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Project Title:

Onna Moniz-John Park and Central Avenue Playground

Lighting Improvements Project

City of East Providence, RI

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LIST OF DRAWINGS

Project Title:

Onna Moniz-John Park and Central Avenue Playground
Lighting Improvements Project

City of East Providence, RI

Contract Drawings:

Contract Drawings shall be those plans entitled, '*Onna Moniz-John Park/Central Avenue Playground Lighting Improvements Project*', sheets 1-2 of 2, dated September 2015, with revisions through 12/23/15, as prepared by Kevin M. Alverson Landscape Architecture

List of Drawings:

<i>Drawing Number</i>	<i>Drawing Title</i>
Sheet 1 of 2	Lighting Plan
Sheet 2 of 2	Lighting Details

SUMMARY OF WORK

Section 01010

Part 1 - General:

1.01 – Work Covered by Contract Documents:

- A. Base Bid: The work to be done under this Contract, 'Onna Moniz-John Park and Central Avenue Playground Lighting Improvements Project,' consists of furnishing and installation of new electric service and lighting improvements, as specified, and as shown on the Contract Drawings.
- B. Contract Adjustments: Contract Adjustments and procedures for said adjustments to Scope of Work during the Course of Construction are outlined in other sections of this Project Manual, including, but not necessarily limited to Section 01035 of these specifications.

1.02 – Schedule of Work:

- A. The Contractor is required to submit a detailed Schedule of Work outlining the anticipated tasks and specific project schedule for the successful completion of the project. This shall be submitted to the Owner's Representative after a Pre-construction conference to be scheduled between the Owner, the Owner's Representative, and the Contractor, and prior to the start of construction. The schedule shall be updated every two weeks during construction procedures.
- B. The Contractor is advised of the following when preparing the required Schedule of Work:
 - 1. The Contractor shall coordinate input from all Subcontractors and Suppliers in the preparation of this schedule.
 - 2. The Contractor's operations, scheduling, and site access shall be coordinated with the Owner.
 - 3. Work at night, on Sundays, or on major Holidays will be prohibited without explicit Owner's written permission except in the case of emergency. The Contractor shall provide, at his own expense, all lighting, traffic control, safety equipment, and other facilities necessary for the proper execution of the work.

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1.03 – Contract Drawings and Specifications:

- A. The Contract Drawings shall be those drawings entitled, 'Onna Moniz-John Park/Central Avenue Playground Lighting Improvements Project,' as prepared by Kevin M. Alverson Landscape Architecture, dated September 2015, as amended.
- B. The Contract Drawings and Specifications are included in the Contract Documents, and intended to complement each other. All work called for by either shall be as binding as if called for by both.
- C. The Contractor shall thoroughly acquaint himself with the Project Site, Contract Agreement, and all requirements of the Specifications and Contract Drawings. For reference, these Specifications are separated into sections. All sections are complimentary and as such shall not operate to make the Owner's Representative an arbiter to establish jurisdictional limits.
- D. Additional Drawings, Memoranda, Illustrations, etc., prepared during the course of construction to clarify or interpret the Project Specifications, or modify the contract during construction shall be incorporated into the Contract Documents, and will be considered part of the Project Record.
- E. All Drawings, Specifications and Memoranda relative to the work are the property of the Owner and shall be returned to the Owner's Representative at the completion or cessation of the work.

1.04 – Obligations of the Contractor:

- A. The contractor shall furnish all labor, materials, plant, supplies, equipment, tools and all other facilities necessary to the proper and complete construction of the project, as required by the Contract Drawings and as specified herein.
- B. Throughout the duration of the Contract, wherever it is specified that work is to be done, or labor, materials or equipment are to be furnished, it is understood to mean that the said work to be done or the labor, materials or equipment to be furnished is to be supplied or done by the Contractor at his own proper cost or expense.
- C. Errors and/or Discrepancies:
 - 1. The Contractor shall verify all quantities and measurements as may be shown on the Contract Drawings or called for in the Specifications and shall notify the Owner's Representative of all discrepancies, errors or omissions found therein.

SUMMARY OF WORK

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2. The Contractor shall notify the Owner's Representative immediately of any apparent ambiguity, error or omission in the Contract Drawings or Specifications. The failure to correctly or specifically mention or note any portion of the work, the proper performance of which is evidently necessary to fulfill the general intention of the Contract Drawings and Specifications, shall not act to release the Contractor from the proper performance of such work in the identical manner as if fully and correctly indicated and without expense to the Owner beyond the stipulated Contract price or prices. The forgoing shall not apply to additions, improvements or changes for which provisions have been otherwise made.

D. Mutual Responsibility:

1. If the Contractors or Subcontractors suffer loss or damage to their work through acts of neglect on part of General Contractor, then General Contractor agrees to satisfactorily arrange for settlement with other such Contractor or Subcontractor, if other such Contractor or Subcontractor will so settle.
2. If, however, such other Contractor or Subcontractor chooses to assert claim against Owner, on account of damage alleged to have been sustained, Owner shall notify Contractor, who shall defend, at his expense, any suit based on such claims, and, if judgment or claims against Owner shall be allowed, Contractor shall pay or satisfy such judgment or claims, and pay costs and expenses in connection with same.

E. Legal Address of the Contractor:

1. The address given in the Proposal submitted by the Contractor and the Contractor's office are hereby designated as places to either of which notices, letters and other communications to the Contractor shall be certified, mailed or delivered. The delivering at the above-named place, or depositing in a postpaid package directed to the first-named place, in any post office box regularly maintained by the Post Office Department, or any notice, letter or other communication to the Contractor, shall be deemed sufficient service thereof upon the Contractor and the date of said service shall be the date of such delivery or mailing. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor and delivered to the Owner's Representative. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter or other communication upon the Contractor personally.

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F. Employees of the Contractor:

1. The Contractor shall employ a competent, experienced Superintendent and Forman to represent him at the several parts of the work. These persons shall be present at all times while the work entrusted to them is in progress and shall be fully informed regarding it. The Superintendent shall be satisfactory to the Owner's Representative and shall represent and have full authority to act for the Contractor in his absence. All other persons employed on the work shall be competent and skillful persons.

G. Safety Precaution Measures (Generally):

1. The Contractor shall take all necessary precautions to conduct his operations in such a manner so as to provide maximum possible safety for all employees on the work and the public as well. The Contractor shall provide suitable barricades, bridges, railings and similar protection around and over excavations and open trenches so as to insure maximum protection. All State and Federal Laws applicable to the work shall receive compliance.
2. The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor to the Owner and the Owner's Representative.

H. Permits and Licenses:

1. The Contractor shall secure and pay for all local town, State, & Federal permits and licenses necessary for the execution of the work.
2. The Contractor shall give such notices, comply with all laws, ordinances, rules or regulations having bearing on the conduct of the work. The Contractor shall indemnify the Owner, its officers and agents against claim or liability arising from failure to comply with such rules, laws or ordinances by himself, his employees or Subcontractors. Fees shall be waived for Municipal permits only.

1.05 – Obligations of the Owner:

- A. The Owner will provide all land and easements necessary for the construction of all permanent structures called for by the Contract. The limits of the land acquired for the permanent construction are shown on the Contract Drawings.

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1.06 – Obligations of the Owner’s Representative:

- A. The Owner’s Representative shall be the interpreter of the requirements of the Contract Documents and the judge of the performance there under by both the Owner and Contractor. The Owner’s Representative shall render interpretations necessary for the proper execution or progress of the work with reasonable promptness on written request of either the Owner or the Contractor, and shall render written decisions, within a reasonable time, on all claims, disputes and other matters in question between the Owner and the Contractor relating to the execution or progress of the work or the interpretation of the Contract Documents.
- B. Interpretations and decisions of the Owner’s Representative shall be consistent with the intent of and reasonably inferable from the Contract Documents and shall be in written or graphic form. In the capacity of interpreter and judge, the Owner’s Representative shall endeavor to secure faithful performance by both the Owner and the Contractor, shall not show partiality to either, and shall not be liable for the result of any interpretation or decision rendered in good faith in such capacity.
- C. The Owner’s Representative shall have authority to reject work that does not conform to the Contract Documents. Whenever, in the Owner’s Representative’s reasonable opinion, it is necessary or advisable for the implementation of the intent of the Contract Documents, the Owner’s Representative will have authority to require special inspection or testing of the work in accordance with the provisions of the Contract Documents, whether or not such work be fabricated, installed or completed.
- D. The Owner’s Representative will not control over, take charge of or, be responsible for 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 responsibility.

1.07 – Site Control and General Protection Measures:

- A. The Contractor shall, at his own expense, protect all work completed or partially completed under this Contract and shall be solely responsible for the care and protection of all materials covered by this Contract. Damage, loss, or injury from any cause whatsoever shall be made good by the Contractor at his own expense. The method of providing against such damage, loss or injury is left to the discretion of the Contractor. All damaged work must be replaced to the satisfaction of the Owner’s Representative at no cost to the Owner.
- B. Utility Protection and "DIG-SAFE" DAMAGE PREVENTION SYSTEM: All Contractors or Subcontractors performing drilling, boring, auguring, jetting, sheeting or pile

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installation, soil preloading for consolidation, demolition, excavation or like work shall, prior to commencement of these activities, shall verify utility locations by contacting DIG SAFE (888-DIG-SAFE (344-7233) or dial 811), in accordance with the laws of the State of RI.

1. Contractor shall be responsible for injury to water pipes, gas pipes, oil pipes, electrical wires, conduits, drains, sewers, fiber optic cables and other structures that may be met within the project area, owned by individuals, by firms or corporations, or by the municipality. Contractor shall be liable for damages to public or private property resulting there from.
2. Shore or sling up in their places, without injury, gas pipes, water pipes, oil pipes, gasoline pipes, electrical conduits and other structures, public service owned, or controlled by individuals, firms or corporations, which may be intercepted during and by work under this Contract. Maintain them in constant operation except as may be required to connect and disconnect from them.

1.08 – Weather Conditions:

- A. No work shall be done when in the opinion of the Owner's Representative the weather is unsuitable. In no instance shall concrete, earth backfill, paving or embankment be placed upon frozen material. The Contractor shall be responsible for the protection of all completed or partially completed work as a result of extreme weather conditions. The Contractor shall be fully aware of the extremes of weather conditions in the area in regards to the depth of frost and snowfall, and the degree and length of sub-freezing temperatures during the winter season. If there is delay or interruption in the work due to weather conditions, the necessary measures must be taken to bond new work to old. Only such work as will not suffer injury to workmanship or materials will be permitted in inclement weather.
- B. Should tornado, hurricane, gale or heavy wind warnings be issued, the Contractor shall take every practicable precaution to minimize the danger to persons, to the work, and to adjacent properties. Such damage caused to any part of the work shall be rectified or replaced to the complete satisfaction of the Owner's Representative and at no expense to the Owner. Injury to personnel or damage to adjacent property because of the work shall be the complete responsibility of the Contractor, and he accepts exclusive liability for same.

1.09 – Loading:

- A. No part of any work involved in this Contract shall be loaded during construction with a load greater than it is calculated to carry with safety. Should any accidents or

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damage occur through any violation of this requirement, the Contractor shall be held responsible under his Contract and Bond.

1.10 – Partial Occupancy:

- A. The Owner shall have the right to take possession of or use any part of the completed or partially completed work prior to final acceptance.
- B. Should Partial Occupancy be desired by Owner, the Owner will give notice thereof to Contractor, and such occupancy shall be upon the following terms:
 - 1. The occupancy or use of any area shall not constitute acceptance of work not performed in accordance with the Contractor, nor relieve Contractor of liability to perform any work required by Contract but not completed at time of said occupancy.
 - 2. The general guarantee period, called for in General Conditions, for work substantially completed shall not begin to run until issuance of certificate by Owner's Representative.
 - 3. Contractor shall be relieved of all maintenance costs on portions occupied under this Agreement.
 - 4. Contractor shall not be responsible for wear and tear or damage resulting from Partial Occupancy as agreed to by Owner and Contractor.
 - 5. Owner shall assume risk of loss with respect to any portion occupied by it under the terms of this Agreement. However, Contractor shall assume full responsibility for loss or damage traceable to his fault or negligence in the performance of his Contract.

1.11 – Materials and Workmanship:

- A. All work shall be done in a neat, workmanlike manner. All materials, equipment and workmanship shall fully conform to the requirements of the Contract Documents and shall be in every respect in accordance with the best modern practice. All materials and equipment shall be new and of standard first-grade quality and design. Materials and equipment shall be assembled and erected in a neat, workmanlike manner and in proper level and alignment.

