITIONS

PROJECT: Troy School District
Lighting Replacement
Athens High School,
Boulan Park Middle School and
Larson Middle School
TSD Bid No. 9670
Troy, Michigan

OWNER: Troy School District
4400 Livernois
Troy, MI 48098

ARCHITECT: Integrated Design Solutions, LLC
1441 W. Long Lake, Suite 200
Troy, MI 48098
(248) 823-2100
(248) 823-2200 (Fax)

THE FOLLOWING SUPPLEMENTS MODIFY AIA DOCUMENT A107-2007, " STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION PROJECTS OF LIMITED SCOPE". WHERE A PORTION OF THE GENERAL CONDITIONS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY CONDITIONS, THE UNALTERED PORTIONS OF THE GENERAL CONDITIONS SHALL REMAIN IN EFFECT.

EXPLANATION OF NUMBERING: Article 22 shall constitute revisions and additions to and follow the same format of the General Conditions.

ARTICLE 22

OTHER CONDITIONS OR PROVISIONS

22.1 Add new subparagraph 7.1.1 as follows:

7.1.1 In the case of conflicts or discrepancies between Drawings and the Specifications or within or among the Contract Documents and not clarified by Addendum, the Architect will determine which takes precedence in accordance with Sections 10.7, 10.7.1 and 10.8.

22.2 Add new subparagraph 7.5.3 as follows:

7.5.3 The Contractor will be furnished free of charge six (6) copies of Drawings and Project Manuals for execution of the Work.

22.3 Delete subparagraph 8.1.1 in its entirety.

22.4 Delete subparagraph 9.1.1 and add the following in its place:

9.1.1 The Contractor shall review for compliance with the Contract Documents, approve in writing and submit to the Architect all Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in coordination with the Contractor's construction schedule and in such sequence as to allow the Architect reasonable time for review. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has 1) reviewed and approved them; 2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so; and 3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. At the time of submission, the Contractor shall inform the Architect in writing of any deviation in the Shop Drawings, Product Data and Samples from the requirements of the Contract Documents. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action. The Work shall be in accordance with approved submittals.

22.5 Add new subparagraph 10.7.1 as follows:

10.7.1 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of Drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both the Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

22.6 Delete subparagraph 13.2 and add the following in its place:

13.2 The cost or credit to the Owner resulting from a change in the work shall be determined by mutual agreement, by an acceptable estimate and lump sum proposal by the Contractor, by actual cost of all labor and materials and a percentage or fixed fee for all other changes, such as overhead, profit, insurance, taxes and bonds or in the case of a Construction Change Directive signed only by the Owner and Architect, by the Contractor's cost of labor, material, equipment and reasonable overhead and profit. On any change which involves a net credit to the Owner, no allowance for overhead and profit shall be figured.

13.2.1 If none of the foregoing methods is agreed upon, the Contractor, upon receipt of an order as hereinbefore stated, shall proceed with the work. In such case the Contractor shall keep and present in such form as the Owner may direct, a correct account of the cost, together with vouchers. In any case, the Owner shall certify to the mount including the specified allowance for overhead and profit, due the Contractor.

13.2.2 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule.

1. For the Contractor, for Work performed by the Contractor's own forces 15 percent of the cost.
2. For the contractor, for Work performed by the Contractor's Subcontractors 7-1/2 percent the amount due the Subcontractors.
3. For each Subcontractor involved, for Work performed by that Subcontractor's own forces, 15 percent of the cost.
4. For each Subcontractor involved, for work performed by the Subcontractor's, Sub-subcontractor's 7-1/2 percent of the amount due the Sub-subcontractor.

5. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and Subcontracts. In no case will a change be approved without such itemization.

22.7 Add the following to the end of subparagraph 15.1.1

"The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet."

1. Until final completion, the Owner will pay ninety (90) percent of the amount due the Contractor on account of progress payments. Upon final completion, the Architect will certify payment in full.

22.8 Delete subparagraph 15.1.2 in its entirety.

22.9 Modifications to subparagraph 17.1.
To the end of this subparagraph add the following:

"17.1.1 The insurance required by Subparagraph 17.1 shall be written for not less than the following limits, or greater if required by law:

1. Worker's Compensation:

a.	State:	Statutory
b.	Applicable Federal (e.g. Longshoremen's):	Statutory
c.	Employer's Liability:	$1,000,000.00 per Accident $1,000,000.00 Disease, Policy Limit $1,000,000.00 Disease, Each Employee

2. Comprehensive or Commercial General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage);

a. Bodily Injury:

$1,000,000.00	Each Occurrence
$1,000,000.00	Aggregate

b. Property Damage:

$1,000,000.00	Each Occurrence
$1,000,000.00	Aggregate

c. Products and Completed Operations to be maintained for one (1) year after final payment:

$1,000,000.00	Aggregate

d. Broad Form Property Damage Coverage shall include Completed Operations.

3. Contractual Liability:

   a. Bodily Injury:

$1,000,000.00	Each Occurrence
$1,000,000.00	Aggregate

   b. Property Damage:

$1,000,000.00	Each Occurrence
$1,000,000.00	Aggregate

4. Personal Injury, with Employment Exclusion deleted:

$1,000,000.00	Aggregate

5. Business Auto Liability (including owned, non-owned and hired vehicles):

   a. Bodily Injury:

$1,000,000.00	Each Person
$1,000,000.00	Each Occurrence

   b. Property Damage:

$1,000,000.00	Each Occurrence

6. Umbrella Excess Liability (Bodily Injury and Property Damage Combined) $1,000,000.00

"17.1.2" Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X, C, and U coverages as applicable).
2. Independent Contractor's Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Owned, non-owned and hired motor vehicles.
6. Broad Form Property Damage including Completed Operations.

17.1.3 If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Subparagraph 9.10.2.

22.10 Delete subparagraph 17.4.1and add the following in its place.

"17.4.1 The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds shall be obtained from a company licensed to do business in the State of Michigan and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100 percent of the Contract Sum.

17.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

22.11 Add the following after subparagraph 20.3.

"20.3.1 Upon receipt of written note from the Owner of such termination for the Owner's convenience, the Contractor shall:

1. Cease operations as directed by the Owner in the notice;
2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the work; and
3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing Subcontracts and purchase orders and enter into no further Subcontracts and purchase orders.

22.12 EQUAL OPPORTUNITY

22.12.1. The Contractor shall maintain policies of employment as follows:

22.12.2. The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

22.12.3. The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

END OF SECTION 00800

SECTION 07841 - FIRESTOP SYSTEMS

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:

1. Firestop systems for penetrations through fire-rated constructions.

B. Related Sections include the following:

1. Division 16 Sections specifying cable and conduit penetrations.

1.3 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following fire-rated constructions, provide firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-rating of construction penetrated.

1. Fire-rated walls including fire walls, fire partitions, fire barriers and smoke barriers.
2. Fire-rated horizontal assemblies.

B. Rated Systems: Provide firestop systems with the following ratings determined per ASTM E 814:

1. F-Rated Systems: Provide firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-rating of constructions penetrated.
2. T-Rated Systems: Provide firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

   a. Penetrations located outside wall cavities.
   b. Penetrations located outside fire-rated shaft enclosures.

3. L-Rated Systems: Where firestop systems are indicated in smoke barriers, provide firestop systems with L-ratings of not more than 3.0 cfm/sq. ft at both ambient temperatures and 400 deg F.

C. For firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.

D. For firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each firestop system, show each type of construction penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each firestop system configuration for construction and penetrating items.
2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular firestop condition, submit illustration, with modifications marked, approved by firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-rated assembly.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing firestop systems similar in material, design, and extent to that indicated for this Project.

B. Fire-Test Characteristics: Provide firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, OPL, or ITS, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Firestop systems are those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:

a. Firestop system products bear classification marking of qualified testing and inspecting agency.
b. Firestop systems correspond to those indicated by reference to firestop system designations listed by the following:

1) UL in its "Fire Resistance Directory."
2) OPL in its "Directory of Listed Building Products, Materials, & Assemblies."
3) ITS in its "Directory of Listed Products."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install firestop systems when ambient or substrate temperatures are outside limits permitted by firestop system manufacturers or when substrates are wet.

B. Ventilate firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate firestop systems.

C. Do not cover up firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide firestop systems that are produced by one of the following manufacturers**:**

1. Grace, W. R. & Co. - Conn.
2. Hilti, Inc.
3. Johns Manville.
4. RectorSeal Corporation (The).
5. Specified Technologies Inc.
6. 3M; Fire Protection Products Division.
7. Tremco; Sealant/Weatherproofing Division.

2.2 FIRESTOPPING, GENERAL

A. Compatibility: Provide firestop systems that are compatible with one another; with the substrates forming openings; and with the items penetrating firestop systems.

B. Accessories: Provide components for each firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:

a. Slag-/rock-wool-fiber insulation.

b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
c. Fire-rated form board.
d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.
6. Steel retaining clips.

2.3 FILL MATERIALS

A. General: Provide firestop systems containing the types of fill materials indicated. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.4 MIXING

A. For those products requiring mixing before application, comply with firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestop systems. Remove loose particles remaining from cleaning operation.

B. Priming: Prime substrates where recommended in writing by firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.2 FIRESTOP SYSTEM INSTALLATION

A. General: Install firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.3 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestop systems immediately and install new materials to produce systems complying with specified requirements.

3.4 FIRESTOP SYSTEM SCHEDULE

A. Firestop Systems with No Penetrating Items:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Mortar.

B. Firestop Systems for Metallic Pipes, Conduit, or Tubing:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Mortar.

C. Firestop Systems for Nonmetallic Pipe, Conduit, or Tubing:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.
c. Intumescent putty.
d. Intumescent wrap strips.
e. Firestop device.

D. Firestop Systems for Electrical Cables:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Silicone sealant.

c. Intumescent putty.
d. Silicone foam.

E. Firestop Systems for Insulated Pipes:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Intumescent putty.
c. Silicone foam.
d. Intumescent wrap strips.

F. Firestop Systems for Miscellaneous Electrical Penetrants:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Intumescent putty.
c. Mortar.

G. Firestop Systems for Miscellaneous Mechanical Penetrants:

1. Type of Fill Materials: One or both of the following:

a. Latex sealant.
b. Mortar.

H. Firestop Systems for Groupings of Penetrants:

1. Type of Fill Materials: One or more of the following:

a. Latex sealant.
b. Mortar.
c. Intumescent wrap strips.
d. Firestop device.
e. Intumescent composite sheet.

END OF SECTION 07841

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

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:

1. Acoustical ceiling panels at top of existing acoustical coffered ceiling system after removal of existing lighting fixtures.

B. Related Sections include the following:

1. Division 16 for lighting fixtures.

1.3 DEFINITIONS

A. CAC: Ceiling Attenuation Class.

B. LR: Light Reflectance coefficient.

C. NRC: Noise Reduction Coefficient.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.

1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.

C. Fire Performance Affidavit: Signed by manufacturer of acoustical ceiling panels indicating compliance with specified fire performance requirements.

D. Maintenance Data: For finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

B. Fire-Test Characteristics: Provide acoustical panel ceilings that comply with the following requirements:

1. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

a. Smoke-Developed Index: 450 or less.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: 2 packages of full-size mineral base acoustical panels of each type, color and size installed.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, acoustical ratings, and light reflectances.

B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

2.2 MINERAL-BASE ACOUSTICAL PANELS

A. Mineral-Base Acoustical Panels: Provide acoustical panels complying with the following:

1. Products:

   a. Cirrus No. 533; Armstrong World Industries, Inc.
   b. Cashmere No. CM-497-NRCP; Certainteed.
   c. Eclipse ClimaPlus No. 78575; USG Interiors, Inc.

2. Color: White
3. LR: Not less than 0.82.
4. NRC: Not less than 0.70.
5. CAC: Not less than 35.
6. Humidity Resistance: No visible sag at 90 percent relative humidity, 104 deg F. temperature.
7. Edge Detail: Square
8. Thickness: Not less than 3/4 inch.
9. Size: 24 by 48 inches.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Install acoustical panels with undamaged edges and fit accurately into top of existing coffered ceiling system after removal of existing lighting fixtures.

1. For square-edged panels, install panels with edges fully hidden from view by flanges of coffered suspension system runners and moldings.

3.2 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling panels that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09511

SECTION 09912 - PAINTING

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 surface preparation and field painting of:

1. Existing coffered acoustical ceiling panels (Base Bid).
2. Existing coffered grid system, including grid, air bars diffusers (Alternate).