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1.12 – Other Requirements:

- A. Grades, Lines and Layout:
 - 1. Contractor shall determine the finish grades and lines in the field as provided by the elevations of the existing grades and surfaces specified to remain.
 - 2. Deviation from established grades or lines determined by the elevations of the existing grades and surface, etc., specified to remain, will not be permitted except by written approval of Owner’s Representative, or unless obvious error exists in designated grades or lines.
- B. Water: The Contractor shall not operate any valves nor tie-into the water service unless approval has been received from the Owner.
- C. Electric: The Contractor shall not tie-into the electric service unless approval has been received from the Owner and appropriate Utility Company(ies).
- D. Environmental Regulations: The Contractor shall conform operations to all applicable environmental regulations.

End of Section

MODIFICATION PROCEDURES

Section 01035

Part 1 – General:

1.01 – Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section 01010 "Summary of Work" for requirements for the Contractor's Construction Schedule.
 - 2. Division 1 Section 01631 "Substitutions" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.02 – Minor Changes in the Work:

- A. Minor changes in the Work, not involving adjustment to the Contract Sum or Contract Time/Schedule may be requested by the Owner or Owner's Representative. Should such minor changes be requested, Owner's Representative will issue supplemental instructions authorizing this work.

1.03 – Change Order Proposal Requests:

- A. Owner-Initiated Proposal Requests: The Owner's Representative will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal requests issued by the Owner's Representative are for information only. Do not consider them as an instruction either to stop work in progress or to execute the proposed change.
 - 2. Within 1 day of receipt of a proposal request, submit an estimate of cost necessary to execute the change to the Owner's Representative for the Owner's review.
 - 3. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

MODIFICATION PROCEDURES

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4. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 5. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.
- B. Contractor-Initiated Proposals: When latent or unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Owner's Representative.
1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 2. Include a list of quantities of products required and unit costs, with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Comply with requirements in Section 01631 "Substitutions" if the proposed change requires substitution of one product or system for a product or system specified.
- C. Change Order/Proposal Request Form: All Change Order Documentation shall be provided by contractor on appropriate standardized AIA forms.

1.04 – Construction Change Directive:

- A. Construction Change Directive: When the Owner and the Contractor disagree on the terms of a Proposal Request, the Owner's Representative, upon request by the Owner, may issue a Construction Change Directive on appropriate AIA Form. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. The Construction Change Directive contains a complete description of the change in the Work. It also designates the method to be followed to determine change in the Contract Sum or Contract Time.

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- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and times adjustments to the Contract.

1.05 – Change Order Procedures:

- A. Upon the Owner's approval of a Proposal Request, the Contractor will issue a Change Order for signatures of the Owner and the Owner's Representative. Use appropriate AIA standardized documents for Change Order Proposals.

Part 2 - Products (Not Applicable)

Part 3 - Execution (Not Applicable)

End of Section

Part 1 – General:

1.01 – Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 01010 “Summary of Work”
 - 2. Section 01340 "Shop Drawings, Product Data, and Samples"
 - 3. Section 01700 "Contract Closeout”
 - 4. Section 01720 “Project Record Documents”
 - 5. Structural drawings and Shop Drawings Provided by Contractor

1.02 – Summary:

- A. The Contractor shall acquire and bear the cost of the services of a licensed Land Surveyor, when required, to establish the Benchmarks and position of the proposed new site features. Refer to the Construction Documents for further information.
- B. General: This Section specifies administrative and procedural requirements for field-engineering services, when required throughout the construction of this project, including, but not limited to Layout Engineering Services, and As-Built Drawing Preparation.

1.03 – Submittals:

- A. Certificates: If requested, submit a certificate signed by the land surveyor or professional engineer certifying the location and elevation of improvements.
- B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of section 01700 "Project Closeout" and Section 01720 “Project Record Documents” Section.

1.04 – Quality Assurance:

- A. Survey Qualifications: Surveyor Engaged by the Contractor shall be a surveyor licensed in Rhode Island, with active Certificate of Authorization from the State to perform required engineering services. Upon request, Contractor shall supply the Owner with all documentation of licensing and/or qualifications.

Part 2 – Products (Not Applicable)

Part 3 – Execution

3.01 – Examination:

- A. Identification: The Surveyor will locate and identify existing control points on the project site. Refer to Contract Drawings for original control points and establish additional or temporary controls as necessary. Coordinate with authorities as necessary for traffic control and/or access to areas outside of the identified Limit of Disturbance as noted on plans.
- B. Contractor to make themselves aware of existing field conditions and project site and verify layout information shown on the Drawings, in relation to those conditions, before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
 - 1. Do not change or relocate benchmarks or control points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.
 - 2. Promptly replace lost or destroyed Project control points. Base replacements on the original survey control points.
- C. Establish and maintain a minimum of 2 permanent benchmarks on the site, referenced to data established by survey control points.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- D. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction – refer to Section 01010 of these Specifications for DIG-SAFE Utility Verifications.

FIELD ENGINEERING

Section 01050

1. Prior to construction, the Contractor shall verify the location of sanitary sewer, storm sewer, water-service piping, electric conduit and /or all other under ground components, so as to not impose damage to any existing under ground utilities and/or structures.

3.02 – Performance:

- A. Work from lines and levels established by the existing conditions survey. Establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
 1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
 2. As construction proceeds, check every major element for line, level, and plumb.
- B. Surveyor's Log: Maintain a surveyor's log of control and other survey work. Upon request, this log shall be available for reference to the Owner, Owner's Representative, and any local, State, or Federal Regulatory Staff.
 1. Record deviations from required lines and levels, and advise the Project Manager and Owner's Representative when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted and not corrected.
- C. Existing Utilities: Furnish information necessary to adjust, move, or relocate existing structures, utility poles, lines, services, or other appurtenances located in or affected by construction. Coordinate with local authorities having jurisdiction.

End of Section

Part 1 - General:

1.01 – General Permitting:

- A. The Contractor shall abide by all local, state, and federal regulations and regulatory authorities for all aspects of this project, including, but not necessarily limited to local building code, Rhode Island Department of Environmental Management (RIDEM) regulations, Local Utility Commissions, RI Governor’s Commission on Disabilities, The Americans with Disabilities Act, and Conservation and Preservation Authorities.

- B. Because this project is funded with federal funds, additional requirements apply such as, but not limited to, the following: Section 3 hiring goals and reporting, Equal Opportunity, WBE & MBE goals, Section 504 regulations regarding accessibility requirements, Davis-Bacon Act, as amended (40 U.S.C. 3141–3148), Contract Work Hours and Safety Standards Act (40 U.S.C. 3701–3708), Rights to Inventions Made Under a Contract or Agreement, Clean Air Act (42 U.S.C. 7401–7671q.), the Federal Water Pollution Control Act (33 U.S.C. 1251–1387), as amended, Energy Policy and Conservation Act (42 U.S.C. 6201), Byrd Anti-Lobbying Amendment (31 U.S.C. 1352), Environmental Compliance (24 CFR 85.36(i)(12). These requirements will be made a part of any contract entered into for this Project.

1.02 – Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

Part 2 – Products (Not Applicable)

Part 3 – Execution (Not Applicable)

End of Section

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Part 1 – General:

1.01 – Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 – Definitions:

- A. General: Defined below are Terms utilized throughout these project specifications and Contract Documents. Additionally, basic contract definitions may be included in the Conditions of the Contract between Owner and Contractor.
- B. Definitions:
 - 1. Approved: The term "approved," when used in conjunction with the Owner's Representative's action on the Contractor's submittals, applications, and requests, is limited to the Owner's Representative's duties and responsibilities as stated in the Conditions of the Contract.
 - 2. Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Owner's Representative, requested by the Owner's Representative, and similar phrases.
 - 3. Experienced: The term "Experienced", or "Experience" when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
 - 4. Furnish: The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
 - 5. Indicated: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
 - 6. Install: The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying,

REFERENCE STANDARDS AND DEFINITIONS

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working to dimension, finishing, curing, protecting, cleaning, and similar operations.

7. Installer: The term "installer" refers to the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 8. Project Site: The term "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
 9. Provide: The term "provide" means to furnish and install, complete and ready for the intended use.
 10. Regulations: The terms "regulations", "regulators", and "regulatory", include laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
 11. Testing Agencies: The terms "testing agency" or "testing agencies", refer to an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- C. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
- D. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
1. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to

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interfere with local trade-union jurisdictional settlements and similar conventions.

1.03 – Specification Format and Content Explanation:

- A. Specification Format: These Specifications are organized, generally, into Sections and Divisions based on CSI's 16-Division format. Where variations exist between the format of these specifications and those of the Standard CSI Format, the organization of these Contract Documents shall take precedence. In all Project Records, Contractor shall refer to any specifications by the codifications utilized in these specifications.

- B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:
 - 1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

 - 2. Streamlined Language: These Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

 - 3. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

1.04 – Industry Standards:

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents.

REFERENCE STANDARDS AND DEFINITIONS

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AISI	American Iron and Steel Institute 1101 17th St., NW Washington, DC 20036-4700	(202) 452-7100
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036	(212) 642-4900
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187	(215) 299-5400
FM	Factory Mutual Systems 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062	(617) 762-4300
NEC	National Electrical Code (from NFPA)	
NECA	National Electrical Contractors Assoc. 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814	(301) 657-3110
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(617) 770-3000
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(708) 272-8800

2. Federal Government Agencies: Names and titles of federal government standards, or Specification producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standards or Specification producing agencies of the federal government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

REFERENCE STANDARDS AND DEFINITIONS

Section 01095

OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
200 Constitution Ave., NW
Washington, DC 20210

(202) 219-6091

1.05 – Submittals:

- A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

Part 2 - Products (Not Applicable)

Part 3 - Execution (Not Applicable)

End of Section

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

Part 1 – General:

1.01 – Requirements Included:

- A. Submit Shop Drawings, Product Data and Samples required by the Contract Documents.
- B. Shop Drawings:
 - 1. Drawings shall be presented in a clear and thorough manner.
 - 2. Shop Drawings and Details shall be identified by reference to sheet and detail shown on Contract Drawings, or Contract Specification Section and Subsection.
 - 3. Minimum Sheet Size: 8-1/2 inch by 11 inch.
- C. Product Data:
 - 1. Preparation:
 - a. Clearly mark each copy to identify pertinent products or models.
 - b. Product Data shall be identified by reference to sheet and detail shown on Contract Drawings, or Contract Specification Section and Subsection.
 - c. Show performance characteristics, capacities and efficiencies, as well as showing dimensions and clearances required.
 - d. Where applicable, show utility, wiring, or piping, etc., diagrams and controls as may be appropriate.
 - 2. Manufacturer's Standard Schematic Drawings and Diagrams:
 - a. Modify Drawings and Diagrams to delete information that is not applicable to the work.
 - b. Supplement standard information to provide information specifically applicable to the work.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

D. Samples:

1. Office samples: Samples shall be of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of the product, with integrally related parts and attachment devices.
 - b. Full range of color, texture and pattern.
2. Field Samples and Mark-ups: Contractor shall erect, at the project site, at a location acceptable to the Owner's Representative.
3. Size or Area: That specified in the respective Specification Section.
4. Fabricate each sample and mark-up complete and finished.
5. Remove mark-ups at conclusion of work or when acceptable to the Owner's Representative.

1.02 – Contractor Responsibilities:

- A. Review Shop Drawings, Product Data and Samples prior to submission.
- B. Determine and Verify:
 1. Field measurements.
 2. Field construction criteria.
 3. Catalog numbers and similar data.
 4. Conformance with Specifications.
- C. Coordinate each submittal with requirements of the work and of the Contract Documents.
- D. Notify the Owner's Representative in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents, stating the difference in value between the Contract Requirements and those illustrated on the Shop Drawings submitted for review.
- E. No fabrication or work which requires submittals shall begin until submittals are reviewed and approved by Owner's Representative.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

1.03 – Owner’s Representative Duties:

- A. The Owner’s Representative will check and review Shop Drawings, Product Data, and Submittals only for conformance with the Design Concept and for compliance with information given in the Contract Documents. Review by the Owner’s Representative of submittals is only for general conformance with the design concept of the project and general compliance with the information in the Contract Documents. Any approval or denial of submittals is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be fabricated and correlated at the job site, fabrication processes and techniques of construction, coordination of his work with that of all other trades, and the satisfactory performance of his work to fulfill the requirements and intent of the Contract Documents. Such review will not relieve the Contractor from responsibility for errors of any sort in the Shop Drawings, nor for the proper coordination of any such submittal with all other work.

- B. Following review, the Owner’s Representative will affix a stamp and initials or signature indicating determinations made for each submittal in accordance with the following classifications:
 - 1. "Approved", indicates that the Submittal is Approved by the Owner’s Representative noting no exception to the intent of the Contract Documents. Fabrication or ordering of item may commence.