B. Do not paint speaker cones and wireless internet access points.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
3. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data: For each paint system indicated.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

B. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. On acoustical ceiling panels submit three samples of color and finish.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Individuals experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 PROJECT CONDITIONS

A. Apply paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.

PART 2 - PRODUCTS

2.1 INTERIOR FINISH COATS

A. Interior Flat Acoustical Ceiling Panel Coating: Factory-formulated water-based, Class A fire-rated, non-toxic, specialty coating designed to restore structurally sound ceiling systems. Coating will not warp acoustical panels or allow panels to stick to the grid. Coating may be applied to acoustical ceiling panels and grid system, including air bar diffusers.

1. ProCoustic Acoustical Tile & Ceiling Coating; ProCoat Products, Inc., (781) 767-2270.

2.2 MISCELLANEOUS MATERIALS

A. Acoustical Ceiling Grid Cleaner: Factory-formulated concentrate designed to clean ceiling grid systems including air bar diffusers.

1. ProCoat Hard surface Cleaner (Grid Cleaning Solution); ProCoat Products, Inc., (781) 767-2270.

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Provide surface-applied protection before surface preparation and painting.

B. Cleaning: Before applying paint, clean substrates of substances that could impair bond of the coatings. Remove oil and grease before cleaning.

1. Metal Grid System and Air Bar Diffusers: Clean metal surfaces; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use cleaning solution according to manufacturer's instructions.

C. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

3.2 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, receive a dry film thickness equivalent to that of flat surfaces.
2. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

B. Application Procedures: Apply paints and coatings by roller, spray, or other applicators according to manufacturer's written instructions.

1. Rollers: Use rollers as recommended by manufacturer for material and texture required.
2. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

C. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

3.3 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.4 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09912

SECTION 16010 - ELECTRICAL GENERAL REQUIREMENTS

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 work of this Section.

1.2 SUMMARY

A. This Section includes general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 1 Sections.

1. Design requirements.
2. Performance requirements.
3. Substitutions.
4. Permits and fees.
5. Examination of drawings and premises.
6. Changes involving Electrical Work.
7. Submittals.
8. Project record documents.
9. Operation and maintenance manuals and equipment.
10. Quality assurance.
11. Delivery, storage and handling.
12. Warranty.

B. This Section includes basic requirements for materials and installations for electrical work, including but not limited to:

1. Sealing of openings.
2. Sleeves.
3. Expansion fittings.
4. Nameplates and directories.
5. Electrical demolition work.
6. Cutting and patching.
7. Equipment foundations and supports.
8. Coordination with other trades.
9. Assembly and connection of equipment.
10. Phasing.
11. Field Quality Control.

1.3 REFERENCES

A. The electrical and physical properties of all materials, and the design, performance characteristics, and methods of construction of all items of equipment, shall be in accordance with the latest issue of the various, applicable Standard Specifications of the following recognized authorities:

1. ANSI - American National Standards Institute
2. ASTM - American Society for Testing Materials

3. BICSI - Building Industry Consulting Service International
4. FCC - Federal Communication Commission
5. ICEA - Insulated Cable Engineers Association
6. IEEE - Institute of Electrical and Electronics Engineers
7. NEC - National Electrical Code
8. NETA – International Electrical Testing Association
9. NEMA - National Electrical Manufacturer's Association
10. NFPA - National Fire Protection Association
11. UL - Underwriters' Laboratories, Inc.

1.4 SYSTEM DESCRIPTION

A. Design Requirements: Furnish all labor, materials, equipment, technical supervision, and incidental services required to complete, test and leave ready for operation the electrical systems as specified in the Division 16 Sections and as indicated on Drawings.

1. The Electrical Drawings indicate the general design and extent of the electrical system. Comply to the Drawings as closely as actual construction of the building and the work of other Trades permit.

B. Performance Requirements: Perform all work in a first class and workmanlike manner, in accordance with the latest accepted standards and practices for the Trades involved.

1. All equipment of the same or similar systems shall be by the same manufacturer.

C. Substitutions: Base Bid must be in accordance with materials or products specified. Any exceptions to this must be approved in writing by the Architect/Engineer ten (10) days or more prior to bidding.

1. Voluntary alternates may be submitted for consideration, with listed addition or deduction to the Bid, but will not affect the awarding of the Contract.

D. Permits and Fees: Obtain all permits, licenses, inspections and test required. Upon completion of the Work, obtain and send certificates of inspections and approvals to the Architect/Engineer.

1. Pay all fees and expenses for permits, licenses, tests and inspections.

E. Examination of Drawings and Premises: Before submitting Bids, examine the site, architectural, mechanical and other trades' drawings and specifications.

1. Notify Architect/Engineer should any discrepancies occur between them and the electrical work.
2. No additional charges will be allowed because of failure to make this examination, or to include all materials and labor required for the Work.
3. Before submitting Bids, examine the premises to determine existing conditions for performing the Work. No additional charges will be allowed because of failure to make this examination or to include all materials and labor to complete the Work.

4. The Architectural Drawings take precedence in all matters pertaining to the building structure, Mechanical drawings in all matters pertaining to Mechanical trades and Electrical drawings in all matters pertaining to Electrical trades installation. However, where there are conflicts or differences between the Drawings for the various trades, report such conflicts or differences to the Architect/Engineer who shall determine the course of action to be taken.

F. Changes Involving Electrical Work: The design of the electrical systems is based on the mechanical and building equipment specified and scheduled on the Drawings.

1. Where equipment changes are made that involve additional electrical work (increased motor horsepower or increased unit full load amperes, requirements for a disconnect switch scheduled to be part of the equipment, requirements for a starter scheduled to be part of the equipment, additional wiring of equipment, etc.) the Mechanical or respective trades involved shall compensate the electrical trades for the cost of the additional work required.

1.5 SUBMITTALS

A. The following is in addition to the requirements for submittals in Division 1.

B. Material List: Submit a complete list of all materials, equipment, and their manufacturers, for approval by the Architect/Engineer within 15 days after award of contract and prior to submittal of shop drawings.

C. Provide equipment submittals in the form of letters of intent, product data catalog sheets or shop drawings as hereinafter specified for all materials provided on the project.

D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 5" on the label or beside the title block on shop drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

a. Project Name
b. Date
c. Name and address of Architect/Engineer
d. Name and address of Contractor
e. Name and address of Subcontractor
f. Name and address of Supplier
g. Name of Manufacturer
h. Number and title of appropriate Specification Section
i. Drawing number, identification mark, fixture type, panelboard number, specification section number, and detail references, or as noted on the electrical drawings.

E. Equipment submittals shall be reviewed by the Electrical Contractor for completeness and accuracy and prior to submitting to the Architect/Engineer for review. Submittals shall be dated and signed by the Electrical Contractor.

F. Partial submittals for equipment shall not be permitted. Where partial submittals are transmitted to the Architect/Engineer, they will be returned "Rejected".

G. Where the equipment submittals consist of manufacturer's standard detail drawing or schedules and contain data for a variety of similar equipment, indicate the data pertinent to the equipment furnished for this project only. Standard detail drawings and schedules not clearly indicating which data is associated with this Project shall be returned "Rejected".

H. Where accessories and/or options are specified and do not appear as part of manufacturer's standard detail drawings, state each accessory that is to be provided with the equipment on the standard detail drawings.

I. Letter of Intent shall state that the product is exactly as specified with no exceptions, and that the product is being manufactured by one of the specified manufacturers. The Letter of Intent shall include the specification section number, the product description, the name of the selected manufacturer and the catalog number of the product. The aforementioned information shall be typed on the Electrical Contractor's letterhead and submitted with one (1) product data sheet for each product itemized in the Letter of Intent for record.

J. Lighting fixture submittals shall be submitted as one (1) package including all fixtures intended to be used for this Project.

K. Shop Drawings: Prepare layout shop drawings drawn to scale in electronic format and submit one (1) transparency copy and two (2) prints of each to the Architect/Engineer for review, together with required number of additional copies as required by the General Conditions. Electronic copies of the electrical bid set of drawings and as referred to as the Contract Documents will be furnished for this purpose. After the shop drawings are reviewed, the transparency copy will be stamped and returned for printing and distribution. Refer to Division 1 for submittals and quantities. Refer to Division 1 for the forms and procedures for requesting electronic files/media.

1. Layout shop drawings shall show building floor plans to scale and shall include lighting and power distribution systems, all details of electrical construction, routing of conduits, wiring, circuiting and related information necessary for the installation and future maintenance of the electrical wiring systems.

L. No apparatus or equipment shall be shipped from stock or fabricated until equipment submittals for them have been reviewed and approved by the Architect/Engineer. By the review of shop drawings, the Architect/Engineer does not assume responsibility for actual dimensions or for the fit of completed work in position, nor does such review relieve Electrical Trades of full responsibility for the proper and correct execution of the work required.

M. Submittals shall be provided on all major electrical systems and/or equipment, including the following:

REMARKS LEGEND
In addition to the previously specified, provide the following where indicated:

1. Factory Test Report
2. Field Testing Report
3. Record Drawings
4. Mock-Up
5. Material & Equip. List/Certificate
6. Operation & Maintenance Manuals
7. Construction Schedule
8. Points List
9. Sequence of Operation
10. Certificate of Inspection
11. Installer Certificate & Master Label
12. Fire Marshal Approval
13. Tools/Spare Parts
14. _____

Section Number	Section Title	Shop Dwgs.	Product Data	Letter of Intent	Samples	Warranty	Remarks
16010	General Requirements					X	6, 7, 10
	Layout Shop Drawings	X					3, 5, 13
	Materials List			X			5
16025	Electrical Systems						
16060	Grounding						
	Grounding Cable			X			
	Grounding Connections/fittings			X			
16080	Electrical Testing						
	Testing Firm			X			
	Tests on 600 Volt Cables						2
	Tests on Grounding						2
16120	Conductors and Cables (0-600V)						
	Cable			X			1
	Splicing Connectors			X			
	Termination Lugs			X			
16130	Raceways and Boxes						
	RGS Conduit and Fittings			X			
	EMT Conduit and Fittings			X			
	Flexible Steel Conduit and Fittings			X			
	Liquid-Tite Flexible Steel Conduit and Fittings			X			
	Outlet Boxes			X			
	Pull Boxes			X			
	Wireways		X				
16190	Supporting Devices			X			
16195	Electrical Identification			X			

Section Number	Section Title	Shop Dwgs.	Product Data	Letter of Intent	Samples	Warranty	Remarks
16570	Lighting Control System	X	X				1, 2, 9, 13

1.6 PROJECT RECORD DOCUMENTS

A. Project Record Documents: Revise layout shop drawings as required during construction to indicate the as-built condition.

1. At the completion of the Project, resubmit to the Owner's Representative the revised sepias, or electronic files and one set of prints indicating "as-built" conditions for Owner's record. The Drawings shall contain all title block information as originally issued by the Architect/Engineer with the addition of the electrical contractor's company name, address, telephone number, company's project number, date of issuance by the electrical contractor, and issued for "as-built" conditions in title.
2. Furnish and deliver to the Owner's Representative a manual of all shop drawings and product data upon substantial completion. The manual shall consist of a standard hard cardboard, vinyl covered, 3-ring binder, letterhead size, 8-1/2" x 11". Shop drawings shall be folded and punched. All items and pages shall be numbered with typewritten index inserted at front of manual.
3. Submit final project record documents as described in Division 1.

1.7 OPERATION AND MAINTENANCE MANUALS AND EQUIPMENT

A. Operation and Maintenance Manuals: The manuals shall contain operating instructions, service instructions, parts lists, etc., which are shipped with electrical equipment. On completion of the work, transmit these items to the Architect/Engineer, for the Owner's use. If this information is not shipped with the equipment, obtain from the manufacturer.

B. Maintenance Materials: Retain all portable and detachable portions of the installation such as keys, tools, manuals, etc., until the completion of the work and then transmit them to the Owner and obtain itemized receipt. This receipt shall be attached to the "Final Application" for payment.

C. Furnish three (3) sets of bound operation and maintenance manuals to the Architect/Engineer. Each set shall include:

1. One (1) copy of all shop drawings.
2. Operation and maintenance instructions and manuals.
3. One (1) copy of all electrical testing.
4. As-built drawings.

1.8 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Ordinances and Codes: Perform all work in accordance with applicable Federal, State and local ordinances and regulations, the Rules and Regulations of the National Board of Fire Underwriters, the National Electric Code, and the latest accepted practices of IEEE and NEMA.

   a. Notify the Architect/Engineer before submitting his proposal should any changes in Drawings or Specifications be required to conform to the above codes, rules or regulations. After entering into Contract, make all changes required to conform to above ordinances, rules and regulations without additional expense to the Owner.
   b. Barrier-Free Regulations: All materials and installations shall comply with the requirements of the State of Michigan Handicapped Barrier-Free Regulations and with the Americans with Disabilities Act (ADA).

B. Field Measurements:

1. Drawings are not intended to be scaled for roughing-in or to serve as shop drawings. Take all field measurements required for fitting the installation to the building.