 - 2. "Approved with Changes Noted", indicates that the Submittal is Approved by the Owner’s Representative with minor corrections or additions noting no exception to the intent of the Contract Documents. No further review of submittal is required and item may be fabricated or ordered on basis of and following the corrections noted.

 - 3. "Revise and Resubmit" indicates that no fabrication may be commenced, and that the Contractor must resubmit the Submittal to the Owner’s Representative only after appropriate revisions are made to meet the intent of the Contract Documents.

 - 4. "Rejected" indicates the Submittal’s non-conformance with the Contract Requirements, or that too many corrections would be necessary to meet the intent of the Contract Documents. The Owner’s Representative will state the reasons for rejection.

- C. Following Review and Determinations made, Stamped Submittals are to be returned to the Contractor for their file, distribution, and/or for resubmission.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

1.04 – Contractor’s Submission Requirements:

- A. Make submittals promptly in accordance with reviewed schedule, and in such sequence as to cause no delay in the work or in the work of any other Contractor.
- B. No submittals will be accepted by the Owner’s Representative if transmitted via FAX Machine.
- C. Scheduling of Submittals: Scheduling of Submittals shall be the responsibility of the Contractor, and shall be so submitted in proper sequence, in order of appropriate lead-time of fabrication and priority of construction procedures, following a logical schedule of construction procedures. Such scheduling shall allow reasonable time for review, revisions, resubmission, and rechecking where required, until material submitted is acceptable to Owner’s Representative. Contractor shall schedule submittals to allow the Owner’s Representative adequate time for checking and processing. Such submittal schedule dates shall recognize the possibility of rejections and/or required resubmission. Such schedules shall be subject to change from time to time, as required, by mutual agreement of the Owner’s Representative and the Contractor.
- D. No work shall commence in the shop or on the job nor shall material be delivered to the site until pertinent Shop Drawings have been reviewed and approved by the Owner’s Representative.
- E. Product Specific Items, Equipment, or Materials: Specific manufacturers' names and catalog numbers are used herein to establish quality and design of a particular item. Where items, equipment, or materials in the Plans and Specifications reference a particular brand, manufacturer, or trade name, it is understood that a reviewed and approved equal product may be substituted by the Bidder or Contractor only following approval by the Owner’s Representative.
- F. If the Contractor proposes to use a material which deviates in any way from the detailed requirements of the Contract Documents, he shall inform the Owner’s Representative in writing of the nature of such deviations at the time the material is submitted for review. Contractor shall request a review of the deviation from the requirements of the Contract Documents. Proposed Deviated Material must be suitable for the intended use, and Contractor must provide evidence of this when the request is made, and prior to review by Owner’s Representative
 - 1. Evidence provided by Contractor shall lead to a reasonable certainty that the proposed substitution or deviation will provide a result at least equal in quality to that specified. If, in the opinion of the Owner’s Representative, the evidence presented by the Contractor does not provide a sufficient basis for such

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

reasonable certainty, the Owner's Representative will reject such substitution or deviation without further investigation. The Contractor must then resubmit with a material which meets the Project Specifications.

- G. A Contractor or Subcontractor who carries the cost of a substituted product in his Bid with no prior review by the Owner's Representative, does so at his own risk. The Owner's Representative is in no way obligated to review nor allow a substitution to be furnished. The Contractor shall submit all requests for substitutions sufficiently ahead of need to cause no delay in the job because of the subsequent rejections and/or resubmissions.
- H. Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the Contractor, notwithstanding review or acceptance of such substitution by the Owner or the Owner's Representative, unless such substitution was made at the written initiation of the Owner. Any additional cost for redesign of any components for a substituted product shall be borne by the Contractor unless such substitution was initiated in writing by the Owner.
- I. Only Shop Drawings or Submittals received from the General Contractor will be considered for review by the Owner's Representative. All Shop Drawings or Submittals prepared by Subcontractors shall be processed through the General Contractor in the same manner as stipulated in the paragraphs above. The General Contractor shall check all Shop Drawings and Submittals for conformity with the Contract Documents and particularly for field measurement and proper fit with adjoining work prior to submitting same to the Owner's Representative for review. Certification shall appear on each Shop Drawing or Submittal stating that the General Contractor has made this check. Terms such as "by others" or "not by (this supplier or Subcontractor)" shall not be used on Shop Drawings or Submittals; the Contractor shall state by whom related items are to be furnished, supplied, and/or installed. The Owner's Representative reserves the right to reject and return to the Contractor, without examination, any Shop Drawings or Submittals which have not been previously checked and certified by the General Contractor, or which in any way obviously are not in conformity with Contract Requirements.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

J. Shop Drawings:

1. Shop Drawings shall show the design, dimensions, connections, and other details necessary to insure that they accurately interpret the contract Documents and shall show adjoining work in such detail as required to provide proper connection with same. Where adjoining work also requires Shop Drawings, they shall be submitted for review at the same time to ensure that connections can be accurately checked.
2. Submit two (2) legible blackline prints of each Shop Drawing with sufficient blank space (minimum 4 inches by 2 inches) for the Owner's Representative's annotations and review stamp, except as otherwise called for herein. The Shop Drawing(s) shall be delivered to the Owner's Representative in flat or roll form. The Owner's Representative will make annotations directly on the blackline, stamp same with appropriate review, and return original to the Contractor.
3. Shop Drawings marked "Approved" or " Approved with Changes Noted" shall be used by the General Contractor to obtain and distribute the prints necessary for fabrication and construction. They shall then be copied and returned to vendor or Subcontractor from whom they were originally received.
4. Shop Drawings marked "Revise and Resubmit" or "Rejected" shall be used by the General Contractor to make a record print and then copied and returned to vendor or Subcontractor who made the submittal for corrections required. Submittals marked "Rejected" or "Revise and Resubmit" shall not be sent to job site or used for shop fabrication.
5. This procedure shall be repeated until all corrections are made to the satisfaction of the Owner's Representative. The reviewed Shop Drawing(s) will be returned to the Contractor who in turn will be responsible for making prints in sufficient numbers for his own and his Subcontractors' use.

K. Product Data:

1. Submit two (2) legible copies with sufficient blank space (minimum 4 inches by 2 inches) for the Owner's Representative's annotations and review stamp, except as otherwise called for herein.
2. Data sheets shall show illustrated cuts of item to be furnished, scale details, dimensions, capacity, performance, characteristics, efficiencies, wiring diagrams, controls, and other pertinent information, as applicable. If more than one type of size is shown on these sheets, the item being submitted shall be clearly denoted.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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3. Product Data Submittals marked "Approved" or " Approved with Changes Noted" shall be used by the General Contractor to obtain and distribute the prints necessary for fabrication and construction. They shall then be copied and returned to vendor or Subcontractor from whom they were originally received.
4. Product Data Submittals marked "Revise and Resubmit" or "Rejected" shall be used by the General Contractor to make a record print and then copied and returned to vendor or Subcontractor who made the submittal for corrections required. Submittals marked "Rejected" or "Revise and Resubmit" shall not be sent to job site or used for shop fabrication.
5. This procedure shall be repeated until all corrections are made to the satisfaction of the Owner's Representative. The reviewed Product Data Submittal(s) will be returned to the Contractor who in turn will be responsible for making prints in sufficient numbers for his own and his Subcontractors' use.

L. Samples:

1. Each Sample submitted by the Contractor shall clearly note the appropriate Specification Section, as noted in these specifications.
2. Samples and related certificates shall be delivered to location designated by Owner's Representative. Samples requiring testing should be submitted to testing laboratory with adequate time to provide approximately twenty (20) days following completion of testing, and from date of receipt of results by Owner's Representative to date of completion of review by Owner's Representative.
3. Each sample shall be labeled to indicate material, trade name, place or origin, name of producer, name of Contractor, name of project, and Specification section correlated to these specifications. Samples must be packaged and delivered in such a manner as to reach destination in good condition. Letter of transmittal shall accompany samples and shall include certificate as to compliance with Contract Requirements.
4. No materials submitted for review and/or testing shall be delivered to Project Site until reviewed and approved by Owner's Representative.
5. Review of samples shall be deemed to be general only, and shall not constitute waiver of Owner's rights to demand full compliance with Contract Requirements. After actual delivery of material to site, Owner's Representative will make such inspection and testing as deemed necessary, and may reject such materials,

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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equipment and accessories for cause, even though such items may have been given general review.

6. When a sample has been designated "Approved" or " Approved with Changes Noted", no change in brand or make may be made unless manufacturer fails to make satisfactory delivery or the delivered material fails to conform with Contract Requirements.
7. If materials, equipment or accessories which fail testing have been incorporated in work, Owner shall have the right to demand their removal and replacement by proper materials, or to demand and secure such reparation by Contractor as is equitable at the Contractor's expense.
8. Samples designated as "Rejected" or "Revise and Resubmit" will be returned to Contractor upon request, and at his expense, within thirty (30) days after rejection.

M. Submittals, Unless Otherwise Noted, Shall Contain:

1. The date of submission and the dates of any previous submissions.
2. The project title and number.
3. Contract identification and/or Correlating Specification Section(s).
4. The names of: Contractor, Supplier, and Manufacturer
5. Field dimensions, clearly identified as such.
6. Relation to adjacent or critical features of the work or materials.
7. Applicable standards, such as ASTM or Federal Specification Numbers.
8. Identification of deviations from Contract Documents.
9. Identification of revisions on resubmittals.
10. An 4" x 2" blank space for Owner's Representative stamps.
11. Contractor's stamp, initialed or signed, certifying their review of submittal, and other pertinent information such as verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

1.05 – Resubmission Requirements:

- A. Make any corrections or changes in the submittals required by the Owner's Representative and resubmit until they are denoted "Approved" or "Approved with Changes Noted" by the Owner's Representative.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

B. Resubmitted Submittals:

1. Contractor shall revise initial drawings or data and resubmit as specified by the Owner's Representative on the returned initial submittal.
2. Contractor shall indicate any changes which have been made other than those requested by the Owner's Representative.

C. Resubmitted Samples:

1. Contractor shall submit new samples as required by Owner's Representative on the returned initial submittal.

1.06 – Distribution:

- A. Contractor shall Distribute reproductions of Shop Drawings and copies of product data which carry the Owner's Representative stamp denoting "Approved" or "Approved with Changes Noted" to:
1. Job Site File.
 2. Record Documents File.
 3. Other Affected Contractors.
 4. Subcontractors.
 5. Supplier or Fabricator.
 6. As directed by the Owner's Representative

1.07 – Operation, Instruction, and Maintenance Manual:

- A. Two (2) bound copies of the Operation, Instruction, and Maintenance Manual shall be submitted to Owner's Representative for approval prior to beginning of Contract Closeout Procedures (See Section 01700 of this Project Manual). If the Manual is satisfactory, submit five (5) copies of the final manual as directed by Owner's Representative. If the Manual is not satisfactory, one (1) copy will be returned to the Contractor. When unsatisfactory Manuals are resubmitted, two (2) copies will again be required. Upon final acceptance by the Owner's Representative, submit five (5) bound copies of the final manual as directed by Owner's Representative.
- B. All elements and components of the equipment installed or furnished as part of the project shall be included in the Manual including a description of how the equipment or complete system works. Additionally, where a number of components are furnished to provide a complete system, the operation of the components as they relate to the complete system shall be described.

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Section 01340

- C. The Manual shall include all necessary instruction for the maintenance and operation of the equipment installed or furnished as part of the project in accordance with the manufacturer's recommendations. The Manuals shall include, but not limited to the following:
1. Index or Table of Contents.
 2. A complete written description of the operation of the equipment.
 3. Clear and concise maintenance instruction including schedules and types of finishes.
 4. Detailed drawings.
 5. Plumbing and/or wiring diagrams and control schematics including connection diagrams, as appropriate.
 6. Complete parts lists including the specific part or identification number utilized by the manufacturer of the parts.
 7. Recommended spare parts list.
 8. Current parts price list.
 9. All calibrations and other data for future modifications, alterations or reconfigurations shall be completely indicated and described.
 10. Pages are to be numbered consecutively through all sections of the Manual.
 11. Shop Drawing submittal data.
- D. Only data pertaining to the specific equipment installed or furnished as part of the project shall be included.
- E. The Manual(s) shall be bound in a heavy gauge three (3) ring vinyl binder with a minimum of two (2) interior vinyl pockets, or similar binding approved by the Owner. The color of the manual front and back cover will be chosen by the Owner.
- F. The Manual(s) shall be identified by title on the front cover, back cover and spine and shall include the Name of Project, Name of Owner, Title of Manual (identifying type or name of equipment), and Project Completion Date.