C. Sequencing and Scheduling: Sequence and schedule work so as to avoid interference with the work of other Trades. Be responsible for removing and relocating any work which in the opinion of the Owner's Representatives causes interference.

1.9 DELIVERY, STORAGE AND HANDLING

A. Storage and Protection: Provide adequate storage space for all electrical equipment, conduit and materials delivered to the job site under a weather protected enclosure. Location of the space will be designated by the Owner's Field Representative. Equipment set in place in unprotected areas must be provided with temporary protection.

1. Be responsible for the care and protection of electrical equipment until it has been fully tested and accepted.
2. Protect materials with permanent factory finish from damage by covering.
3. Protect conduit openings with temporary plugs or caps.

1.10 WARRANTY

A. Warranty: Provide a one year parts and labor warranty for all equipment and installation. Comply with requirements of the General Conditions.

PART 2 - PRODUCTS

2.1 SEALING OF OPENINGS

A. Seal openings around electrical materials (Conduit, raceways, cable trays, panels, etc.) where floors, fire rated walls and smoke barriers are penetrated. (Fiberglass is not acceptable.) Fire and/or smoke barriers shall be UL Listed fire and smoke stop fittings and shall have fire rating equal to or greater than the penetrated barrier. Refer to Section 07841 "Through Penetration Firestop Systems".

2.2 SLEEVES

A. Provide conduit sleeves where conduits pass through concrete floors, walls, beams and ceilings.

B. Sleeves shall be galvanized rigid steel conduit. Do not use aluminum conduit. Where specific sizes are not indicated on the Drawings, sleeves shall be sized to provide one-half (1/2) inch clearance around the outside surface of the item for which they were installed. They shall be cut flush with wall surfaces, and shall extend one inch, or as directed through floor. Sleeves shall be packed with approved non-combustible packing material and sealed with sealant to prevent passage of air, liquid or fumes from one area to another. The filler and sealant materials used shall be rated at least equal in fire resistance to the construction material being penetrated. Floor sleeves shall be sealed between floor and sleeve with concrete grout.

2.3 EXPANSION FITTINGS

A. Provide expansion fittings in all conduits, cable trays, and feeder bus duct runs that cross building expansion joints, both in concrete slabs and where exposed.

2.4 NAMEPLATES AND DIRECTORIES

A. Identify switchgear, unit substations, motor controls, panelboards, safety switches, etc., with manufacturers' nameplate, shop order, where applicable on composite assemblies, and designations used on the Drawings. Nameplates shall be laminated phenolic plastic, beveled edged white with engraved black letters. Except where impractical, letters and numerals shall be a minimum of 1/2 inch high. Nameplates shall be mechanically secured. Pressure sensitive nameplates are not acceptable. Panel directories shall be typed, showing equipment served and location for each breaker or switch with a clear plastic protective cover. Provide new typed, updated panel directories at all existing panels affected by the scope of the project. Ring out all existing branch circuits as required to update the existing panel directories.

PART 3 - EXECUTION

3.1 ELECTRICAL DEMOLITION WORK

A. General: Perform electrical demolition work in a systematic manner. Use such methods as outlined below to complete Work indicated on the Drawings.

B. Obtain approval from the Owner prior to interrupting existing services. All service interruptions shall be at a time suitable to the Owner. Where the Owner approves service interruptions at times resulting in premium time work to this Contractor, this Contractor shall include the premium time in his Base Bid.

C. The associated conduit, wire, junction boxes, supports, etc., of demolished equipment shall be removed from the utilization equipment back to the source panel and the associated circuit breaker or fused switch shall be relabeled as "spare", unless otherwise noted. All associated wiring shall be removed back to the "sources" as noted below:

1. Power: Remove conduit and wire back to the panel. When the circuit continues on to the other existing loads remove conduit and wire back to the first junction box.
2. Conduit in walls to remain: Abandon in place. Install blank coverplates.
3. Conduit accessible above ceilings and/or other location: Remove conduit.

D. Ring out circuits prior to deactivating feeders and branch circuits to insure maintaining electrical power in adjacent unrenovated area. Where removal of conduit and wire affects "downstream" circuits, refeed downstream circuits.

E. Conduit in floor slabs shall be cut 1/2 inch below the floor and patched.

F. Where applicable, existing in-place conduit may be reused for new work providing that the installation is in accordance requirements for new work found in Section 16000.

G. Where equipment or fixtures are removed, outlets shall be properly blanked-off, and conduits capped. After alterations are completed, the entire installation shall present a "finished" look, as approved by the Architect/Engineer. The original function of the present electrical work to be modified shall not be changed unless required by the specific revisions to the system as specified or as indicated.

H. Materials salvaged from this work shall not be reused except where reuse is specifically indicated.

I. Existing fixtures and electrical equipment removed, not reused and not specifically indicated to be turned over to the Owner, shall be legally and properly disposed of off Owner's property.

J. Existing fixtures and electrical equipment specifically indicated to be turned over to the Owner shall be disconnected, removed and turned over to the Owner in an undamaged condition to an on sight storage area as directed by the Owner.

3.2 CUTTING AND PATCHING

A. Refer to Division 1 for requirements for cutting, patching and refinishing work necessary for the installation of Electrical Work.

B. Direct miscellaneous cutting and patching of the existing building construction for the installation of the Electrical Work.

C. The cutting of holes through the existing building construction shall only be done by the use of abrasive saws and rotary coring machines. The use or hammer and drill points will not be permitted. The openings shall not be cut larger than necessary for the installation of the electrical work. Openings shall then be grouted in. Where existing piping, etc. is removed, the unused openings shall be grouted in.

D. The drilling or punching of structural members, such as holes through beams or columns, shall not be done without the specific permission of the Architect/Engineer.

E. Cutting of holes through floors and walls shall be done only at such locations as may be directed by the Architect/Engineer.

F. Cooperate with the other Contractors so that all cutting and repairing in any given area will be done simultaneously.

G. Electrical work which may interfere with changes in piping, ducts or other mechanical equipment, as well as conduits and outlets that may be uncovered by the cutting of new openings in present building, shall be removed at the direction of the Architect/Engineer.

3.3 EQUIPMENT FOUNDATIONS AND SUPPORTS

A. Furnish foundations and supports for electrical equipment and materials as required by codes, as listed hereinafter and shown or noted on the Drawings.

B. Provide necessary inserts, rod, structural steel frames, brackets, platforms, etc., for equipment suspended from ceilings or walls, such as conduits, transformers, panels, etc.

C. Inserts for equipment support shall be lead shield anchors for small work and expansion shields for large work. Wooden plugs will not be allowed. Do not use metal roof decking and cellular floors for supporting equipment.

D. Provide and install concrete bases 4" above finished floor, with leveling channels, where noted, for floor-mounted equipment such as unit substations, transformers, switchboards, distribution panels, motor control centers, etc.

3.4 COORDINATION WITH OTHER TRADES

A. Install Work so as to avoid interferences with the Work of other trades. Be responsible for removing and relocating any work which, in the opinion of the Owner's Representative, causes interferences.

B. Should construction conditions prevent the installation of switches, conduit, outlet boxes, junction boxes, conductors, lighting fixtures and/or other related equipment at locations shown on the drawings, minor deviations may be permitted and shall be as directed by the Architect/Engineer, and shall be made without additional cost to Owner.

C. The Electrical Trades will be responsible for all damage to other Work caused by their Work or through the neglect of their workers.

1. All patching and repairing of any such damaged Work shall be performed by the trades which installed the Work, but the cost shall be paid by the Electrical Trades.

3.5 ASSEMBLY AND CONNECTION OF EQUIPMENT

A. Assembly of Equipment:

1. The Contract Drawings and Specifications indicate items to be purchased and installed which are noted by a manufacturer's name, catalog number and/or brief description.
2. The catalog number may not designate all the accessory parts and appurtenances required for the particular use or function.

3. Arrange with the manufacturer for the purchase of all items required for the complete installation and efficient operation.

B. Equipment Connections:

1. Connections to equipment, motors, elevator controllers, lighting fixtures, etc., shall be made in accordance with the shop drawings and rough-in measurements furnished by the manufacturers of the particular equipment furnished.
2. Any and all additional connections not shown on the Drawings but called for by the equipment manufacturer's shop drawings or required for the successful operation of the particular equipment furnished shall be installed as part of this Contract at no additional charge to the Owner.

3.6 PHASING

A. Identify general power and lighting feeder and branch circuits with a visual color code as an integral part of the outer jacket or as a printed color coding the entire length of the insulation in accordance with the NEC.

3.7 FIELD QUALITY CONTROL

A. Testing Ducts and Conduits: Ducts and conduits which are installed underground or concealed in concrete floor slab, foundations, etc., shall be cleared of foreign material and obstructions after installation and before conductor or pullwires are draw-in, by wire brushing, swabbing and employing an iron or hardwood mandrel which is 1/4" smaller in diameter than the internal diameter of the duct or conduit. Pulling wires shall be left in empty conduits.

B. Tests and Inspection:

1. When the systems are completed, operate equipment as directed by Architect/Engineer. Replace all faulty equipment. Make necessary adjustments before final acceptance.
2. Tests shall include but not be limited to panels, lighting fixtures, receptacles, fire alarm system, generator transfer, sound systems, emergency lighting, branch circuits, etc.
3. Perform all tests required by State, City, County and/or other agencies having jurisdiction.
4. Provide all materials, equipment, etc., and labor required for tests.

C. Cleaning:

1. Keep premises free from accumulation of waste materials and rubbish. At completion of work remove all rubbish from and about the building and leave the electrical systems clean and ready for use.
2. Final clean-up shall include washing of fixture lenses, switchboards, substations, transformers, motor control centers, distribution panels, lighting panels, etc., to remove shipping and/or construction dust and debris. Fixture reflectors and/or lenses with water marks or cleaning streaks will not be accepted.

D. Painting:

1. In general, no painting is required by Electrical Trades other than touch-up of factory-finished electrical equipment.

2. All factory finished electrical equipment shall be cleaned at completion of the job. Equipment showing rust or mars shall be thoroughly cleaned and sanded, prime coated and touched up with enamel of color to match original finish.

END OF SECTION 16010

SECTION 16025 – ELECTRICAL SYSTEMS

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 work of this Section.

1.2 SUMMARY

A. Description of Systems at Athens High School:

1. Lighting Systems: 480/277 volt, 3 phase, 4 wire, 60 hertz, solidly grounded neutral.
2. Emergency Lighting Systems: 480/277 volt, 3 phase, 4 wire, 60 hertz, solidly grounded neutral.

B. Description of Systems at Boulan Park and Larson Middle Schools:

1. Lighting Systems: 480/277 volt, 3 phase, 4 wire, 60 hertz, solidly grounded neutral.
2. Emergency Lighting Systems: Battery Operated.

1.3 WORK SPECIFIED IN DIVISION 16 SECTIONS

A. Furnish all labor, materials, equipment, technical supervision, and incidental services required to complete, test and leave ready for operation the electrical systems as specified in the Division 16 Sections.

B. The principal items of electrical work to be furnished and installed shall include but not necessarily be limited to the following items:

1. A 480/277 volt, 3 phase, 4 wire building lighting distribution system, including lighting control panels, feeder and branch circuit wiring and all connections complete.
2. A complete building lighting system including fixtures, ballasts, lamps, controls, etc.
3. An emergency lighting system (egress lighting) consisting of selected general area lighting fixtures connected to the emergency power system.
4. A battery-operated emergency lighting system for egress.
5. Wiring devices including switches, plates, etc.
6. Branch circuit wiring to all building wiring devices, including switches, lighting and equipment.
7. Testing of cables and electrical equipment.
8. All items incidental to and/or required to complete the installation.

PART 2 - PRODUCTS

See specific sections for requirements.

PART 3 - EXECUTION

See specific sections for requirements.

END OF SECTION 16025

SECTION 16060 - GROUNDING

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 work of this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Grounding Conductors:

a. For General Use Above and Below Grade: Bare.
b. In Conduit with Phase Conductors: Insulated.

2. Grounding Connections:

a. To Non-Permanently Fixed Equipment: Lugs bolted to the equipment.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Ground electrical system neutrals and non-current carrying parts of electrical equipment per the minimum requirements of the National Electrical Code, except where additional requirements are indicated or specified.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Submit shop drawings and complete product data on each item. Coordinate the items, as they relate to the work, prior to submittal. Shop drawings shall include:

1. Ground cables
2. Grounding connections and fittings

PART 2 - PRODUCTS

2.1 GROUNDING CONDUCTORS

A. Bare Grounding Conductors: stranded annealed copper.

B. Insulated Grounding Conductors: stranded annealed copper insulated with a heat and moisture resistant polyvinyl chloride compound and meeting UL Requirements for Type (THWN) (XHHW), 75 degC, rated 600 volts, color-coded green. Conductor No. 10 AWG and smaller may be solid in lieu of stranded. Refer to Section 16120 for manufacturers.