End of Section

SCHEDULE OF VALUES

Section 01370

Part 1 – General:

1.01 – Related Requirements:

- A. Conditions of the Contract between Owner and Contractor.
- B. Section 01035 “Modification Procedures”
- C. Section 01700 “Contract Closeout”
- D. Section 01720 “Contract Record Documents”

1.02 – Form and Content of Schedule of Values:

- A. Submit Schedule of Values in duplicate, as soon as practicable after notification of selection for the award of Contract, and prior to the Scheduled Pre-Construction Meeting and start of work.
- B. Submit typed schedule on AIA Form G703 – Application and Certificate for Payment, Continuation Sheet. Identify schedule by including AIA Form G702, filling all the blanks in the upper portion.
- C. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- D. Elements included on Schedule of Values shall follow the Codification and Table of Contents as noted in this Project Manual as the format for listing and identifying component items.
- E. For each major line item list sub-values of major products or operations, as appropriate or requested by Owner’s Representative, under the line.
- F. For the various portions of the work:
 - 1. Each item shall include a directly proportional amount of the Contractor’s overhead and profit.
 - 2. For items on which progress payments will be requested for stored materials, break down the value into:

SCHEDULE OF VALUES
Section 01370

- a. The cost of materials, delivered and unloaded
 - b. The total installed value.
3. Submit schedule values of work prior to application for payment for such work.
- G. The sum of all values listed in the schedule shall equal the total Contract Sum.
- H. Revise schedule to list approved Change Orders, with each Application for Payment.

End of Section

Part 1 – General:

1.01 - Inspection and Tests:

- A. In addition to those components of the project specifically outlined in the Contract Documents for specialized testing and submittals, the Contractor shall not use any material or equipment in the work which has not been inspected and reviewed by reputable professionals qualified to review such materials and/or equipment. Ample time and opportunity shall be given the Owner's Representative for testing materials to be used in the work, should the Owner's Representative request additional testing. The Contractor shall promptly advise the Owner's Representative upon the placing of orders for materials so that arrangements may be made, if desired, for the testing of materials at the place of manufacture.
- B. The Owner may decide to have some or all of the materials inspected or tested as required. The Contractor shall furnish all samples, labor, materials and equipment necessary for the inspection and tests required and should anticipate possible delays caused by this testing and acceptance procedure. Scheduling shall be coordinated as necessary and the project schedule adapted, if needed.
- C. Seals and Pressure Testing: All piping, pumps and like equipment transporting liquid shall be first tested with water and then with the material they will carry when in final operation. The Contractor shall pay for all electric power and fuel necessary for the operation of all mechanical equipment prior to completion of the Contract. All equipment and appliances shall be subject to acceptance tests prior to final payment.
- D. The Owner's Representative or any person employed by him in connection with the work shall, at any time, have the right to enter upon the work and inspect the work and any materials being used in the work. Contractor shall provide ample time and facilities for such inspection. The contractor also shall provide all reasonable facilities for viewing the work by the owner or any representatives or Agencies having jurisdiction in regard to the work.

QUALITY CONTROL
Section 01400

1.02 – Experience of Equipment Manufacturer:

- A. Whenever it is written that an equipment manufacturer must have a specified period of experience with his product, a manufacturer who does not meet with the specified experience period can be considered. However, such manufacturer shall only be considered if the equipment supplier or manufacturer is willing to provide a Bond or Cash Deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

End of Section

TESTING LABORATORY

Section 01410

Part 1 – General:

1.01 – Requirements Included:

- A. Unless otherwise noted or required to be conducted by third parties or the Contractor by these Contract Documents or other sections of these Specifications, Owner will employ and pay for the services of an independent testing laboratory, as recommended by the Owner's Representative, to perform specified testing.
 - 1. If testing (or additional testing) is required, Contractor shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the Contract, in accordance with the requirements of the Contract Documents.

- B. Owner will employ services of an independent testing laboratory, as recommended by Owner's Representative to perform specified testing on any material which the Owner or Owner's Representative feels may not comply with Contract Document Requirements.
 - 1. If results of these tests show that material does not conform to the requirements of the Contract Documents, the cost of testing shall be borne by the Contractor.
 - 2. If results of these tests show the material does conform to the requirements of the Contract Documents, the cost of testing shall be borne by the Owner.

1.02 – Qualification of Laboratory:

- A. Laboratory facilities, personnel, and materials must meet the "Recommended Requirements For Independent Laboratory Qualification", Published by the American Council of Independent Laboratories.
- B. Laboratory facilities, personnel, and materials must meet basic qualifications of appropriate ASTM testing requirements.
- C. Laboratory facilities and personnel, etc. shall be authorized to operate in the State, and municipality in which the project is located.
- D. Laboratory must submit a copy of Report of Inspection of Facilities made by materials referenced laboratory of National Bureau of Standards during the most recent tour of

TESTING LABORATORY

Section 01410

inspection, with memorandum of remedies of any deficiencies reported by the inspection.

- E. Testing Equipment: All Equipment must be calibrated at reasonable intervals by devices of accuracy traceable to either:
 - 1. National Bureau of Standards
 - 2. Accepted values of natural physical constants

1.03 – Laboratory Duties:

- A. Laboratory and Personnel shall cooperate with Owner's Representative and Contractor and provide qualified personnel after due notice.
- B. Laboratory shall notify Owner's Representative promptly after review of Contractor's proposed design mixes for concrete and other material mixes which require control by the testing laboratory so that Owner's Representative can approve, disapprove or modify them.
- C. Laboratory and/or testing agency shall secure adequate quantities of representational samples of materials proposed to be used and which require testing. Laboratory must furnish incidental labor and facilities to obtain and handle samples at the project site or at the source of the product to be tested.
- D. Laboratory and/or testing agency shall perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of Contract Documents.
- E. Laboratory and/or testing agency Promptly notify Owner's Representative and Contractor of observed irregularities or deficiencies of work or products.
- F. All work will be checked as it progresses, but failure to detect defective work or materials shall in no way prevent later rejection when such defect is discovered. Failure to detect defective work shall not obligate Owner's Representative for final review.
- G. Laboratory and/or testing agency personnel shall promptly submit typed or legibly printed report of each test and inspection. Distribution of reports shall be as

TESTING LABORATORY Section 01410

determined at a Preconstruction Meeting between the Owner's Representative, Contractor and Representative of the Testing Laboratory. Each report shall include:

1. Date Issued.
 2. Project Title and Number.
 3. Testing Laboratory Name, Address, Email and Telephone Number.
 4. Name, Title, and Signature of Laboratory Inspector.
 5. Date, Time, and Location of Sampling or Inspection.
 6. Record of Temperature and Weather Conditions.
 7. Identification of Product and Specification Section.
 8. Type of Inspection or Test.
 9. Results of Tests and Determination of Compliance with Contract Documents.
 10. Further Interpretation of Test Results, when requested by Owner's Representative.
- H. Laboratory and/or testing agency shall perform additional tests as required by Owner's Representative or Owner if there is cause for concern that a particular material may not comply with Contract Document Requirements.

1.04 – Limitations of Authority of Testing Laboratory:

- A. Laboratory Is Not Authorized To:
1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 2. Approve or accept any portion of the work.
 3. Perform any duties of the Contractor.

1.05 – Contractor's Responsibilities:

- A. Use of testing services shall in no way relieve Contractor of responsibility to furnish materials and construction in compliance with Plans and Specifications.
- B. Contractor shall cooperate with laboratory personnel, and provide access to work and to manufacturer's operations.
- C. Contractor shall provide to the laboratory and the Owner's Representative for review, the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.
- D. Contractor shall furnish copies of product test reports as required.
- E. Contractor shall furnish all Incidental Labor and Facilities to:

TESTING LABORATORY

Section 01410

1. Provide access to work to be tested.
 2. Facilitate inspections and tests.
 3. Store and cure test samples, as required.
- F. Contractor must notify laboratory sufficiently in advance of operations to allow for laboratory assignments of personnel and scheduling of tests. Procedure shall be as determined at a Preconstruction Meeting between Owner's Representative, Contractor and Testing Laboratory Representative.
1. When tests or inspections cannot be performed after such notice, promptly notify Owner's Representative and reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence. No claims for delays shall be allowed if work must be rescheduled due to the unavailability of laboratory personnel.
- G. Contractor shall employ and pay for the services of the same or a separate, equally qualified independent testing laboratory, approved by the Owner and Owner's Representative, to perform additional inspections, sampling and testing required for the Contractor's convenience or when initial tests indicate work does not comply with the requirements of the Contract Documents.

1.06 – Specific Tests, Inspections and Methods Required:

- A. Refer to other Sections of the Specifications for specific Testing and Inspection requirements of materials.

End of Section

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Section 01500

Part 1 – General:

1.01 – Requirements Included:

- A. Contractor shall furnish, install and maintain construction facilities and temporary controls required for construction, as specified herein, and remove said construction facilities and temporary controls on completion of work.

1.02 – Regulatory Agencies:

- A. Contractor shall comply with all Federal, State and Local Codes, Laws, Ordinances and Regulations and with all pertinent utility company requirements.

Part 2 – Products:

2.01 – Materials, General:

- A. Material may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- B. Contractor shall coordinate any and all interruptions of permanent utilities with utility companies and affected users.

2.02 – Temporary Sanitary Facilities:

- A. Contractor shall provide sanitary facilities in compliance with local, state, and federal laws and regulations. Such facilities shall be properly secluded from public view.
- B. Contractor shall service, clean and maintain facilities and enclosures.

2.03 – Hoisting Facilities:

- A. Contractor shall provide hoisting facilities as required for the vertical movement of all materials.
- B. Contractor and Facilities or Materials shall comply with OSHA, and all local, state, and federal regulations.
- C. Contractor shall maintain all facilities in compliance with the law.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Section 01500

2.04 – Temporary Barriers:

- A. Contractor must provide barricades, guards, coverings, lighting, warning lights and signs as required by Federal, State, and Local Regulations to protect obstructions in streets and sidewalks, open trenches and pits, hazards and like items. Mark and light barricades and guards as required.
- B. The Contractor shall, at times, employ watchmen when such action is required to prevent injury or damage to the public. The contractor shall indemnify and protect the Owner from any damage or injury caused by any act or neglect of the Contractor or his Subcontractors.
- C. Contractor shall comply with OSHA and all local, state, and federal regulations with regard to standards and requirements for guardrails, openings and stairways.

2.05 – Protection:

- A. The contractor shall at all times protect excavations, trenches, new construction, old construction, all job materials, apparatus and fixtures from rain, wind, snow, ice, dust, dirt, mud, ground water, back-up or leakage of sewers, drains, or other piping and from water of any other origin and shall remove promptly any accumulation of the above. Contractor shall provide and operate all pumps, piping and other equipment necessary to this end at no additional cost to Owner.
- B. Contractor shall thoroughly protect all completed work and all stored materials.
- C. When needed, Contractor shall provide boards, cloths, planks, waterproof paper, canvas or other approved protection and use as necessary to prevent any damage.
- D. Contractor must provide protective measures to prevent damage to lawns, trees and shrubs specified to remain after project is complete.
- E. At the end of each day's work, Contractor shall protect such work that may be susceptible to damage by the elements.
- F. Contractor shall replace or rectify work or materials damaged by workmen, by the elements or by any other cause, to the satisfaction of the Owner's Representative at no additional expense to the Owner.
- G. Contractor shall repair streets, curbs, sidewalks, poles, grass, shrubs, trees or other existing site features, if disturbed by construction operations or contractor personnel. Contractor must leave all existing site features specified to remain in as good condition as they were before being disturbed.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Section 01500

- H. Do not allow workmen, including those of any Subcontractor or supplier to mark finished surfaces with marking pens or other such devices which are not readily erasable.

2.06 – Traffic:

- A. The Contractor shall at all times keep roads and sidewalks open for pedestrian and vehicular traffic. The Contractor shall bridge or construct plank crossing over trenches where required or as directed by the Owner's Representative.
- B. When portions of a travel way are made dangerous for the movement of vehicles or pedestrians, the Contractor shall employ a sufficient number of uniformed police officers, flagmen, or traffic men to direct the traffic safely through the area as required by Federal, State, and Local Regulations. If such conditions exist at the close of the working day, a watchman and a sufficient number of flagmen or police officers shall be assigned by the Contractor to direct traffic at night. The work must be planned to avoid such conditions whenever possible. Cost for traffic control shall be included in the Base Bid and born by the Contractor.

2.07 – Security:

- A. The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner or this Contractor, whether or not forming part of the work, located within the limits of work. The contractor shall have full responsibility for the security of such property located in such areas and shall reimburse the Owner for any such loss, damage or injury, except such as may be directly caused by agents or employees of the Owner.

2.08 – Project Access:

- A. Contractor shall provide access from adjacent road, as approved by the Owner, and maintain such access in a safe and neat condition throughout the construction process. Construction Access, as coordinated with Owner, shall be protected throughout construction through use of RIDOT Standard 9.9.0 Construction Access. Contractor shall inspect Construction Access Regularly, and repair access as needed to ensure access meets the standards of RIDOT Standard 9.9.0.
- B. Storage areas shall be as directed and approved by the Owner. Storage areas shall be protected in accordance with Drawings and General Provisions of Contract, including General and Supplementary Conditions, Section 01060 of these Specifications, and Division 2 Specification Sections as they apply to work of this Section.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

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2.09 – Temporary Controls:

- A. Erosion and Sediment Control: Sufficient precautions shall be taken during construction to minimize the run-off of polluting substances such as silt, clay, soils, fuels, oils, calcium chloride or other polluting materials harmful to humans, or other life, into supplies and surface waters of the State as required by Federal, State and Local Regulations. Contractor shall abide by all local, state, and federal regulations and all components of the approved Soil Erosion and Sediment Control Plan.

- B. Control of Snow and Ice: Contractor shall remove snow and ice as required for safety, access, and proper execution of work. Remove snow and ice build-up which endanger structures during construction. Cost for snow and ice removal shall be included in the Base Bid and born by the Contractor. No extra payment will be made for such work.

- C. Dust Control: During periods of dry weather, water, Contractor shall spread calcium chloride or otherwise treat unpaved areas, if necessary, within contract limits in accordance with all local, State and Federal Regulations, and the approved Soil Erosion and Sediment Control Plan, which may be source of dust nuisance. Treatment shall be of sufficient effectiveness to allay dust nuisance.

- D. Trash Control:
 - 1. Contractor shall maintain premises and properties free from accumulation of waste, debris and rubbish caused by operations.
 - 2. Contractor must provide sufficient trash receptacles around site.
 - 3. Contractor shall collect and deposit debris in appropriate and legal collection facilities.
 - 4. Contractor shall remove all debris from the job site on a regular basis.

- E. Hazards Control:
 - 1. Contractor shall store volatile wastes in sealed covered containers, approved for storage of such wastes, in accordance with all local, State, and Federal regulations, and remove wastes from premises daily.
 - 2. Contractor must prevent accumulation of wastes which create hazardous conditions.
 - 3. Contractor shall provide adequate ventilation during use of volatile or noxious substances.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

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4. Should any hazardous waste be caused by the Contractor, the Contractor shall correct the situation in the proper, legal manner and remove and dispose such waste at no loss or cost to the Owner.

F. Cleaning and Disposal:

1. Contractor shall conduct cleaning and disposal operations in compliance with all Local, State, and Federal Ordinances and Anti-Pollution Laws.
2. Contractor must not burn or bury rubbish or waste materials on project site.
3. Contractor must not dispose of volatile wastes such as mineral spirits, oil or paint thinner, etc., in storm or sanitary drains, or waters of the State.
4. Contractor must not dispose of wastes into streams or waterways.
5. Contractor shall maintain cleaning procedures until project or portion thereof is occupied by Owner.

G. Storage Areas:

1. Contractor shall coordinate the allocation of storage areas to the various trades and Subcontractors.
2. All storage areas shall be approved by the Owner's Representative.
3. Contractor must maintain all storage areas in a clean condition at all times.
4. Field houses, storage sheds, and work facilities for workmen shall be the responsibility of the Contractor or their Sub-Contractors and shall be removed by them following construction procedures for each task these facilities may be needed.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Section 01500

Part 3 – Execution:

3.01 – General:

- A. Contractor must maintain and operate temporary utility systems, where necessary, to assure continuous service. Such temporary utility systems must be modified and extended by the Contractor as work progress requires.

3.02 – Length of Trench to be Opened:

- A. The length of trench to be opened at any time, from the point where ground is being broken to completed backfill, and also the amount of space in streets or public and private lands occupied by equipment, trench and supplies, shall not exceed the length or space considered reasonably necessary for installation of work.
- B. In determining the length of open trench or spaces for equipment, materials, supplies, and other necessities: The Contractor will consider the nature of the lands or streets where work is being done, types and methods of construction and equipment being used, inconvenience to the public or to private parties, and possible dangers and other proper matters. All work must be constructed with a minimum of inconvenience and danger to the public and all other parties concerned.
- C. Whenever any trench obstructs pedestrian and vehicular traffic in or to any public street, private driveway or property entrance, or on private driveway or property entrance, or on private property, the Contractor shall take such means as may be necessary to maintain pedestrian and vehicular traffic and access. Until such time as the work may have attained sufficient strength to support backfill, or if for any other reason it is not expedient to backfill the trench immediately, the Contractor shall construct and maintain suitable plank crossings and bridges to carry essential traffic in or to the street, driveway, or property in question as specified or directed.
- D. Contractor shall furnish and maintain all suitable signs, lights, and such required items to direct traffic.
- E. The Contractor must keep streets and premises free from unnecessary obstructions, debris and all other materials. The Owner's Representative may, at any time, order all equipment, materials, surplus from excavations, debris and all other materials lying outside that length of working space promptly removed. Should the Contractor fail to remove such material within twenty four (24) hours after notice to remove the same, the Owner's Representative may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense and may deduct the cost thereof from payment which may be or may become due to the Contractor

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Section 01500

under the Contract. In special cases, where public safety urgently demands it, the Owner's Representative may cause such materials to be removed without prior notice.

3.03 – Interference with Existing Structures:

- A. Whenever it may be necessary to cross or interfere with existing culverts, drains, water pipes or fixtures, guardrails, fences or other such structures needing special care, due notice shall be given by the Contractor to the Owner's Representative and to the various public and private agencies or individuals responsible for the utility or structure that is interfered with.
- B. Whenever required, all objects shall be strengthened by the Contractor to meet any additional stress that the work herein specified may impose upon it. Any damage caused shall be thoroughly repaired by the Contractor at their own expense. The entire work shall be the responsibility of the Contractor. All damaged items of work or items required to be removed and replaced or repaired by the Contractor to the complete satisfaction of the property Owners and/or the Owner's Representative, shall be repaired or replaced at no additional expense to the Owner.

3.04 – Removal of Water and Protection from Flooding:

- A. The Contractor shall construct and maintain, at no additional expense to the Owner, all pumps, drains, well-points or any other facility for the control and collection of groundwater and/or surface water and provide all pumps and piping for the removal of water from the trenches and excavations so that all trenches and excavations may be kept at all times free from water and so that all construction work may be performed in dry conditions.
- B. Any damage resulting from the failure of the dewatering operations of the Contractor and any damage resulting from the failure of the Contractor to maintain the areas of all work in a suitable dry condition shall be repaired by the Contractor as directed by the Owner's Representative at no additional expense to the Owner.
- C. The Contractor's pumping and dewatering operations shall be carried out in such a manner as to prevent damage to existing structures and utilities and the contract work and so that no loss of ground will result from these operations. Precautions shall be taken by the Contractor to protect new and existing work and/or to maintain satisfactory progress.
- D. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected by the Contractor.

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

Section 01500

- E. Water from the trenches, excavations, and drainage operations shall be disposed of by the Contractor in such a manner as will neither cause public nuisance nor cause injury to public health nor to public or private property nor to the work completed nor to work in progress. No extra payment will be made for the removal of water, protection from flooding, drainage work, diversion of existing water courses and such other work, but compensation therefore shall be considered as having been included in the prices stipulated for the appropriate items of work as listed in the Base Bid.

3.05 – Removal of Construction Facilities and Temporary Controls:

- A. Contractor shall completely remove temporary materials and equipment when their use is no longer required.
- B. Upon completion of work of all trades and before final acceptance of entire project, each trade shall remove, at own expense, all wiring, appurtenances, and accessories used in performance of its respective work.
- C. Temporary sheds, utilities, barricades, signs and other appurtenances related to execution of the work, and not incorporated in the permanent construction, shall be completely removed by the Contractor from the site prior to acceptance of work by Owner.
- D. Contractor shall clean and repair any and all damage caused by temporary installations or use of temporary facilities.

End of Section

MATERIAL AND EQUIPMENT

Section 01600

Part 1 – General:

1.01 – Requirements Included:

- A. Material and Equipment Incorporated Into the Work:
 - 1. Shall conform to applicable Specifications and Standards.
 - 2. Shall comply with size, make, type and quality specified or as specifically reviewed by the Owner’s Representative.
- B. Manufactured and Fabricated Products:
 - 1. Products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices and Industry Standards.
 - 2. Like parts of duplicate units shall be manufactured to standard sizes and gages, to be interchangeable.
 - 3. Two (2) or more items of the same kind shall be identical and manufactured by the same manufacturer.
 - 4. Products shall be suitable for service conditions.
- C. Equipment capacities, sizes, and dimensions shown or specified shall be adhered to unless variations are specifically reviewed and approved by Owner’s Representative.
- D. Contractor shall not use material or equipment for any purpose other than that for which it is designed or is specified.

1.02 – Manufacturer's Instructions:

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including two (2) copies to Owner’s Representative.
- B. Contractor shall maintain one (1) set of complete instructions at the job site during installation and until completion. Copies of all instructions shall be included in final Contract Record Documents, as assembled by the Contractor.

MATERIAL AND EQUIPMENT

Section 01600

- C. Contractor shall handle, install, connect, clean, prepare, acclimatize, and adjust products in strict accord with such instructions and in conformity with specified requirements.
- D. Should job conditions or specified requirements conflict with manufacturer's instructions, Contractor shall consult with Owner's Representative for further instructions.
- E. Contractor shall not proceed with work without clear instructions.
- F. Contractor shall perform work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.03 – Transportation and Handling:

- A. Contractor must arrange deliveries of products in accordance with construction schedules, and coordinate appropriately so as to avoid conflict with work and conditions at the site and when two (2) or more trades, Contractors or suppliers are involved.
- B. All materials and equipment shall be transported on legally approved conveyances as required or recommended by the respective manufacturer or supplier.
- C. All products shall be delivered in undamaged condition, in manufacturer's original containers or packaging, and with identifying labels intact and legible.
- D. Contractor shall receive and handle all materials and equipment, at the project site, by conveyances or methods as recommended by the respective manufacturer or supplier to prevent damage to products.
- E. Immediately on delivery, Contractor shall inspect shipments to assure compliance with requirements of Contract Documents and reviewed submittals, and that products are properly protected and undamaged.
- F. Contractor shall remove from the site any material or item of equipment damaged during the transportation or handling process and immediately replace at no additional cost to the Owner.

MATERIAL AND EQUIPMENT

Section 01600

1.04 – Storage and Protection:

- A. Products shall be stored in accordance with manufacturer's instructions with seals and labels intact and legible.
- B. Contractor shall store products subject to damage by the elements in weather tight enclosures.
- C. Contractor shall take appropriate measures to maintain temperature and humidity of materials within the ranges required by manufacturer's instructions.
- D. Contractor shall maintain all storage areas in a clean and orderly condition at all times.

1.05 – Exterior Storage:

- A. Contractor shall store fabricated products above the ground, on blocking and skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.
- B. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. Contractor shall arrange storage in a manner to provide easy access for inspection. Contractor shall make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.
- D. Contractor must immediately replace any material or item of equipment damaged due to inadequate storage protection at no additional cost to the Owner.

1.06 – Protection after Installation:

- A. Contractor shall provide substantial coverings as necessary to protect installed products from damage from traffic and subsequent construction operations. Remove Protections only when they are no longer needed.

MATERIAL AND EQUIPMENT

Section 01600

1.07 – Certificates of Conformance and Manufacture:

- A. In addition to other requirements specified therein, the Contractor shall furnish to the Owner's Representative, in the manner as directed, three (3) signed certificates of conformance and manufacture that all materials and/or equipment to be furnished under this Contract meets the Specification Requirements. When directed, each shipment of material shall be accompanied by the manufacturer's signed certificates of conformance and manufacture. Unless otherwise specified, all testing of materials shall be provided by the Contractor at no additional expense to the Owner.

- B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer will be the material incorporated in the work.

End of Section

SUBSTITUTIONS

Section 01631

Part 1 – General:

1.01 – Related Documents:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 – Summary:

- A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 01340 “Shop Drawings, Product Data and Samples”
 - 2. Section 01600 “Materials and Equipment”

1.03 – Definitions:

- A. Definitions in this Article do not change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents that are proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Substitutions requested during the proposal period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to the Contract Documents requested by the Owner or Owner’s Representative.
 - 3. Specified options of products and construction methods included in the Contract Documents.
 - 4. The Contractor’s determination of and compliance with governing regulations and orders issued by governing authorities.