2.2 GROUNDING CONNECTIONS

A. Copper Compression Grounding

1. Manufacturer: Provide products of one of the following:

a. Anderson
b. Burndy
c. Ilsco
d. Panduit
e. Penn Union
f. Thomas & Betts

B. Grounding Fittings for Bonding a Ground Conductor to Its Own Conduit.

1. Manufacturer: Provide products of one of the following:

a. Appleton Type GIB
b. Burndy Type NE
c. Penn Union Type BD
d. O-Z Type GB
e. Thomas & Betts Type TIG or 3800 Series

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install conductors of size required by the NEC. except that where sizes are otherwise indicated, provide these sizes.

B. Thoroughly clean all bonding surfaces of non-conducting materials. Where bolted connections are used, treat surfaces with a corrosion-inhibiting compound.

C. Where insulated conductors are used, thoroughly tape all exposed splices and connections. Encapsulate below grade splices and connections so that bare conductors are not in contact with earth.

D. Where metallic conduit is used for mechanical protection of a ground conductor, bond conductor to the conduit at each end.

E. Where non-metallic conduit is used, install a ground conductor in the conduit with the circuit conductors. The ground conductor may be a separate conductor, a conductor of a multi-conductor cable, or wires in the interstices of cabled circuit conductors. Size the ground conductors per NEC requirements except where noted otherwise.

F. Lighting branch circuits in EMT or flexible conduit and lighting fixture cord and plug assemblies shall have an equipment grounding conductor.

G. Provide an equipment grounding conductor, within the raceway along with phase conductors, for all feeders and branch circuits.

H. Provide an equipment grounding conductor within all flexible conduits.

I. The metallic enclosures and exposed noncurrent-carrying metal parts of all electrical equipment shall be grounded by connection with an equipment grounding conductor. This includes boxes, panels, lighting fixtures, ballasts and poles, receptacles, etc.

END OF SECTION 16060

SECTION 16080 - ELECTRICAL TESTING

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 work of this section.

1.2 SUMMARY

A. General Scope:

1. Engage the services of a recognized independent testing firm for the purpose of performing inspections and tests as herein specified. Where this contractor has the qualifications and capabilities of providing these services, it shall be so stated prior to award of contract.
2. The testing firm shall provide all material, equipment, labor, and technical supervision to perform such tests and inspections.
3. It is the intent of these tests to assure that all electrical equipment, both contractor and owner supplied, is operational and within industry and manufacturer's tolerances and is installed in accordance with design specifications.
4. The tests and inspections shall determine suitability for energization.

B. Applicable Codes, Standards and References

1. All inspections and tests shall be in accordance with the following applicable codes and standards except as provided otherwise herein.

a. American National Standards Institute - ANSI

1) ANSI C2: National Electrical Safety Code
2) ANSI Z244-1: American National Standard for Personnel Protection

b. American Society for Testing and Materials - ASTM
c. Association of Edison Illuminating Companies - AEIC
d. Electrical Apparatus Service Association - EASA
e. Institute of Electrical and Electronic Engineers - IEEE
f. Insulated Cable Engineers Association - ICEA
g. International Electrical Testing Association - NETA
h. National Electrical Manufacturer's Association - NEMA
i. National Electrical Code - NEC
j. National Fire Protection Association - NFPA

1) ANSI/NFPA 70B: Electrical Equipment Maintenance
2) NFPA 70E: Electrical Safety Requirements for Employee Workplaces
3) ANSI/NFPA 70: National Electrical Code
4) ANSI/NFPA 78: Lightning Protection Code
5) ANSI/NFPA 101: Life Safety Code

k. Occupational Safety and Health Administration - OSHA

1) OSHA Part 1910; Subpart S, 1910.308
2) OSHA Part 1926; Subpart V, 1926.950 through 1926.960

l. Underwriters Laboratories, Inc. - UL
m. State and Local Codes and Ordinances

2. All inspections and tests shall utilize the following references:

a. Project Design Specifications.
b. Project Design Drawings.
c. Manufacturer's instruction manuals applicable to each particular apparatus.

C. Qualifications of Testing Agency:

1. The testing firm shall be a corporately independent testing organization which can function as an unbiased testing authority, professionally independent of the manufacturers, suppliers, and installers of equipment or systems evaluated by the testing firm.
2. The testing firm shall be regularly engaged in the testing of electrical equipment devices, installations, and systems.
3. The testing firm shall have been engaged in such practices for a minimum of five years.
4. The testing firm shall meet Federal OSHA criteria for accreditation of testing laboratories, Title 29, Parts 2907, 1910, and 1936. Full membership in the InterNational Electrical Testing Association constitutes proof of such criteria.
5. The lead, on site, technical person shall be currently certified by the InterNational Electrical Testing Association (NETA) in Electrical Power Distribution System Testing.
6. Testing firm shall utilize only full-time technicians who are regularly employed by the firm for testing services. Electrically unskilled employees are not permitted to perform testing or assistance of any kind. Electricians and/or linemen may assist, but may not perform testing and/or inspection services.
7. The testing firm shall submit proof of the above qualifications with bid documents when requested.
8. The testing firm shall be an independent organization as defined by OSHA Title 29, Part 1936 and the InterNational Electrical Testing Association.
9. All instruments used by the testing firm to evaluate electrical performance shall meet NETA's Specifications for Test Instruments.
10. The terms used herewithin such as Test Agency, Test Contractor, Testing Laboratory, or Contractor Test Company, shall be construed to mean testing firm.

D. Division of Responsibility:

1. The Electrical Contractor shall perform routine insulation resistance, continuity and rotation tests for all distribution and utilization equipment prior to and in addition to tests performed by the testing firm specified herein.
2. The Electrical Contractor shall supply a suitable and stable source of electrical power to each test site. The testing firm shall specify the specific power requirements.
3. The Electrical Contractor shall notify the testing firm when equipment becomes available for acceptance tests. Work shall be coordinated to expedite project scheduling.
4. The Electrical Contractor shall have a short circuit analysis and coordination study prepared by an independent testing firm or consulting engineering firm and have said study approved by the A/E project electrical engineer eight (8) weeks prior to commencing any testing.
5. The testing firm shall notify the engineer prior to commencement of any testing.

6. Any system, material or workmanship which is found defective on the basis of acceptance tests shall be reported.
7. The testing firm shall maintain a written record of all tests and upon completion of project, assemble and certify a final test report.

E. Electrical Tests: Furnish all labor, materials, test equipment, and technical supervision to perform and record the electrical tests as specified, and perform and record all electrical tests as required, including tests on:

1. Tests on Cables, Low Voltage (600V Maximum)
2. Grounding Systems

F. Preliminary inspections and tests:

1. Visual inspections of electrical equipment, wire checks of factory wiring and any other preliminary work required to prevent delays during performance of electrical acceptance tests.

G. Electrical acceptance tests:

1. Those inspections and tests required to show that the workmanship, methods, inspections, and materials used in erection and installation of the electrical equipment conforms to accepted engineering practices, IEEE Standards, IPCEA-NEMA Standards, the National Electrical Code, manufacturers instructions, and Division 16 Sections, and to determine that the equipment involved may be energized for operational tests.

H. Operating tests:

1. Those tests performed on all electrical equipment installed under Division 16 Sections, and under other Sections, to show that the electrical equipment will perform the functions for which it was designed.

1.3 RELATED WORK SPECIFIED IN OTHER SECTIONS

A. Refer to Section 16025, "Electrical Systems".

B. Operating tests on mechanical and electrical equipment installed under other Sections to prove capability of such equipment to perform as specified in the Section covering specific equipment.

C. Repair or replacement of equipment installed under other Sections and not meeting acceptance tests specified in this Section and therefore not acceptable.

D. Uncoupling of motors installed under other Sections where reverse rotation could damage equipment during acceptance tests for proper rotation.

1.4 PERFORMANCE REQUIREMENTS

A. Final acceptance of electrical equipment will not only depend on equipment integrity as determined by the electrical acceptance test, but will also depend on complete operational tests, whether performed under this or other Sections.

1.5 SUBMITTALS

A. Test Reports:

1. The test report shall include the following:

   a. Project Name: Obtain from project manual.
   b. A/E Firm: Integrated Design Solutions, LLC
   c. A/E Address: 1441 W. Long Lake, Suite 200, Troy, MI 48098
   d. A/E Project Number: Obtain from project manual.
   e. Name of testing organization.
   f. Address of testing organization.
   g. Name of individual performing tests.
   h. Description of tests.
   i. Test data.
   j. Analysis and recommendations.
   k. Description of equipment tested and its number/name.
   l. Humidity, temperature, and other conditions that may affect the results of the tests and/or calibrations.
   m. Date of inspections, tests, maintenance, and/or calibrations.
   n. Identification of the testing technician.
   o. Indication of inspections, tests, maintenance, and/or calibrations to be performed and recorded.
   p. Indication of expected results when calibrations are to be performed.
   q. Indication of "as-found" and "as-left" results, as applicable.
   r. Sufficient spaces to allow all results and comments to be indicated.

2. Submit test reports, including complete data on actual readings taken and corrected values, to the Architect/Engineer for approval after each test period. Have all test reports signed by the authorized witnesses present at tests prior to submission. Do not energize any equipment or material for operating tests until test data has been approved.

B. Submit five (5) copies of final approved test reports to the Owner at the completion of the work under this Section.

C. Submit five (5) copies of the short circuit and protective device coordination study.

1.6 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Do not perform megger or high potential tests during times of high relative humidity.
2. Do not perform tests on outdoor equipment during inclement weather. Do not perform tests on direct burial bare ground conductors or on ground rods within a 48 hour period following rainfall.

B. Safety Precautions:

1. All parties involved shall be cognizant of applicable safety procedures. This document does not include any procedures, including specific safety procedures. It shall be understood and clear that an overwhelming majority of the tests and inspections recommended in these specifications are potentially hazardous. Individuals performing these tests shall be trained and capable of conducting these tests in a safe manner and with complete knowledge of the hazards involved. Safety practices shall include, but are not limited to, the following requirements:

    a. All applicable provisions of the Occupational Safety and health Act, particularly OSHA 29CFR 1910.
    b. Accident Prevention Manual for Industrial Operations, National Safety Council.
    c. Applicable state and local safety operating procedures.
    d. Owner's safety practices.
    e. ANSI/NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces.

2. A safety lead person shall be identified prior to commencement of work.
3. A safety briefing shall be conducted prior to the commencement of work.
4. All tests shall be performed with the apparatus de-energized and grounded except where otherwise specifically required to be ungrounded or energized for certain tests.
5. The testing organization shall have a designated safety representative on the project to supervise operations with respect to safety.
6. During cable tests, station a person at each point where cable has exposed connections. Supply each person with a two-way communication device.

C. Suitability of Test Equipment:

1. All test equipment shall meet the calibration requirements found in these specifications and shall be in good mechanical and electrical condition.
2. Field test metering used to check power system meter calibration shall be more accurate than the instrument being tested.
3. Accuracy of metering in test equipment shall be appropriate for the test being performed.
4. Waveshape and frequency of test equipment output waveforms shall be appropriate for the test and the tested equipment.

D. Test Instrument Calibration:

1. The testing organization shall have a calibration program which assures that all applicable test instruments are maintained within rated accuracy for each test instrument calibrated.
2. The firm providing calibration service shall maintain up-to-date instrument calibration instructions and procedures for each test instrument calibrated.
3. The accuracy shall be directly traceable to the National Institute of Standards and Technology (NIST).
4. Instruments shall be calibrated in accordance with the following frequency schedule:

    a. Field instruments: Analog, 6 months maximum. Digital, 12 months maximum.
    b. Laboratory instruments: 12 months maximum.
    c. Leased specialty equipment: 12 months maximum.

5. Dated calibration labels shall be visible on all test equipment.

6. Records, which show date and results of instruments calibrated or tested, must be kept up to date.
7. Calibrating standard shall be of better accuracy than that of the instrument tested.

1.7 SEQUENCE AND SCHEDULING

A. Perform all acceptance and operating tests in the presence of the Architect/Engineer.

B. Schedule sequence of tests so that equipment can be energized immediately after completion of the applicable tests and approval of test reports. Notify the Architect/Engineer of time of test at least 48 hours prior to testing.

C. Notify vendors and manufacturers of electrical equipment of the time of tests and extend reasonable cooperation to them or their representatives to permit them to witness tests should they so request. Obtain list of manufacturers of Owner furnished equipment from the Architect/Engineer.