SUBSTITUTIONS

Section 01631

1.04 – Submittals:

- A. Substitution Request Submittal: The Owner’s Representative will consider requests for substitution if received within 14 days after commencement of the Work. Requests received more than 14 days after commencement of the Work may be considered or rejected at the discretion of the Owner’s Representative.
1. Contractor shall submit copies of each request for substitution for consideration to the Owner’s Representative. Submit requests in the form and according to procedures required for change-order proposals.
 2. Contractor shall identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers for reference.
 3. Contractor shall provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
 - b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
 - c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
 - d. Samples, where applicable or requested.
 - e. A statement indicating the substitution’s effect on the Contractor’s Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. The Contractor’s certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.

SUBSTITUTIONS

Section 01631

responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Owner's Representative for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.

7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.
- B. Where a proposed substitution involves more than one prime contractor, each contractor shall cooperate with the other contractors involved to coordinate the Work, provide uniformity and consistency, and assure compatibility of products.
- C. The Contractor's submittal and the Owner's Representative's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

Part 3 – Execution (Not Applicable)

End of Section

CONTRACT CLOSE-OUT

Section 01700

Part 1 – General:

1.01 – Requirements Included:

- A. Comply with requirements stated in conditions of the Contract and in Specifications for administrative procedure in closing out the work.

1.02 – Substantial Completion:

- A. Substantial Completion: As defined by the AIA, and defined herein in accordance with these Specifications, “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 use the Work or a portion thereof for its intended use.
- B. When Contractor considers the work is substantially complete, he or she shall submit to Owner’s Representative for review:
 - 1. A written notice that the work or designated portion thereof is “Substantially Complete”.
 - 2. A list of items to be completed or corrected prior to achievement of Final Completion (to be referred to as “Punch List”).
- C. Within a reasonable time after receipt of such notice, Owner’s Representative will review the work to determine the status of completion.
- D. Should Owner’s Representative determine that the work is *not* “Substantially Complete”:
 - 1. Owner’s Representative will promptly notify the Contractor in writing, giving the reasons therefore.
 - 2. Contractor shall remedy the deficiencies in the work and send a second written notice of substantial completion to the Owner’s Representative.
 - 3. Owner’s Representative will again review the work.
- E. When Owner’s Representative concurs that the work is substantially complete, he will:

CONTRACT CLOSE-OUT

Section 01700

1. Prepare a Certificate of Substantial Completion accompanied by Contractor's list of items to be completed or corrected (Punch List), as verified and amended by the Owner's Representative.
2. Submit the Certificate to Owner, Contractor, and Manufacturer (as may be appropriate) for their written acceptance of the responsibilities assigned to them in the Certificate.

1.03 – Final Review:

- A. When Contractor considers the work is complete, he shall submit written certification that:
 1. Contract Documents have been reviewed.
 2. Work has been inspected for compliance with Contract Documents.
 3. Work has been completed in accordance with Contract Documents, including completion of all Punch List Items.
 4. Equipment and systems have been tested in the presence of the Owner's Representatives and are operational.
 5. All Work is complete and ready for final review.
- B. Owner's Representative will make final review to verify that status of completion with reasonable promptness after receipt of such certification.
- C. Should Owner's Representative consider that the work is incomplete or defective:
 1. Owner's Representative will promptly notify the Contractor in writing, listing the incomplete or defective work.
 2. Contractor shall take immediate steps to remedy the stated deficiencies, and send a second written certification to Owner's Representative that the work is complete.
 3. Owner's Representative will again review the work.
- D. When the Owner's Representative finds that the work is acceptable under the Contract Documents and that all Punch List Items have been accomplished to the

CONTRACT CLOSE-OUT

Section 01700

Owner's Representative's satisfaction, he or she shall request the Contractor to make close-out submittals.

1.04 – Fees for Additional Reviews:

- A. Should Owner's Representative perform additional reviews due to failure of the work to comply with the claims of status of completion made by the Contractor:
 - 1. Owner will compensate Owner's Representative for such additional services.
 - 2. Owner will deduct the amount of such compensation from the final payment to the Contractor.

1.05 – Contractor's Close-Out Submittal to Owner's Representative:

- A. Operation, Instruction, and Maintenance Manual: Contractor shall provide bound copies of the Operation, Instruction, and Maintenance Manual, in accordance with Section 01340 of these Specifications.
- B. Operating and Maintenance Data:
 - 1. Contractor shall instruct the Owner's Personnel with regard to equipment, systems and operating specialties which are installed as part of this project.
 - 2. Contractor shall submit brochures indicating operating instructions and maintenance schedules for all equipment, systems, operating devices and specialties.
 - 3. Contractor shall submit detailed maintenance methods and schedules for all materials and equipment provided in this project.
- C. Warranties, Guarantees and Bonds: In addition to the Warranty and Guarantee Requirements of the General Conditions, provide all other guarantees, bonds, affidavits, and certifications required throughout the Specifications.
- D. Contractor shall provide all spare parts and maintenance materials to Owner, unless otherwise specified.

1.06 – Final Adjustment of Accounts:

- A. Submit a Final Statement of Accounting to Owner's Representative.

CONTRACT CLOSE-OUT
Section 01700

1. Statement shall reflect all adjustments to the Contract Sum, including:
 - a. The original Contract Sum.
 - b. Additions and deductions resulting from:
 - i. Previous Change Orders.
 - ii. Allowances
 - iii. Unit Prices
 - iv. Deductions for non-corrected work
 - v. Penalties and Bonuses
 - vi. Deductions for Liquidated Damages
 - vii. Deductions for Re-inspection Payments
 - viii. Other adjustments
 2. Total Contract Sum, as adjusted.
 3. Previous Payments
 4. Sum Remaining Due
- B. Owner's Representative will prepare a Final Change Order reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.07 – Final Application for Payment:

- A. Contractor shall submit the Final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

End of Section

CONTRACT RECORD DOCUMENTS

Section 01720

Part 1 – General:

1.01 – Requirements Included:

- A. Maintain at the site for the Owner one (1) record copy of:
 - 1. Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change Orders and other Modifications to the Contract
 - 5. Owner’s Representative Field Orders or Written Instructions
 - 6. Reviewed Shop Drawings, Product Data and Samples
 - 7. Field Test Records
 - 8. Copies of All Environmental Permitting Documents in accordance with Section 01060 of these Specifications.

- B. The Contractor will be required to furnish at no additional expense to the Owner, the services of a Surveyor and/or Engineer registered in the State where the project is located and under whose direction shall be obtained and recorded all surveys, measurements, and such other data required for the determination of the as-built records of the construction of all site work (see Section 01050 of these Specifications).

1.02 – Maintenance of Documents and Samples:

- A. Maintain all documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

1.03 – Marking Devices:

- A. Provide felt tip marking pens for recording information in the color code designated by Owner’s Representative.

1.04 – Recording:

- A. Label each document "Contract Record" or "Project Record" in neat large printed letters (for the purposes of these Specifications, the terms "Contract Record" and "Project Record" shall be interchangeable. Both shall require full adherence to these Contract Documents and will serve to be the record documents of the project.

- B. Record information concurrently with construction progress.

- C. Do not conceal any work until required information is recorded.

CONTRACT RECORD DOCUMENTS

Section 01720

- D. As-Built Drawings: Principal dimensions, elevations and other data, as required, shall be recorded for all work, such as:
1. Significant deviation of any nature made during construction.
 2. Location of underground mechanical and electric services, pipe, valves, fittings and appurtenances, referenced to permanent surface improvements.
 3. Location of mechanical and electrical services, utilities and appurtenances that are concealed by construction, referenced to accessible features of the completed construction.
 4. Field changes of dimension and detail.
 5. Changes made by Field Order or by Change Order.
 6. Details not on original Contract Drawings.
- E. The marked-up prints shall be inspected as needed by the Owner's Representative and shall be corrected immediately if found either inaccurate or incomplete.
- F. Specifications and Addenda: Legibly mark each section to record:
1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
 2. Changes made by Field Order or by Change Order.

1.05 – As-Built Drawings:

- A. At the completion of the project, the record prints shall be submitted to the Owner's Representative for final review and comment.
- B. The Contractor shall correct, amplify and do all other work as may be required by the Owner's Representative to complete the Drawings in a manner satisfactory to the Owner's Representative.

1.06 – Submittal:

- A. At Contract Close-out, deliver record documents to Owner's Representative for the Owner.

CONTRACT RECORD DOCUMENTS
Section 01720

- B. Accompany submittal with transmittal letter in duplicate, containing:
1. Date
 2. Project Title and Number
 3. Contractor's Name and Address
 4. Title and Number of Each Record Document
 5. Signature of Contractor or his Authorized Representative

End of Section

Part 1 – General:

1.01 – Related Documents:

- A. The General Conditions, Supplementary Conditions and applicable portions of Division 1 of these Specifications are a part of this Section, which shall consist of all labor, equipment and materials necessary to complete all excavating, filling and grading work indicated on the Drawings, herein specified, or both.
- B. Applicable portions of Division 2 of these Specifications, including, but not necessarily limited to:
 - 1. Section 02100, “Site Clearing and Preparation”
 - 2. Section 02210, “Site Grading and Drainage”
 - 3. Section 02270, “Slope Protection and Erosion Control”

1.02 – Description of Work:

- A. Providing of additional material hereinafter specified or needed for fills.
- B. Backfilling of all trades.
- C. Compaction of fills of all trades as hereinafter specified.

1.03 – Protection and Precautionary Measurements:

- A. Carefully maintain benchmarks, monuments, and other reference points. If disturbed or destroyed, replace reference points as directed.
- B. Protect active pipes, if encountered, and notify persons owning same. If encountered, remove inactive utilities from within building lines. Plug or cap where indicated or directed.
- C. Protect persons and property from damage and discomfort caused by dust. Water as necessary, or apply other Dust Control techniques or products to quell dust.
- D. Protect trees and associated root zones of trees designated for protection

1.04 – Erosion Control:

- A. Employ satisfactory methods and operations to minimize erosion of soil during earthwork operations. Follow accepted standards of the RI Department of Environmental Management and as otherwise specified within these specifications for erosion control.

Part 2 – Elevation and Obstructions:

2.01 – General:

- A. The Contract is based upon the following: That the surface elevations are as indicated; that no pipes or other artificial obstructions, except those indicated, will be encountered.
- B. In case the actual conditions differ substantially from those stated, and/or shown, Notify the Owner's Representative of all deviations. Should it be determined that Contract or Project Scope require adjustment or modification, the Owner and Contractor will negotiate such amendment, and shall adjust project scope and/or contract in accordance with procedures outlined in these specifications.

2.02 – Quality Assurance:

- A. Materials, methods, and compaction tests will be subject to approval of an approved Inspection Agency specified elsewhere in these specifications.

2.03 – Code and Standards:

- A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction. The contractor is required to contact Dig-Safe 72 hours prior to start of excavation.

Part 3 – Requirements:

3.01 – Traffic:

- A. Contractor shall conduct all earthwork operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate

EARTHWORK

Section 02200

routes around closed or obstructed traffic ways if required by governing regulations.

2. Provide all traffic control required throughout and due to construction procedures, or resulting conditions, and pay all costs incurred.

3.02 – Damages:

- A. Contractor shall promptly repair damages caused by operations to adjacent facilities, or facilities within project site not specified for removal, as directed by the Owner's Representative and at no additional cost.

3.03 – Unauthorized Excavation:

- A. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Owner's Representative.
- B. If Unauthorized Excavation occurs in areas that are specified to be under footings, foundation bases, or retaining walls, Contractor shall fill unauthorized excavation by extending the indicated bottom elevation of the footing or base to the excavation bottom without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, only when acceptable to Owner's Representative.
- C. If Unauthorized Excavation occurs in areas not specified in above specification, Contractor shall backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Owner's Representative.
- D. Contractor shall complete all corrective work to Unauthorized Excavation as specified above at no expense to the Owner.

3.04 – Shoring and Bracing:

- A. Contractor shall brace and shore sides of excavation as necessary to prevent danger to persons or damage to structures, injurious caving, or erosion.
- B. Materials for shoring and bracing, such as sheet piling, uprights, stringers, and crossbraces, shall be provided by Contractor in good serviceable condition.
- C. All Shoring and bracing shall comply with Local Codes and Authorities having jurisdiction.

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- D. Contractor shall maintain shoring and bracing in excavation regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
- E. Should they occur, slides and cave-ins of excavations shall be repaired by the Contractor at their own expense.
- F. Contractor shall remove shoring and bracing before backfilling.
- G. In removing shoring and bracing, Contractor shall exercise care to prevent voids. Immediately fill voids, if formed, with approved fill material at Contractor's expense.