1.8 INDEPENDENT TESTING FIRMS

A. Dymax Services, Inc.
23460 Industrial Park Drive
Farmington Hills, MI 48335
(248) 477-6066

B. Power Plus Engineering, Inc.
46545 Magellan Drive
Novi, MI 48377
(248) 344-0200

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

A. Perform preliminary inspections and tests immediately prior to performing acceptance tests. Fuses and fusing devices, such as cable limiters, shall be omitted from cable tests and tests involving cables.

3.2 MEGGER TESTS

A. Megger readings specified are the minimum readings desired at an ambient temperature of 60 degF (15.56 degC) and at a low relative humidity. When megger readings are taken at other than 60 degF, convert readings to equivalent values at 60 degF.

B. When megger readings fall below the specified minimum values at 60 degF, devise some means of applying heat for the purpose of drying out the equipment subject to the approval of the Architect/Engineer. If drying is to be done by applying an electric potential to a piece of equipment, do not exceed the continuous voltage or current ratings of the equipment being dried, either directly or by induction.

3.3 CONTINUITY TESTS

A. Perform continuity tests with a DC type device using a bell or buzzer. Do not use phones for continuity test; use phones only for communication.

3.4 CABLES, LOW-VOLTAGE (600V MAXIMUM)

A. General:

1. Provide visual and mechanical inspection of all cables.
2. Provide a continuity test for all feeders and subfeeders.
3. Provide a megger test for all cables serving loads 200 amperes and above.
4. Provide uniform resistance testing of all parallel conductors.
5. Verify that phase identification was provided and its accuracy for each power feeder and subfeeder cable.
6. Verify identification of all lighting circuits and 120 volt circuits on the panel directories.
7. Test and verify thorough operational tests that all lighting and 120 volt circuits perform all the functions for which they were designed.

B. Visual and Mechanical Inspection:

1. Inspect and compare cable data including size and quantity of cables with drawings and specifications. Report differences in test report and include on contractor's "as-built" drawings.
2. Inspect exposed sections of cables for physical damage.
3. Inspect bolted electrical connections for high resistance using one of the following methods:

    a. Use of low-resistance ohmmeter.
    b. Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data.
    c. Perform thermographic survey.

4. Inspect compression-applied connectors for correct cable match and indentation.
5. Inspect for correct phase identification and phase arrangements.
6. Inspect jacket and insulation condition.

C. Electrical Tests:

1. Perform resistance measurements through bolted connections with low-resistance ohmmeter.
2. Megger Test: Perform insulation-resistance test for each conductor with respect to ground conductors. Test duration shall be one minute. Applied potential shall be as follows:

    a. 500 volts DC for 300 volt rated cable.
    b. 1000 volts DC for 600 volt rated cable. Minimum permissible insulation-resistance.
    c. Tested value shall be 50 megohm for isolated cables and 5 megohms for non-isolated cables.

3. Perform continuity tests to insure correct cable connection.
4. Verify uniform resistance of parallel conductors.

D. Connections: Isolate power cables to be megger tested by opening switches or breakers at each end of cable prior to testing where such disconnecting means exists. Where cables are direct connected without a disconnecting means, do not disconnect cables; test as connected.

E. Acceptance: Cable must pass all inspections and tests.

F. Records:

1. Include the following information in test report on each 480 volt power cable:

a. Complete cable identification and description of isolation means.
b. Megger readings, including converted values.
c. Approximate average cable temperature.

3.5 TESTS ON GROUNDING

A. General: Inspect ground conductors and connections for conformance with design specifications and for satisfactory workmanship. Test resistance to earth of each ground rod and each ground grid. Test ground paths for equipment and structural steel grounding.

B. Connections:

1. Maintain each ground rod isolated from the associated ground grid for tests on individual rods for resistance to earth.
2. Include associated ground rods and interconnecting wiring in tests on each grid system for resistance to earth.
3. Include ground bus on equipment, grid connection, and associated intermediate copper ground conductors in tests on ground paths for electrical equipment.
4. Include structural steel connection, grid connection and intermediate conductor in tests on ground paths for structural steel.

C. Tests On Ground Paths: Test ground paths for electrical equipment and structural steel for continuity by applying a low voltage DC source of current, capable of furnishing up to 100 amperes. The ground path for electrical equipment using structural steel must conduct 100 amperes. Resistance as calculated from the current and voltage must not exceed 0.010 ohms.

D. Acceptance: Grounding materials and connections must pass all inspections and must meet all specified maximum and minimum values.

E. Records: Make complete records of all tests. Include resistance values obtained, calculations of same, and methods of test and calculation.

3.6 TESTS ON SPECIAL SERVICE SYSTEMS

A. Perform operating tests on all special service systems to prove that all design functions are satisfactorily performed.

END OF SECTION 16080

SECTION 16120 - CONDUCTORS AND CABLES (0-600V)

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 work of this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Wire and cable systems as required, and all material and equipment, including wire cable, connectors and lugs, fittings, and wire and cable identification, as indicated or specified.

1.3 PERFORMANCE REQUIREMENTS

A. Furnish wire and cable on which standard factory tests established by ASTM, ANSI, IPCEA and NEMA have been performed.

1.4 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: Submit product data for each type and size of wire and cable. Identify material, construction data, insulation thickness, and jacket thickness. Submit color coding schemes for branch circuit wiring. Submit cable identifications.

C. Samples: Submit samples on request of the Architect-Engineer.

D. Submit test data for wire and cable upon request of the Architect-Engineer. Do not install wire and cable for which test data has been requested until test data is approved.

1.5 REGULATORY REQUIREMENTS

A. Wire and Cable: Listed by Underwriters' Laboratories as meeting National Electrical Code requirements and be so labeled.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver all wire and cable to the site on reels or in coils, plainly marked for complete identification, including the wire or cable size, the number of conductors, type of wire or cable, length, weight, thickness and character of the insulation and the name of the manufacturer. Furnish 600 volt wires and cables on coils and reels carrying original date perforated inspection labels of the Underwriters' Laboratories showing the number of feet and type of wire contained.

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

A. General Requirements: Furnish wire and cable per standard specifications established for such material and construction by ASTM, ANSI, IPCEA and NEMA, where applicable. Furnish copper conductors unless otherwise specified, not less than No. 12 AWG, except control conductors which may be No. 14 AWG. Furnish conductor sizes as indicated. Furnish solid or stranded conductors for sizes No. 10 AWG and smaller, and stranded conductors for sizes No. 8 AWG and larger.

1. Manufacturer: Provide products of one of the following:

a. American Insulated Wire Corp.
b. Cablec Corp.
c. Okonite
d. Pirelli Cable Corp.
e. Southwire.
f. Triangle.

B. Wire for Final Connection in Conduit to Incandescent Fixtures, HID Fixtures with Remote System and Remote Ballasts: Stranded copper, NEC Typ SF-2 rated 200 degC, 600 volts.

C. Wire for Use in Fluorescent Fixture Wiring Channels: Stranded copper, NEC Type THHN, or XHHW, rated 90 degC, 600 volts.

D. Wire for Exposed Cord Connection to Fluorescent Fixtures: Three conductor stranded copper, NEC Type SO rated 60 degC, 600 volts.

E. Wire for Exposed Cord Connection to integrally Ballasted HID Fixtures: Three conductor portable cord consisting of three stranded annealed copper conductors individually insulated with not less than 30 mils of heat and moisture resistant ethylene propylene rubber compound rated 90 degC, 600 volts, cabled round with fillers and binder tape covered with an overall neoprene jacket not less than 60 mils thick, UL Listed.

F. Wire for General Interior and Exterior Use: Single conductor, annealed copper, NEC Type XHHW or THHN/THWN rated 90 degC in dry locations and 75 degC in wet locations, 600 volts, or NEC Type RHW rated 75 degC, 600 volts, or Type THWN rated 75 degC, 600 volts.

G. Wire for General Interior and Exterior Use, Sizes No. 10 AWG and Smaller: Single conductor, annealed copper, NEC Type THW rated 75 degC, 600 volts.

H. Wire for General Interior and Exterior Use, Sizes No. 8 AWG Through No. 4/0 AWG: Single conductor, annealed copper, NEC Type RHW rated 75 degC, 600 volts; NEC Type THHN-THWN rated 90 degC in dry locations and 75 degC in wet locations, 600 volts.

2.2 CONNECTORS FOR SPLICING COPPER CONDUCTORS

A. Connectors for Straight Splicing Conductors Up To and Including No. 8 AWG: Solderless compression type.

1. Manufacturer: Provide one of the following:

a. Burndy "Hylink"
b. Panduit
c. Thomas & Betts "Sta-Kon"

B. Connectors for Pigtail Splicing Conductors Up To and Including No. 8 AWG: Solderless type; with a metallic insert connector within a plastic insulating cover having a temperature rating of 105 degC, 600 volts.

1. Manufacturer: Provide one of the following:

a. Buchanan
b. Ideal
c. Scotchlok

C. Connectors for Straight Splicing Conductors No. 6 AWG and Larger: Solderless compression 2-way type.

1. Manufacturer: Provide one of the following:

a. Burndy Type YS-L
b. Thomas & Betts 54500 Series

D. Connectors for 3-Way Splicing Conductors No. 6 AWG and Larger: Solderless compression type.

1. Manufacturer: Provide one of the following:

a. Burndy YS-T
b. Thomas & Betts 54700 Series

2.3 LUGS FOR TERMINATING COPPER CONDUCTORS

A. Lugs for Terminating Power Conductors Up To and Including No. 8 AWG: Solderless type, manufacturer's standard, unless otherwise specified.

B. Lugs for Terminating Power Conductors No. 6 AWG and Larger: Solderless compression type, one hole for No. 6 AWG through No. 4/0 AWG inclusive, and two hole for larger sizes.

1. Manufacturer: Provide one of the following:

a. Burndy Type YA-L
b. Thomas & Betts Series 54000

C. Lugs for Terminating Control and Switchboard Wiring: Solderless compression type with tinned ring tongue.

1. Manufacturer: Provide one of the following:

a. Burndy "Hylug"
b. Thomas & Betts "Sta-Kon"

2.4 WIRE LABELS

A. Wire Labels for Identification of Conductors.

1. Manufacturer: Provide products of one of the following:

a. Brady
b. Westline

2.5 INSULATING TAPE

A. General Use Tape:

1. Manufacturer: Provide one of the following:

a. Okonite Type CLF Catalog Series 602-20
b. Scotch 33 Plus

B. High Temperature Area Tape:

1. Manufacturer: Provide products of one of the following:

a. Plymouth/Bishop Insulating Products “77 Plyglas”
b. Scotch 27

2.6 MISCELLANEOUS

A. Lubricating Compound:

1. Manufacturer: Provide products of one of the following:

a. American Polywater Corp.
b. Ideal 77 Yellow or Wire Lube

B. Aluminum Joint Compound:

1. Manufacturer: Provide products of one of the following:

a. Burndy "Penetrox A"
b. Ilsco “DE-OX”
c. Thomas & Betts No. 21059

PART 3 - EXECUTION

3.1 GENERAL

A. Install wiring in raceway systems, as indicated and as specified. Install wiring only in completed raceway systems and when systems are protected from the weather. Install conductors continuous, without splices, between equipments, where possible. Where splices are required, make up splices in boxes; do not use fittings for same.

B. Install phase and neutral conductors of each branch or feeder circuit in a single conduit except where paralleling circuits are indicated. Install paralleling circuits of identical makeup and length as the paralleled circuit, and terminate conductors at the same location, mechanically and electrically, at both ends, to ensure equal division of the total current between conductors.

C. Continuously lubricate all non-armored cables of the larger sizes at the pull-in point of conduit systems with an approved compound compatible with conductor insulation or jacket.

D. Install conductors in such a manner that the bending radius of any wire or cable is not less than the minimum recommended by IPCEA and/or the manufacturer. Do not exceed manufacturer's recommended values for maximum pulling tension applied to any wire or cable.

E. Connect all power wiring to equipment such that phasing shall be A-B-C-N left to right, top to bottom and front to back, where possible, and permanently identify phasing on the structure or housing adjacent to bus. Phase identification A-B-C is equivalent to transformer phase identification X1-X2-X3 and H1-H2-H3.

3.2 COLOR CODING AND CONDUCTOR IDENTIFICATION

A. Provide single conductor cables having black insulation for power feeders and subfeeders. Do not color-code these circuits. Identify individual feeder and subfeeder conductors as to phase connection A, B, C by means of wire labels at each splice and termination.

B. Identify individual phase conductors of branch power and lighting circuits as to phase and system voltage by means of color coding in conformance with Section 210-5 of the NEC. Develop a unique color scheme for each different voltage system. Match existing schemes where such exist. Submit color schemes for approval of the Architect-Engineer prior to implementation. Provide conductor color coding by means of colored insulating materials or by means of colored wire labels attached to individual conductors in all outlet, pull or junction boxes and at all terminations.

C. Identify each control circuit wire at each termination by means of wire labels. Provide identification as indicated. Mark the white marking strip of all control terminal blocks with the same identification as the connecting wire in permanent black ink.