3.08 – Water and Frost:

- A. Contractor shall keep earth under footings and slabs dry and free from frost. Should bearing surfaces be softened by water or frost, re-excavate to solid bearing and fill with concrete or gravel as directed by the Owner's Representative, and at no expense to Owner.

Part 4 – Filling:

4.01 – General:

- A. Contractor shall remove debris and organic matter before filling.
- B. Only approved materials shall be used by Contractor for fills.
- C. Unless otherwise specified or requested by the Owner's Representative, Contractor shall make fills as soon as feasible thereafter to insure maximum settlement and to avoid disturbance to the subgrade.
- D. Contractor shall not place fill on frozen ground.
- E. All material provided by Contractor shall be free from frost, roots and other vegetable matter, large rocks, rubbish, brick, and other undesirable material.
- F. Install fills in indicated thicknesses, compacted in lifts as specified herein.
- G. Fills executed by Contractor shall have neat, uniform side slopes, smoothed and graded to those excavations not required to be filled.

4.02 – Fill Materials:

- A. "Processed Gravel" shall be free from loam and other specified undesirable materials, conforming to the requirements of Table I, Column I, Section M.01.09 GRADATION OF AGGREGATES, RI Department of Transportation Standard Specifications for Road and Bridge Construction, as amended.

On-site material may be used under building areas only after satisfactory test data has been submitted and only with the approval of the Owner's Representative.

- B. "Bank Run Gravel" and/or "Gravel Borrow" where indicated as "gravel fill", and where else required, shall be free from loam and other specified undesirable material, and conforming to the requirements of Table I, Column I, Section M.01.09 GRADATION OF AGGREGATES, RI Department of Transportation Standard Specifications for Road and Bridge Construction, as amended.

On-site material may be used only after satisfactory test data has been submitted and only with the approval of the Owner's Representative.

- C. "Stone Fines" consisting of clean, inert, hard, durable grains of quartz or other hard durable rock; free from loam or clay, surface coatings and deleterious material; and conforming to the following analysis:

<u>Sieve Size</u>	<u>% Passing</u>
#8	100
#50	25-40
#100	0-10
#200	0-5

- D. "Washed Crushed Stone" consisting of clean, inert, hard, durable grains of quartz or other hard durable rock; free from loam or clay, surface coatings and deleterious material; and having an aggregate size no greater than 3/4" and no less than 1/2".

- E. "Bedding", unless otherwise specified by the Owner's Representative, shall be as defined by ASTM D2321, Class I, II, or III and installed as required in ASTM D2321.

Part 5 – Compaction:

5.01 – General:

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- A. Contractor shall place fill in horizontal layers, beginning with the lowest areas and building up until the entire area to be filled is at a uniform elevation.
 - 1. Compact each layer with an approved vibratory device to achieve minimum density requirements prior to placement of successive layer.
 - 2. Continue compaction of each layer until there is no evidence of weaving or creeping. Compact places inaccessible to large equipment with approved mechanical tampers, as well as around the perimeter of foundations, walls and around column pedestals and footings.
 - 3. Earth in cut sections for paved areas shall be excavated to subgrade. The resulting surface of the cut shall be compacted as required, to not less than ninety five percent (95%) of maximum density.
- B. Subgrade or Fill Material: Unless otherwise specified, Contractor shall compact to ninety percent (95%) of maximum density in a maximum depth of twelve (12) inch loose layers, except for two (2) layers a maximum depth of six (6) inch loose layers directly over pipes.
- C. Compacted Gravel Base Material: Unless otherwise specified, Contractor shall compact to ninety percent (95%) of maximum density in three (3) inch loose layers.
- D. Attention is directed to the grain size characteristics of the material and necessity for the difficulty of controlling and maintaining optimum moisture content during compaction. Material in each layer shall contain optimum moisture for maximum density compaction and the optimum moisture content shall be uniformly distributed throughout the layer. Harrowing or other working of the material may be required to produce uniformity and control of the water content.
- E. Contractor shall slope the surface of each layer a minimum of one percent (1%) plus or minus, at the conclusion of each day's work to provide surface drainage.
- F. Whenever in-place densities are below minimum acceptable limits, as determined by AASHTO T-191 or AASHTO T-205, additional compaction will be required of the Contractor to produce the specified densities, without additional cost to the Owner. When greater densities than the minimum specified are required by the Owner's Representative, the work will be subject to Contract Unit Prices.
- G. When requested by the Owner's Representative, the Owner will retain a laboratory approved by the Owner's Representative to supervise and control the construction of the fill. This laboratory shall perform tests in accordance with AASHTO T-180 on the

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materials the Contractor proposed to use to establish the compacted dry weight at optimum moisture. Results of these tests shall be submitted to the Owner's Representative for approval and work may start only after the Owner's Representative approves the test results.

- H. If required, the Owner's Representative or approved testing laboratory under the direction of the Owner's Representative shall provide continuous inspection of compacted fills.
- I. Backfilling material shall conform to laboratory requirements herein specified and shall be soil obtained from approved sources.
- J. The area to be filled shall be cleared of all loose material and inspected by Contractor to ensure area is suitable to receive fill. If area to be filled fails following filling operations, due to unsuitable nature of area to be filled, Contractor shall repair or replace fills as needed at no expense to the Owner.
- K. Fill material shall be free from frost and shall not be placed on frozen ground. Fill shall be deposited by Contractor in layers of such thickness as required by its nature or as directed, but the uncompacted thickness of each layer shall not exceed (12) inches. Each layer shall be separately compacted to a uniform solid mass by use of vibratory compactors or other approved equipment. Fill shall be placed in horizontal layers, beginning with the lowest areas and building up until the entire area to be filled is at a uniform elevation. The Contractor shall control the moisture content of the fill material, as directed by the laboratory to insure maximum density by either the addition of water, or by harrowing and working prior to compacting. Each layer shall be free of ruts and shall meet compaction requirements before a succeeding layer is placed. Compaction of each layer shall continue until no weaving or creeping takes place.
- L. Backfill in areas excavated after construction of the fill shall be constructed in layers whose loose thickness shall not exceed six (6) inches, which shall be thoroughly compacted with approved hand equipment to the density herein before specified prior to placement of successive layers.
- M. Field tests of moisture content prior to compaction and dry weight after compaction shall be made by the contractor or approved laboratory to assure thorough and uniform compaction. Testing shall be performed on the layer immediately below the layer just compacted.

End of Section

Part 1 – General:

1.01 – Related Documents:

- A. The General Conditions, Supplementary Conditions, and applicable portions of Division 1 of the specification are part of this section which shall consist of all labor, equipment, materials and other costs necessary to complete all electrical work indicated on the drawings, herein specified or both.
- B. Lighting Specifications, as provided by Specified Lighting Manufacturer, and appended as part of the Project Manual (see attached section 26 56 68 – Exterior Athletic Lighting Specification and Central Ave Playground Engineered Design Package as prepared by Specified Lighting Manufacturer).

1.02 – Description of Work:

- A. The electrical system layouts indicated are generally diagrammatic and locations of outlets and equipment are approximate only; Contractor shall be responsible for Complete and Final Electrical Service Design in Accordance with all local, state, and federal regulations and govern exact routing of wiring and locations of outlets and equipment by structural conditions and obstructions. This is not to be construed to permit redesigning systems. Locate all equipment requiring maintenance and operation so that it will be readily accessible. The right is reserved to make any reasonable change in location of outlets and equipment prior to roughing-in without involving additional expense. This may involve slightly longer wiring runs, longer stems, additional mounting provisions, etc. Allow for this in your bid because additional compensation will not be provided. Items not specifically located on the plans shall (for the purposes of bidding) be assumed to be in the farthest, most difficult location. Exact location to be as directed by the Owner's Representative in the field. Provide all systems complete. Drawings and Specifications form complementary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation. All wiring and connections to be done with associated circuit de-energized. The word "provide" is hereby defined to mean, "furnish and install." The word "wiring" is hereby defined to mean "wire, raceway, boxes and fittings, etc." The work includes, but is not limited to the following:
 - 1. Furnish and Install new electric service, complete in place.
 - 2. Exterior electrical work - see site drawings.

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3. Power and lighting system including distribution equipment, feeders, branch circuits, wiring devices, lighting fixtures, poles, wiring, etc.
4. All incidental work as required for successful and lawful execution and installation of all electrical components, to deliver specified performance of all electrical equipment.
5. All excavation of required trenching, backfilling of trenches, and light pole foundation holes to be by others. Backfilling of all light pole foundation holes to be by contractor and completed in accordance with Manufacturer's Specifications and all local, state, and federal regulations.

1.03 – Related Work Specified Under Other Sections:

- A. Construction Facilities and Temporary Controls - see Section 01500
- B. Earthwork and Backfilling- see Section 02200

1.04 – Quality Assurance:

- A. Shop Drawings and Product Data: Submit catalog data and/or drawings of the following equipment for final approval:
 1. All lighting system components (see Lighting Specifications appended herewith)
 2. Tamper and Weather Resistant Electric Outlets
 3. Tamper and Weather Resistant Electric Outlet Covers
 4. Ground Mounted Lockable and Weather Resistant Electric Service Enclosure
- B. Where the drawings or specifications list specific brands or catalog numbers, only these products or "approved equals" may be used. If contractor proposes use of substituted "or equal" materials, they may do so only following contract award and after submission of substitution request in accordance with these specifications.
- C. It is the responsibility of the Contractor to check all dimensions and details on shop drawings, before submission to the Owner's Representative, reject same if necessary and only forward to the Owner's Representative shop drawings which he/she is reasonably certain fulfill the requirements of the contract documents and the work. The approval of shop drawings by the Owner's Representative shall be general only in character and not mean dimensions on drawings have been checked, and will in no way relieve the Contractor of the responsibility for proper counts, fitting and construction of the work, nor from the necessity of furnishing materials or doing the work required by

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- the drawings and/or specifications, which may not be indicated on the shop drawings when approved. All shop drawings shall be checked by the Contractor, and must bear the Contractor's stamp of approval. At a minimum, the contractor shall state in writing that he/she has "checked and approved shop drawings for compliance and coordination". Drawings submitted without this stamp of approval will not be considered.
- D. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Owner's Representative's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Owner's Representative in writing of such deviation, in a separate cover letter on Contractor's letterhead, at the time of submittal and the Owner's Representative has given written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Owner's Representative's approval thereof.
 - E. Tests: Test the complete installation to prove it free from shorts, grounds, opens and faulty connections. Make any corrections necessary before acceptance. Test each function of each system including each device.
 - F. Certification: Upon request, provide "Certification" (by a recognized testing agency or a Professional Engineer registered in the state that the project is located in) that submitted items of equipment are suitable for their intended use.
 - G. Record Drawings: Owner's record drawings shall be updated as the project progresses. Maintain documents in a safe, dry location. Indicate clearly and accurately any changes necessitated by field conditions and dimension all raceways built into or under concrete slabs or buried under ground.
 - H. As-Built Drawings: Contractor to prepare as-built drawings in CAD format at contractor's expense. Contract drawings in CAD format to be furnished to contractor at no cost to contractor. Contractor to provide two compact discs and two hard copies of final as-built drawings.
 - I. Operating Instructions and Manuals: Provide the Owner or his representative with complete operating instructions by qualified personnel of all electrical systems. Provide three (3) bound sets (indexed and bound in three sturdy three-ring binders) of operating and maintenance instructions of all electrical systems employed and all shop drawings.
 - J. Manuals: Provide one (1) extra bound set of all shop drawings. Bind in a sturdy 3-ring binder.

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- K. Letter of Confirmation: Include in the above manuals a letter confirming that the following items have been completed:
1. Keys have been provided for all locked electrical equipment.
 2. The provisions of the "Operating Instructions and Manuals" paragraph of these specifications have been met.
 3. Spare fuses have been provided.
 4. Identification is complete and in accordance with these specifications.
 5. As-built electrical drawings have been completed and submitted.
 6. All tests are complete and in accordance with these specifications.
 7. All required shop drawings have been submitted and approved.
 8. The entire installation has been accepted by all authorities.

1.05 – Permits and Fees:

- A. Obtain all permits for the work of this section.
- B. Pay all fees, as applicable.

1.06 – Codes and Standards:

- A. Do all wiring and provide all equipment in accordance with the prevailing issue of the National Electrical Code, State Building Code, State Fire Safety Code and any additional local rules in force by local inspection authorities. Obtain and pay for all necessary permits, certificates, etc., as required. Present satisfactory proof of final inspection and approval by all inspection authorities.
- B. Consider the following Industry Standards as minimum requirements for all materials, equipment and systems where such standards are established for materials in question:
 1. National Electrical Manufacturers Association
 2. National Fire Protection Association
 3. Institute of Electrical and Electronic Engineers

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4. A nationally recognized testing laboratory (UL, ETL, etc.)
5. Factory Mutual
- C. All equipment must bear the label of a nationally recognized testing laboratory, acceptable to the Owner's Representative and the authority having jurisdiction.