3.3 SPLICES AND TERMINATIONS

A. Splice and terminate conductors with connectors and lugs as specified for the specific size and type of conductor. Do not splice armored cable except where cable lengths are limited by reel capacity. Do not splice direct burial cable underground. Indent all compression type connectors and lugs with tools as recommended by the connector or lug manufacturer.

B. Thoroughly clean wire ends before connectors or lugs are applied. Before installing a compression connector or lug on an aluminum conductor, apply an aluminum joint compound to the exposed conductor and wire brush through the compound to remove the aluminum oxide film. Install the connector or lug immediately after wire brushing the conductor.

C. Whenever aluminum or copper lugs are terminated on aluminum bus, use a Belleville washer and two tin or cadmium plated washers, one on each side in combination with aluminum joint compound on all contacting surfaces. Tighten bolts until Belleville washer is flat.

D. Insulate all bare surfaces of conductors with a minimum of four layers (half lap in two directions) of electrical insulating tape. On larger splices and terminals, build up connection with electrical insulating putty before applying tape, to eliminate both sharp edges and voids.

END OF SECTION 16120

SECTION 16130 - RACEWAYS AND BOXES

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 work of this Section.

1.2 SUMMARY

A. Raceway systems as required, and all equipment and material, including conduit, fittings, boxes, wireways, and cable trays, as indicated or specified.

1.3 SUBMITTALS

A. Letter of Intent: Submit letter of intent for each item. Coordinate the items, as they relate to the work, prior to submittal. Items shall include:

1. Conduit and fittings
2. Boxes

B. Product Data: Submit complete data on each item. Coordinate the items, as they relate to the work, prior to submittal. Shop drawings shall include:

1. Wireways

PART 2 - PRODUCTS

2.1 CONDUIT

A. Rigid Steel Conduit, Elbows, and Couplings: Zinc-coated hot dip galvanized threaded steel per ANSI C80.1 "Specification for Rigid Steel Conduit, Zinc-Coated" and UL6. Each length of conduit shall be threaded on both ends.

1. Manufacturer: Provide products of one of the following:

a. Allied
b. ETP
c. Pittsburgh
d. Republic
e. Triangle

B. Electrical Metallic Tubing: Zinc-coated steel per ANSI C80.3-1977 "Specification for Electrical Metallic Tubing, Zinc-Coated".

1. Manufacturer: Provide products of one of the following:

a. Allied
b. ETP
c. Republic
d. Triangle

C. Flexible Steel Conduit: Per UL-1, "Flexible Steel Conduit".

1. Manufacturer: Provide products of one of the following:

a. Allied
b. ETP
c. Triangle

D. Liquid-Tight Flexible Steel Conduit: Per UL-1, "Flexible Steel Conduit", with a PVC jacket.

1. Manufacturer: Provide products of one of the following:

a. "Sealtite"
b. Electriflex

2.2 CONDUIT FITTINGS

A. Fittings for Rigid Steel Conduit: Cast or malleable iron bodies, cadmium or zinc-plated, with taper threads, screw attached cover plates, and gaskets when located in areas requiring gaskets as specified in Part 3.

1. Manufacturer: Provide products of one of the following:

a. Appleton Form 35
b. Crouse-Hinds Form 8
c. ETP
d. Pyle-National Form R

B. Expansion Fittings for Rigid Steel Conduit: Cast or malleable iron bodies, with threaded end caps for receiving fixed and movable conduits, metallic pressure packing and copper bonding jumper assembly, and providing for a minimum of 2 inches movement of the conduit in either direction.

1. Manufacturer: Provide products of one of the following:

a. Appleton Type XJ
b. Crouse-Hinds Type XJ
c. O-Z Type AX

C. Couplings and Connectors for EMT: Zinc-plated steel, set screw type.

1. Manufacturer: Provide products of one of the following:

a. Appleton
b. ETP
c. Midwest
d. Steel City
e. Thomas & Betts

D. Conduit Unions, On Continuous Run:

1. Manufacturer: Provide products of one of the following:

a. Erickson

E. Fittings for Flexible Steel Conduit: Malleable iron or steel, zinc or cadmium plated, securing the conduit by clamping action around the periphery of the conduit. Do not furnish fittings that anchor the conduit by means of set screws.

1. Manufacturer: Provide products of one of the following:

a. Appleton
b. ETP
c. Steel City

F. Fittings for Liquid-Tight Flexible Steel Conduit: Designed to maintain the liquid-tight feature of the installation.

1. Manufacturer: Provide products of one of the following:

a. Appleton ST Series
b. ETP
c. Thomas & Betts 5331 to 5360

G. Locknuts for Rigid Steel Conduit: Malleable iron or steel, zinc or cadmium plated.

H. Bushings for 1 Inch and Smaller Rigid Steel Conduits: Insulating plastic type of non-burnable thermosetting phenolic, conforming to Underwriters' Laboratories requirements. Do not furnish non-rigid plastic bushings.

I. Bushings for 1-1/4 Inch and Larger Rigid Steel Conduits: Malleable iron or steel, zinc or cadmium plated, with insulating insert of thermosetting plastic as specified for smaller conduit bushings, molded and locked into the bushing ring.

2.3 OUTLET BOXES

A. Sheet Steel Boxes: Galvanized or sherardized stock not less than No. 14 gage, with knockout openings, single or multiple gang, with extensions, adapters, plaster rings, tile covers, fixture studs and cover plates. Furnish accessories with same gage and finish as specified for boxes, except where special finishes are specified for covers and device plates in Section 16121. Provide sizes per NEC requirements for wiring space, except where minimum sizes are specified under Part 3.

1. Manufacturer: Provide products of one of the following:

a. Appleton
b. RACO
c. Steel City

B. Cast or Malleable Iron Boxes: Galvanized or cadmium plated, single or multiple gang, with taper threaded hubs, adapters and cover plates. Furnish cast metal, galvanized or cadmium plated accessories, except where special device plates are specified in Section 16121. Furnish gaskets when located in areas requiring gaskets as specified in Part 3. Provide sizes per NEC requirements for wiring space, except where minimum sizes are specified under Part 3.

1. Manufacturer: Provide products of one of the following:

a. Appleton
b. Crouse-Hinds
c. Pyle-National
d. Russelstoll

2.4 PULL AND JUNCTION BOXES

A. Boxes Less than 5 Inches by 5 Inches: Conform to requirements specified for Outlet Boxes.

B. Sheet Metal Boxes: Code gage, full seam welded with bent-in flanges seam welded at corner joints, screw fastened cover of same gage as box. Fasten cover with brass machine screws. Galvanize box and cover after fabrication. Provide sizes conforming to NEC requirements for wiring space, except where boxes of larger size are indicated. Furnish gaskets when located in areas requiring gaskets as specified in Part 3.

C. Cast or Malleable Iron Boxes: Code gage, with threaded hubs or conduit bosses for field drilling and tapping, screw fastened cover of same gage as box. Fasten cover with brass machine screws. Galvanize box and cover after fabrication. Provide sizes conforming to NEC requirements for wiring space, except where boxes of larger size are indicated. Furnish gaskets when located in areas requiring gaskets as specified in Part 3.

1. Manufacturer: Provide products of one of the following:

a. Hoffman
b. O-Z

2.5 WIREWAYS

A. Painted steel enclosure with hinged or screw fastened cover, bends, elbows, tees, crosses, adapters and accessories as required, easily assembled into a complete system. Provide sizes per NEC requirements for wiring space, except where larger sizes are indicated. Furnish gaskets when located in areas requiring gaskets as specified in Part 3 for outlet boxes.

1. Manufacturer: Provide products of one of the following:

a. General Electric
b. Hoffman
c. Square D

2.6 MISCELLANEOUS

A. Trapeze Hangers

1. Manufacturer: Provide products of one of the following:

a. Kindorf
b. Powerstrut
c. Unistrut

B. Shielding Paint

1. Manufacturer: Provide products of one of the following:

a. Thomas & Betts "KopR-Shield"

C. Sealant: Single component, non-sage urethane:

1. Manufacturer: Provide products of one of the following:

a. Sika Corp. “Sikaflex 1a”
b. Pecora Corp. "Dynatrol 1"
c. Sonneborn "Sonolastic NP-1"
d. Tremco “Dymonic”

PART 3 - EXECUTION

3.1 CONDUIT SYSTEMS

A. Install rigid steel conduit for all main feeders which include feeders to switchboards, panelboards, distribution panels, transformers, and motor control centers. Install rigid steel conduit for all conduits 2" in diameter or larger. Where conduits are routed exposed in "unfinished" or "open" areas, rigid steel conduits shall be installed up to 10'-0" above finished floor. Install rigid steel conduits for conduits which are embedded in the building floor slab. Unless otherwise specified or indicated, the use of electric metallic tubing is permitted for branch circuits above suspended ceilings, in concealed wall cavities in offices or similarly "finished areas", or in unfinished areas 10'-0" above finished floor.

B. Install flexible conduit in lieu of rigid conduit or EMT for service to individual recessed fixtures, 1/2 inch minimum size, and for final connection to equipment subject to vibration or movement. Use liquidtight type of flexible conduit in lieu of non-jacketed flexible conduit in damp or wet locations and for final connections to all motors and transformers.

C. Install conduit systems as indicated, as required by the NEC, and as specified. Install conduit sizes as indicated. Where conduit sizes are not indicated, install sizes per NEC requirements, except do not use conduit sizes smaller than 3/4 inch unless otherwise specified. Use 1/2 inch fixture stems optionally, unless otherwise indicated.

D. Install conduit concealed in office and similar finished areas, and exposed in all other areas unless otherwise indicated or specified. Do not run conduit in or under concrete floors in contact with earth in utility areas unless specifically indicated.

E. Install exposed conduit runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings. Keep conduit at least six inches away from parallel runs of high temperature surfaces, such as steam or hot water pipes and do not run conduit directly under cold water lines.

F. Group conduit for common support, where indicated and elsewhere as directed by the Architect-Engineer.

G. Do not install crushed or deformed conduits and avoid trapped runs in damp or wet locations. Take care to prevent the entrance of water and the lodging of concrete, plaster, dirt or trash in conduit, boxes, fittings and equipment during the course of construction. Free conduit of obstructions or replace the conduits. Where conduit joints occur in concrete slabs, or in damp or wet locations, make joints watertight by applying an approved compound on the entire thread area before assembling. Draw up all conduit joints as tightly as possible. Cap exposed empty conduits which do not terminate in outlets, panels, cabinets, etc. with standard galvanized plumbers pipe caps. Plug empty conduits which terminate flush with floors or walls with flush coupling and brass plug.

H. Install conduit sleeves for all exposed conduits and cables passing through walls, ceilings or floors, and fill the void between sleeve and conduit with sealant flush with the end of the sleeve to seal the opening.

1. For conduit sleeves passing through fire rated walls, floors or ceilings, comply with requirements of Section 07841 "Through-Penetration Firestop Systems".

I. Make changes in direction of runs with symmetrical bends, fittings or pull boxes. Do not use bends around outside corners; use fittings for same. Install elbows, bends and offsets having a minimum radius of curvature of 24 inches for 2 inch and 2-1/2 inch conduit, and 36 inches for 3 inch and larger conduit. Except where conduit runs are shown in exact detail, install pull points at not greater than 200 foot intervals in straight runs. Where bends are included between pull points, reduce this maximum permissible 200 foot separation between pull points by 50 feet for each 90 degree bend and 25 feet for each 45 degree bend. Figure deductions for all other angle bends on a similar basis. When bends are made in the field, make bends with an approved hickey or conduit bending machine. Make bends in 1-1/4 inch and larger conduits with standard conduit ells where possible.

J. Provide conduit nipples with two independent sets of threads. Do not use running threads on any part of the conduit system. Where conditions require joining two fixed conduits into a continuous run, use a conduit union, in place of running threads and coupling.

K. Install expansion fittings in exposed conduit runs of greater than 100 feet in length, crossing building expansion joints, and elsewhere as indicated.

L. Install double locknuts and bushings on all rigid conduit terminations into threadless openings. Increase length of conduit threads at terminations sufficiently to permit the bushing to be fully seated against the end of the conduit.

M. Use one hole malleable iron galvanized pipe straps for support of single conduits, or clevis type hangers. Support groups of conduit on trapeze hangers. Use threaded rod or pipe for hanger support. Do not use perforated strap or wire for conduit or hanger support. Use beam clamps or malleable iron or wrought steel with hook rods to grip the beam flange for conduit or hanger support; do not use C-clamp type fittings. Support exposed conduit at least every 8 feet if smaller than 2 inch, and every 10 feet if 2 inch and larger unless otherwise noted.

N. All wiring shall be installed in raceways. The use of MC cable, AC cable, or BX cable shall not be permitted.

O. All emergency and exit lighting wiring shall be installed in dedicated conduits. Conduits and outlet boxes shall be marked and labeled.

P. All conduit systems and circuits shall be provided with an equipment grounding conductor.

3.2 OUTLET, SWITCH, JUNCTION AND PULL BOXES

A. Outlet Boxes for Use with Rigid Steel Conduit in Non-Hazardous Areas: Sheet steel for flush or concealed work in dry locations; cast or malleable iron in exposed, damp or wet locations. Do not use sheet steel outlet boxes in utility areas.

B. Outlet Boxes for Use with Electrical Metallic Tubing: Sheet steel for flush or concealed work; cast or malleable iron for exposed locations.

C. Flush Mounted Boxes: For single outlets, use boxes not less than 4 inches square and 2-1/8 inches deep. For multiple outlets, use gang type boxes not less than 2-1/4 inches deep. Furnish plaster rings not less than 1-1/8 inches deep. For ceiling outlets in concrete slabs, use boxes not less than 3 inches deep.

D. Gaskets: Provide cover gaskets for boxes in damp or wet locations and in utility areas.

E. Pull and Junction Boxes for Use with Each Type of Conduit: As specified for outlet boxes for each conduit type under above paragraphs.

F. Install boxes in the wiring or raceway systems as required for pulling of wires, making connections, and mounting of devices and fixtures.

G. Install extension rings, adapters, raised covers and plaster rings on flush mounted boxes as required. Equip flush mounted boxes in masonry block or tile walls with tile covers.

H. Install separate concealed boxes for semi-flush or recessed fixtures when required by the fixture terminal operating temperature. Make boxes readily accessible on removal of the fixture or provide ceiling access panels as approved by the Architect-Engineer.

I. Locate outlets in offices and other finished areas with due regard for the finish and interior architectural treatment so that outlets are centered with respect to panels, joints or moldings, and so that plaster rings, frames and tile covers are properly located with respect to the finished surface.

J. Install outlets for wall switches controlling lighting on the latch side of door where possible.

K. Support boxes independent of conduit and secure rigidly in place. Install boxes used for fixture support such that they are capable of carrying 100 pounds.

L. In concrete, anchor boxes securely to reinforcing steel and to forms to prevent shifting when concrete is placed.

M. Above suspended ceilings, support boxes independent of the ceiling; fasten boxes to the ceiling support system by bar hanger or other approved support.

3.3 WIREWAYS

A. Install wireways at locations indicated. Where wireways are located on surfaces, do not install wireway in contact with such surfaces; support wireways with not less than 1/4 inch separation from the surface.

B. Provide supports at a maximum of 5 foot intervals.

C. Where pendant supports are indicated or required, provide 1/2 inch diameter threaded rods with beam clamps as specified for conduit supports. Provide lateral bracing at not greater than 10 foot intervals.

END OF SECTION 16130

SECTION 16190 - SUPPORTING DEVICES

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 work of this Section.

1.2 SUMMARY

A. This section includes straps, clamps, steel channel, and fastening hardware for supporting electrical work.

1.3 REFERENCES

A. NECA - National Electrical Contractors Association.

B. ANSI/NFPA 70 - National Electrical Code.

1.4 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Materials and Finishes: all material provided shall have a protective zinc coating either Electro-Plated (ASTM B633 SCI or SC3), Pre-Galvanized (ASTM A525 coating designation G90) or Hot-Dip Galvanized after fabrication (ASTM A123). The minimum thickness of zinc coating shall be 0.2 mil (5 micrometers).

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. All structural supports and channels shall be manufactured from ASTM A570 grade 33 steel. The minimum gauge of steel shall #16.

D. The contractor shall replace all supports and channels that sag, twist, and or show signs of not providing proper structural support, to the equipment, it is intended for, as determined by the Owner and Engineer. All costs associated with replacing supports and steel channels shall be incurred by the contractor.

E. Anchors and Fasteners:

1. Concrete Structural Elements: Use expansion anchors, powder actuated anchors and preset inserts.
2. Steel Structural Elements: Use beam clamps and steel ramset fasteners.
3. Concrete Surfaces: Use expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use hollow wall fasteners.

5. Solid Masonry Walls: Use expansion anchors.
6. Sheet Metal: Use sheet metal screws.
7. Wood Elements: Use wood screws.

PART 3 - EXECUTION

3.1 INSTALLATION

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

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation."

C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

D. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

E. Install surface-mounted cabinets and panelboards with minimum of four anchors.

F. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch (25 mm) off wall.

G. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION 16190

SECTION 16195 - ELECTRICAL IDENTIFICATION

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 work of this Section.

1.2 SUMMARY

A. Identification is required for the following principal items of equipment and systems (not an inclusive list):

1. Disconnecting means.
2. Ungrounded conductors.
3. Wiring device terminals.
4. Panelboard circuits.
5. Fire protective signal circuits.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Provide identification on all electrical equipment installed, including switches, etc.

B. Nameplates shall be laminated phenolic plastic, beveled edged white with engraved black letters. Except where impractical, letters and numerals shall be a minimum of 1/4 inch high. Nameplates shall be mechanically secured. Pressure sensitive nameplates are not acceptable. Panel directories shall be neatly typed, showing equipment served and location for each switch with a clear plastic protective cover. Update all panel directories in existing panelboards affected by the work of this project by providing new typed directories in these panels.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Marking: The manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified shall be placed on all electric equipment. Other markings shall be provided indicating voltage, current, wattage, or other ratings as applicable. The marking shall be sufficient durability to withstand the environment involved.

B. Identification of the following specific equipment and systems should be addressed:

1. Disconnecting means for motors, appliances and branch circuits.
2. Grounded conductors: identified by a continuous white or natural gray outer finish along its entire length.
3. Terminals.

a. Terminals to which the grounded conductor is to be connected shall be white in color.

C. Identify and/or color code:

1. Ungrounded conductors where more than one nominal voltage system exists in a building.
2. Grounded conductor of branch circuit wiring identified by a continuous white or gray color.
3. Equipment grounding conductor identified by a continuous green color or continuous green color with one or more yellow stripes.
4. Intrinsically safe circuits.
5. Fire protective circuits.

END OF SECTION 16195

SECTION 16570 - LIGHTING CONTROL SYSTEM

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 Work of this Section.

1.2 DESCRIPTION OF SYSTEM

A. These Specifications, together with the related Drawings and General Conditions of the Contract, comprise the requirements for the lighting control system.

B. The lighting control system shall include lighting control panels, control modules, control stations and other user interface devices, wiring, and ancillary programming equipment. Type of lighting control equipment and wiring specified in this section includes the following:

1. Programmable digital relay control panels.
2. Digital low voltage control stations.
3. Network routing and repeating devices.
4. Hardwired low voltage control.
5. Control modules for relay control.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated including, but not limited to:

1. Control panel cabinets include physical dimensions, sequence of operation, types and quantity of modules being provided, and spare capacity of modules.
2. Provide dimensions, features, characteristics, and ratings of each type of module being provided.
3. Control stations and plate color and material.
4. Ballasts and lamp combinations compatible with controls.
5. Sound data including results of operational tests of controls.
6. Operational documentation for software and firmware.

B. Shop Drawings: Detail assemblies of standard components, custom assembled for specific application on this Project.

1. Outline Drawings: Indicate dimensions, weights, arrangement of components, and clearance and access requirements.
2. Front elevations of all control panels and control stations including the customized legends on each device.
3. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.
4. Wiring Diagrams: Power, signal, and control wiring. Coordinate nomenclature and presentation with a block diagram.

C. Coordination Drawings: Submit evidence that lighting controls are compatible with connected monitoring and control devices and systems specified in other Sections.

1. Show interconnecting signal and control wiring and interfacing devices that prove compatibility of inputs and outputs.
2. For networked controls, list network protocols and provide statements from manufacturers that input and output devices meet interoperability requirements of the network protocol.

D. Samples: Provide a sample of a typical control station for review during the shop drawing review process. The sample shall be an actual factory mock-up of the proposed control station including all required faceplates, pushbuttons, dimmer controls and engraving per the project specifications.

E. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

F. Software Upgrade Kit: For Owner to use in modifying software to upgrade and to allow system expansion.

G. Field quality-control test reports.

H. Operation and Maintenance Data: For control modules, control stations, normal system operation, emergency system, operation, and maintenance manuals. In addition to items specified in Division 1 Sections include the following:

1. Software manuals.
2. Adjustments of scene preset controls, adjustable fade rates, and fade overrides.
3. Operation of adjustable zone controls.
4. Testing, operation and adjusting of panic and emergency power features.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain dimming controls from a single source with total responsibility for compatibility of lighting control system components specified in this Section.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.

D. Comply with NFPA 70.

1.5 COORDINATION

A. Coordinate lighting controls with that in Sections specifying distribution components that are monitored or controlled by power monitoring, power control equipment, and audio/video systems.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of lighting controls that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Software: Failure of input/output to execute switching commands.
b. Failure of modular relays to operate under manual or software commands.
c. Damage of electronic components due to transient voltage surges.
d. Failure to switch relays to "on" status and to switch dimmer modules to full light output in power failure mode.

2. Warranty Period: Cost to repair or replace any parts for two (2) years from date of Substantial Completion.

1.7 SPARE PARTS

A. Furnish spare parts described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Relay Control Modules: Provide full-size units equal to ten (10) percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Andover Lighting Controls System

2.2 SYSTEM DESCRIPTION

A. The lighting control system shall provide seamless control and monitoring of all lighting included in the scope of work. All lighting control panels, unless otherwise noted, shall be interconnected by a communication buss making possible the sharing of control functions and status system wide. The system shall have astronomic clock, scheduling software, diagnostic software, programmable inputs and programmable outputs.

B. There is one (1) type of lighting control panel, a) feed through design.

C. Feed-through panels shall house control modules with pilot duty controls or load duty relays. The load duty relays shall have overcurrent protection located in remote lighting panelboards.

D. Control inputs shall be transferable over the network to affect lighting control patterns and zones regardless of to which relay panel the loads are connected. Overrides for after hour use or cleaning shall be accomplished via pushbutton switch.

E. A single PC software application shall provide the means to configure, set-up, and monitor the operation of all lighting control panels

2.3 FUNCTIONAL SYSTEM DESCRIPTION

A. Low voltage switch manual operation sends a signal to programmable-system control module that processes the signal according to its programming and routes an open or close command to one or more relays in the power-supply circuits to groups of lighting fixtures or other loads.

B. Remote contact closure switch, an internal timing and control unit, or an external sensor or other control signal source sends a signal to programmable-system control module that processes the signal according to its programming and routes an open or close command to one or more relays in the power-supply circuits for groups of lighting fixtures or other loads.

2.4 HARDWARE

A. Enclosures:

1. Shall be NEMA 1 rated, code gage steel cabinet. Enclosure and contents shall be designed to operate in interior spaces with temperatures of 32° - 104° F (0° - 40° C) and 0-90% non-condensing humidity.
2. Enclosures for relay control components that have only pilot duty or load duty relays and no circuit breakers contained within the enclosure shall be of feed through design.
3. Enclosures shall be provided with barriers to separate the line voltage wiring from the low voltage wiring.
4. Panels shall be provided with hinged covers with lockable latch. All latches shall be keyed alike.
5. Enclosure Dimensions: Enclosures shall be sized with space and provisions for a minimum of 16, 24 or 48 relays, control power transformer, controller and control components. The actual quantity of relays shall be as indicated on the schedule.
6. Multi-tapped Transformer: The enclosure shall be supplied with multi-tapped transformer and shall not require specification of voltage for each control location.
7. Modular Design: The power modules and system controller shall be modular and designed for ease of field service or upgrade.

2.5 CONTROL MODULES

A. Control Module Description (Pilot Duty Relay Used for Controlling Contactors or Remote Control Devices): Complying with UL 916; microprocessor-based control unit receives programming from the TSD central programming station. Control units shall include a solid-state, programmable, 365-day timing unit and can receive inputs from indicated sensors and other sources. Output circuits shall be pilot-duty relay type capable of operating latching-type, single-pole lighting circuit relays; multi-pole lighting contactors; and other devices. Output circuits shall include digital circuits arranged to transmit control commands to remote preset dimmers. Modules and their associated control panels shall include the following features:

1. Multiple inputs and multichannel output arranged for 8 channels.

B. Control Module Description (Load Duty Relay Used for Lighting Control When Branch Circuit Overcurrent Protection is Located in Lighting Panelboards): Programmable; complying with UL 508; microprocessor-based control unit mounted in preassembled modular relay panel. Low-voltage-controlled, latching-type, single-pole 20 ampere lighting circuit relays shall be prime output circuit devices. Where indicated, a limited number of digital or analog, low-voltage control-circuit outputs shall be supported by control unit and circuit boards associated with relays. Control units can receive inputs from indicated sensors and other sources. Each relay shall be provided with an override switch and LED status indicator. Line-voltage components and wiring shall be separated from low-voltage components and wiring by barriers. Control module shall be locally programmable.

C. Load Duty Relay Control Module Additional Requirements (For Relays With and Without Integral Circuit Breakers):

1. Mechanical: All control module components shall be mounted to heavy steel back plane. Module shall install into enclosure with keyed tab and slot hardware, secured in place with heavy duty screws.
2. Input/Output Features: Control module shall provide low voltage switch input, pilot light output, analog input, and line voltage output control of lighting loads. Control modules shall be operable without the system controller installed for direct operation of lighting loads or with the system controller for programmable input to output mapping. Each module shall provide the following input and output connections:

    a. 20 amp output relays
    b. Override switch inputs
    c. Pilot light output per relay
    d. Analog input for 0-10VDC operation
    e. 24VDC accessory power terminals

3. Relay Status Indicators: The system shall provide LED status indicators for all relay outputs.
4. Relay Ratings: Relays shall be SPST, last state with enclosed silver cadmium-oxide isolated contacts. Relays shall be rated to at least 16 amps at 277 VAC electronic or HID ballast, 15 amps, 120VAC tungsten.
5. Relay Response: Relays shall respond as momentary latch on/latch off.
6. Zero-Cross Load Switching: The system shall limit the effect of inrush current on relay contacts by restricting the change-state timing of the output relays to occur within ± 10% of the zero cross point of the output wave form.

7. Switch Inputs: Each relay control module shall have terminals for programmable dry contact closure inputs. Momentary or maintained contacts shall be supported as latching 3-wire momentary 2-wire, momentary alternate action or 2-wire maintained contact. Inputs shall be dry contact with 12 VDC, 12 mA internally sourced. Inputs shall be linkable to any number of relays for override control.
8. Analog Inputs: Inputs shall be capable of monitoring external analog sensing devices such as a photocell. It shall be possible to control the output relays in response to analog input values with 100 steps of analog control resolution.
9. Service Override Switch: Each control module shall have an On/Auto/Off service override switch that shall control all relay outputs on the module. Whenever active, the On or Off override condition shall be visually and audibly annunciated via the user interface panel on the system controller.

D. Multi-Pole Contactor Modules:

1. Mechanical: Contactors field mount to accessory mounting plate, four contactors maximum per plate. Field replaceable contacts and coils shall be available.
2. Operation: Provide integral control of multi-phase lighting loads. Contactors shall be suitable for 120/208V, 120/240V or 277/480V branch circuit control.
3. Electrical: Multi-pole contactors shall be provided as indicated on the drawings. Up to 16 poles shall be configured per module. Contactor ratings shall be as follows:

   a. 2 pole: 600 VAC maximum, 25 amps per pole, 50/60 hz.
   b. 3 pole: 600 VAC maximum, 60 amps per pole, 50/60 hz.
   c. 4 pole: 600 VAC maximum, 30 amps per pole, 50/60 hz.

E. System Controller:

1. Mechanical: The system controller shall be supplied as a modular chassis consisting of the user interface panel, system control electronics, and provision for installation of up to four industry standard half length ISA accessory boards. The system controller shall plug into the enclosure as an assembly for ease of installation, service, or upgrade. All system controllers shall be installed into the enclosures only after the rough-in phase of installation is complete.
2. Capacity: The system controller shall have the capacity to operate up to 12 power modules in two enclosures, permitting up to 96 points of control from each system controller.
3. RS232 Port: Provide a front mounted DB9 serial connector for connection of a personal computer or other external serial device. Provide a second DB9 serial connector within the enclosure for permanent connection of serial devices.

F. Network:

1. Communication: System controllers shall be capable of panel-to-panel communications over a high speed 156Kbps, hard-wired data network.
2. Wire: Network wire shall be twisted and shielded pair, installed in a daisy chain configuration, and rated for EIA-485 data communication. Network wire type and installation shall be per the lighting control system manufacturer's requirements without exception.

2.6 FIRMWARE FEATURES

A. Groups: It shall be possible to associate output relays into logical control zone groups. Groups shall be assignable to schedule events, switch inputs, analog inputs, control station channel or presets. It shall not be necessary to program functions or schedules individually for each output. Groups shall be network visible to other building systems as standard BACnet objects.

B. Astronomic Clock: The system clock shall of the astronomical type and be capable of calculating the correct time for sunrise and sunset at the installed local. It shall be possible to set control functions to occur at or up to 99 minutes before or after sunrise or sunset.

C. Daylight Savings Time: The system shall automatically adjust for daylight savings time. It shall be possible to disable this function.

D. Schedules: The system shall support up to 99 unique lighting control schedules. The quantity of time schedule events contained in the schedules shall be limited only by the available system memory and shall be dynamically allocated to the schedules such as to not limit the capacity of any single schedule.

E. Schedule Assignment: Unique schedules may be assigned to each day of the week facilitating a rotating Monday through Sunday weekly operating scenario. A unique holiday schedule shall automatically supercede assigned weekday schedules based on a list of holiday dates. Additionally, schedules may be assigned to specific calendar dates. A schedule assigned to a calendar date shall have priority over a schedule assigned to a Monday through Sunday upon which the calendar date occurs such that only one schedule runs on any given day.

F. Overrides: It shall be possible to override schedule operation and force outputs to an ON or OFF state. Overrides shall be initiated from a variety of system sources including switch inputs, analog inputs, telephone interface, modem, or network. Four types of override shall be available:

1. Priority Normal: Under normal conditions, a group can be overridden ON or OFF by any available input source programmed to control the group. The group will remain in the overridden condition until changed by a schedule event or by another override source.
2. Priority ON: The priority ON override shall force the group ON and not allow further control until the priority ON override is released by the source. In the event of overlap, priority ON shall take precedence over priority OFF.
3. Priority OFF: The priority OFF override shall force the group OFF and not allow further control until the priority OFF override is released by the source.
4. Priority Low: The priority low condition shall allow layering of control strategies to optimize operation. Switches or other inputs set to low priority shall be subservient to normal priority overrides or schedules.

G. Inter-Panel Control: Each system controller input and output shall include provision to annunciate actuation over the network making events available for use by all controllers connected to the network. This function shall be settable via the user interface panel on the system controller and not require the use of a personal computer for inter-panel operation over the network.

H. Flash to Find: It shall be possible to set any output to continuously flash on and off to facilitate easy location of undocumented loads. The flash to find function shall automatically cancel after two minutes.

I. Status: Each system controller shall be capable of displaying the current real time status of all inputs and outputs associated with the controller.

1. Input Status: The current state of each input shall be displayed as ON or OFF for switch inputs or as a value for analog inputs.
2. Output Status: The current state of each output shall be displayed as ON or OFF for relay outputs.
3. Network Status: The network status display shall indicate that the system controller is actively communicating on the local input/output buss and the network by displaying network message traffic expressed as a percentage of capacity. This display shall also indicate the currently available system RAM and flash disk memory.

J. Logging: The system controller shall automatically retain a record of system control events and run times and shall make this information available to the user via the user interface panel on the system controller.

1. Event Log: The system shall automatically log in memory key actions performed by the system controller. Each log entry shall be time and date stamped. It shall be possible to view or print the event log via the user interface panel or PC software. A minimum of 2000 system events shall be saved before the system begins to overwrite the oldest data. Logged actions shall include, but not be limited to:

a. Power up
b. Power down
c. Input change of state
d. Output change of state
e. Manual override
f. Network event
g. New script
h. Alarms

2. Relay Run Time: A cumulative "ON" time record shall be accumulated for each output. It shall be possible to view and reset the run time for each output via the UIP or PC software.
3. Relay Starts: A counter shall track the quantity of starts for each output. It shall be possible to view or reset the number of starts for each output from the UIP or PC software.

K. Script File: All system parameters and user programming shall be stored within the system controller in the form of an editable text file. It shall be possible to upload and download the file between the system controller and a personal computer.

L. Script Logic: The system controller logic shall support the creation of customized logical control scenarios. Scenarios shall be created off line using the optional Widows based configuration software package. As a minimum, the system shall understand and process "basic" IF, AND, OR, THEN, ELSE, = (equal), < (less than), and > (greater than) logical statements. Commands and operations to be tested and/or acted upon shall include as a minimum: DAY, DATE, TIME< INPUT, OUTPUT, TIMER, INC COUNTER # (increment counter #), DEC COUNTER (decrement counter #), and RESET COUNTER.

2.7 CONFIGURATION SOFTWARE

A. Provide PC software for off-line programming and editing of lighting control panel script files. The application shall run on any personal computer using the Windows 95/98/NT operating system and shall support the BACnet file transfer services allowing co-installation and network operation with other BACnet building automation workstations.

B. It shall be possible to upload, edit and download user program and log data through a direct connection to the lighting control system network or remotely through the use of a telephone modem.

C. The configuration software shall have the ability to "learn" the hardware components that are present in the system and automatically configure a script file using default values which may then be edited by the user.

D. The system shall support the simultaneous use of multiple personal computers.

E. The application shall be BACnet compliant and designed to co-reside on a PC workstation running other BACnet building control applications.

2.8 CONTROL STATIONS

A. Control stations shall provide individual on/off pushbutton control for relay switch inputs as indicated on the drawings.

B. Control stations shall be provided with backboxes appropriately sized to accommodate the associated control station. Backboxes shall be available to the installing contractor for rough-in prior to control station installation.

C. Control stations shall have stainless steel faceplates. Pushbuttons shall be white. Refer to drawings for button details.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all equipment at locations indicated, and secure to ceilings, walls, floors or structural members as required.

B. Provide special cable as indicated or specified by manufacturer.

C. Install all wiring in conduit systems as indicated and as specified in Section 16130.

D. Provide final wiring and connections per the manufacturer's wiring diagrams.

E. Provide a dedicated power feed to each panel for the panel transformer supplying power for the control circuits.

3.2 QUALITY CONTROL

A. Independent Testing Laboratory: The control panels shall be tested and listed under the UL 916 Energy Management Equipment standards.

B. System Checkout: A factory authorized technician shall functionally test the system and verify performance after contractor installation.

C. System Programming: The system shall be turned over to the Owner programmed and ready for immediate operation. It shall be the responsibility of the contractor to coordinate with the Owner and supply the necessary "as-installed" information and schedule requirements for system programming in a timely manner.

D. Adjusting: After completion of system wiring, connect, test, adjust, and readjust as necessary, all equipment in terms of design function and performance.

E. Demonstration: After checking has been completed and system is operational, demonstrate to the Owner the complete and correct functioning of all system components and equipment. These demonstrations shall consist of operating the controls through their normal full ranges and sequences. Simulate abnormal conditions to demonstrate proper functioning of the devices. Readjust settings to their correct design values and, after sufficient time, observe ability of controls to establish the desired conditions, noting abnormal deviations. Make necessary repairs, replacements or adjustments on items which fail to perform satisfactorily and repeat tests to demonstrate compliance with the design intend.

1. When system is in specified operational condition, and when pertinent operational functions have been demonstrated, system will be accepted.

3.3 CODES AND STANDARDS

A. IEEE Standard 2000.1-1998

B. UL 916 Energy Management Equipment

C. California Energy Commission

3.4 PRODUCT SUPPORT AND SERVICE

A. Provide a factory authorized technician to verify the installation, test the system, and train the Owner on proper operation and maintenance of the system. Before requesting start-up services, the installing contractor shall verify that:

1. The control system has been fully installed in accordance with manufacturer's installation instructions.
2. Low voltage wiring for overrides and sensors is completed.
3. Accurate "as-built" load schedules have been prepared for each lighting control panel.
4. Proper notification of the impending start-up has been provided to the Owner's representative.

B. Factory telephone support shall be available at no cost to the Owner during the warranty period. Factory assistance shall consist of assistance in solving programming or other application issues pertaining to the control equipment. The factory shall provide a toll-free number for technical support.

END OF SECTION 16570

Troy School District
Lighting Replacement
Bid 9670

	J.B. Electrical	Techborne	Allied Building Service	Great Lakes Power & Lighting
BASE BID				
Athens High School	$ 104,082.00	$ 116,800.00	$ 145,283.00	$ 157,000.00
Boulan Park Middle School	42,631.00	47,300.00	48,101.00	55,000.00
Larson Middle School	38,882.00	47,300.00	47,205.00	55,000.00
Mandatory Alternate 1	Add 3,313.00	Add/Deduct not specified 8,800.00	Deduct (8,400.00)	Add 3,200.00
Voluntary Alternate 1	n/a	If all 3 schools awarded (5,300.00)	n/a	n/a
TOTAL	**$ 188,908.00**	**$ 214,900.00**	**$ 232,189.00**	**$ 270,200.00**