1.07 – Electrical Installation Standards:

- A. Where applicable, this installation shall comply with the following NECA (National Electrical Contractors Association) "National Electrical Installation Standards." Except, if there is a conflict between this specification and these standards, the requirements of this specification shall prevail.

NECA 1-2000	Standard Practices for Good Workmanship in Electrical Contracting
NECA/AA 104-2000	Recommended Practice for Installing Aluminum Building Wire and Cable
NECA/IESNA 501-2000	Recommended Practice for Installing Exterior Lighting Systems

1.08 – Identification:

- A. Provide typewritten directories, not smaller than 5" x 7", mounted under clear plastic affixed to the inside surface of all door-in-trim panels. Information shall include circuit numbers, type of load served and location of load served. For example: "#1 Receptacles in Pavilion".
- B. Label the exterior of distribution panels, power and lighting panels, cabinets, each switch of fuse switch panels, each disconnect switch (including those furnished under other sections), etc., as follows: Provide lightweight laminated phenolic material of three layer type with white centerpiece 1/16" thick. Engrave letters not smaller than 1/8" high through the black top of the white centerpiece. Securely fasten by means of screws or rivets to the exterior of the equipment so marked. (Glue is not acceptable.) Provide name of equipment (and use where appropriate). Also, identify each circuit, if a directory is not included. For example: Panel A "Lighting and Power."
- C. Identification shall include existing panels and equipment modified under this contract and additional existing items, as indicated.

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- D. At each pull box, junction box and outlet box, each circuit contained therein shall be identified by panel designation and circuit number. This shall be accomplished by attaching hand written cardboard labels with string to each set of wires or by other agreed upon methods. In addition, where boxes are concealed, covers shall be marked with the same information using magic marker or other agreed upon means.

1.09 – Cleaning, Painting and Refinishing:

- A. Paint all new plywood backboards on all sides and edges before mounting, in accordance with all applicable local, state, and federal regulations.
- B. Thoroughly clean all new electrical equipment, devices and enclosures upon completion of all work.
- C. Refinish any new electrical equipment whose finish is damaged or rusted as determined by the Owner's Representative.

1.10 – Scheduling and Shutdowns:

- A. All work must be scheduled to allow the least interference with the normal operation of the existing facility. Schedule must be arranged to meet the approval of the Owner. All shutdowns of services (power, fire alarm, telephone, etc.) must be approved in writing by the Owner.
- B. All existing surrounding services (power, fire alarm, telephone, lighting, emergency lighting, exit signs, etc.) must remain in operation during full period of construction. Provide temporary or permanent wiring (if required) to accomplish this.
- C. Make any necessary re-circuiting, extensions of existing circuits and relocations required to properly re-energize remaining existing devices or equipment that may be interfered with by new construction or removals.

1.11 – Inspections/Site Observations:

- A. The authority having jurisdiction (usually the Local Electrical Inspector) shall be notified at periodic intervals that an inspection is requested. Inspections shall be requested at points of progress, meeting the approval of the inspector and as a minimum (but is not limited to) include the following:
 - 1. Prior to backfilling trench.
 - 2. Prior to installation of panel panel trims/covers.
 - 3. For observation of connections and grounding at transformers.

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- B. Do not cover the work before the Inspector has had a chance to observe it in completed form.
- C. The electrical foreman shall request a meeting with the Owner's Representative within 7 days after the notice to proceed to assure that there is agreement on the scope of work and to answer questions.
- D. The electrical foreman shall provide assistance to the Owner's Representative during site observations:
 - 1. Describe the progress of the electrical work in detail.
 - 2. Accompany the Owner's Representative on his tour of the site, upon request.
 - 3. Provide use of a suitable ladder, scaffolding or bucket truck to observe the work, upon request.
 - 4. Upon request, remove panel trims, junction box covers, etc. for observation of the work.
 - 5. Provide use of project drawings, specifications and shop drawings.

Part 2 – System Description:

2.01 – Materials - General:

- A. All materials and equipment to be new unless specifically stated otherwise and meet NEMA Standards for outdoor use, as required.
- B. Materials and equipment shall be suitable for their intended use and for the environment in which they are installed. Equipment located outside shall be weatherproof and constructed of materials that will not rust. This includes brackets, screws, etc.
- C. The contractor is responsible for coordinating all dimensions to make sure that boxes, raceways, equipment, fixtures, etc., fit properly in the finished construction. If special provisions, such as shallow boxes, are required, they shall be provided at no increase in contract price, regardless of catalog numbers listed in contract documents or on shop drawings.
- D. All fittings and accessory equipment required for proper operation of the various electrical systems specified will be supplied by the contractor without extra compensation. Provide all fittings, terminations, relays, components of panels and equipment, etc., needed for the best performance possible at the present state-of-the-art.

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2.02 – Electric Service:

- A. Furnish and Install new electric service, complete in place, from Existing Utility Pole along McCausland Avenue, or as required by National Grid, to existing pavilion and new light poles, consisting of underground cable service.
- B. Furnish and Install all necessary and incidental electrical components needed for the complete electrical service, including but not limited to new panels, control boxes, meter, transformers, wiring, conduit, etc.
- C. Furnish and Install new lockable waterproof ground mounted enclosure in accordance with National Grid and NEMA Standards. Provide product data submittal and specifications for review by owner's representative prior to installation. Enclosure shall be constructed of durable wear and rot resistant metal materials and sized as appropriate to house all necessary electrical components. It shall meet all requirements of local, state, and federal regulations. Provide appropriate Concrete Pad for secure mounting of enclosure in accordance with manufacturer's installation specifications.
- D. Furnish and Install new electrical outlets, wiring, and Lighting Components (see Lighting Specifications)
- E. Handholes, where specified, shall be in accordance with RIDOT Standard 18.2.0.

2.03 – Electric Distribution System:

- A. Distribution system will consist of wire feeders from the meter to panelboard located as directed.
- B. System and equipment grounding will strictly comply with the requirements of the National Electrical Code and local code.

2.04 – Wiring Methods:

- A. In accordance with National Grid and Local Code requirements for exterior and below grade wiring.

2.05 – Wiring Devices and Plates:

- A. All wiring devices shall be by one manufacturer.
- B. Configuration of all receptacle devices shall conform to NEMA Standards.

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- C. All wiring device plates shall be specification grade anodized aluminum with black finish.
- D. All switches and receptacles shall be tamper and weather resistant rated 20 amperes, or as required by lighting manufacturer, where applicable, and certified for outdoor use. Receptacles shall be housed in lockable, solid, weatherproof covers. Provide product data submittal and specifications for review by owner's representative prior to installation. Switches and receptacles shall be located as directed by Owner's Representative.

End of Section

SECTION 26 56 68 – EXTERIOR ATHLETIC LIGHTING

PART 1 – Sports Lighting

1.1 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of this alternate is to define the performance and design standards for the project using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.
- C. The sports lighting will be for the following fields:
 - 1. Basketball 1 & 2
 - 2. Skate (Action Sports) Park
 - 3. Security Zones
- D. The primary goals of this sports lighting project are:
 - 1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed for a period of 10 years.
 - 2. Environmental Light Control: It is the primary goal of this project to minimize spill light and glare in the adjacent neighborhoods.
 - 3. Life-cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated, and the field(s) should be proactively monitored to detect luminaire outages over a 10-year life cycle. To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system.
 - 4. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Field(s) should be proactively monitored to detect luminaire outages over a year life cycle.

1.2 LIGHTING PERFORMANCE

- A. Illumination Levels and Design Factors: The illumination target levels specified shall be based on guaranteeing light levels for 10 years or 10,000 hours, whichever comes first. Light levels shall not drop below specified targeted lighting levels during the 10,000 operating hours. Appropriate light loss factors shall be applied and submitted for the basis of design.
- B. Horizontal illumination levels shall be based at any point on a parallel plane 36 inches above the playing surface, unless otherwise indicated. Lighting calculations shall be placed on a grid as shown in the specification. Light level requirements will be as follows:

Area of Lighting	Average Maintained Light Levels	Maximum to minimum Uniformity Levels	Grid Points	Grid Spacing
Basketball 1 & 2	20 Footcandles	2:0:1.0	40	10' x 10'
Skate Park	15 Footcandles	5.0:1.0	77	10' x 10'
Security Zone 1	5 footcandles	N/A	329	10' x 10'
Security Zone 2	5 footcandles	N/A	84	10' x 10'
Corner Grid	5 footcandles	N/A	66	10' x 10'

- 1. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, the pole mounting heights from the ground plain shall be 50'.

1.3 ENVIRONMENTAL LIGHT CONTROL

- A. Spill and Glare Control: Fixtures shall have external visors to control spill light and reduce glare. Minimum mounting heights for fixtures shall be 50' & 60' above playing field.

- B. Maximum vertical spill light values shall not exceed .5 footcandles at a distance 100 feet from the sideline of the Use Areas.

Footcandle readings shall be taken at 30-foot intervals along the perimeter spill line running the length of the site. Meter shall be oriented with the photocell pointed at the brightest source of light coming from the luminaires.

- D. The first page of a photometric report showing horizontal and vertical axial candle power shall be provided for each type of luminaire. This data must come from a NVLAP certified lab.

1.4 LIFE-CYCLE COSTS

- A. Energy Consumption: The kW consumption for the field lighting system shall be 10 or less.
- B. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 10 years from the date of equipment shipment. Individual lamp outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.
- C. Remote Monitoring System: System shall monitor lighting performance, including on/off status, hours of usage and lamp outages. If luminaire outages that affect playability are detected, manufacturer shall contact owner so that maintenance can be proactively scheduled. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed).
- D. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields, to only having permission to execute "early off" commands by phone.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- E. Management Tools: Manufacturer shall provide a web-based database of actual field usage and provide reports by facility and user group.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

1. Cumulative hours: shall be tracked to show the total hours used by the facility
2. Current lamp hours: shall be tracked separately to reflect the amount of hours on the current set of lamps being used, so relamping can be scheduled accurately

- F. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring systems for a period of 10 years.

1.3 WARRANTY AND GUARANTEE

10-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 10 years from the date of shipment or 10,000 hours, whichever comes first. Warranty shall guarantee specified light levels; system energy consumption; monitoring, maintenance and control services, spill light control, and structural integrity. Manufacturer shall maintain specifically funded financial reserves to assure fulfillment of the warranty for the full term. Warranty may exclude fuses, storm damage, vandalism, abuse and unauthorized repairs or alterations.

1.4 DELIVERY TIMING

Equipment On-Site: The equipment must be on-site 6-8 weeks from receipt of approved submittals and receipt of complete order information. Foundations for light poles shall be on site within 2-3 weeks from receipt of approved submittals and receipt of complete order information.

1.5 PRE-BID SUBMITTAL REQUIREMENTS

- A. Approved Product: Musco's Lighting® LED sports lighting system is the approved base bid product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.
- B. Design Approval: The owner / engineer will review pre-bid shop drawings from the manufacturers to ensure compliance to the specification. If the design meets the design requirements of the specifications, a letter will be issued to the manufacturer indicating approval for the specific design submitted.
- C. Manufacturer Provided engineered foundation embedment design by a registered engineer in the State of Rhode Island;
- D. Full Site Photometric design (Blanket Grid) and Final Foundation and Pole Assembly Drawing/Tables based on Contract Drawings to ensure minimum average maintained light levels listed in Part 1.2 of these specifications.
- E. Final Electric Service Design to be by Contractor. Contractor shall coordinate with National Grid as necessary. Following electric service design by contractor provide electric control summary for lighting system.

PART 2 – PRODUCT

2.1 LIGHTING SYSTEM CONSTRUCTION

- A. System Description: Lighting system shall consist of the following:
 - 1. Galvanized steel poles and crossarm assembly
 - 2. Pre-stressed concrete base embedded in concrete backfill allowed to cure for 24 hours before pole stress is applied. Alternate may be an anchor bolt foundation designed such that the steel pole and any exposed steel portion of the foundation is located a minimum of 18 inches above final grade. The concrete for anchor bolt foundations shall be allowed to cure for a minimum of 28 days before the pole stress is applied, unless structural engineer of record allows shorter cure time.
 - 3. LED Lamp Technology Sports Lighting Fixtures. Minimum of 10,000-hour life where required light levels do not fall below target maintained illuminance levels, instant on/off capabilities.
 - 4. Fixtures must include thermal management and come with a 10-year full coverage warranty including parts and labor.
 - 5. Minimum of 5,700 Color Temp and 65+ CRI.
 - 6. Fixture Operating Temperature Range of -30 Degrees C to 55 Degrees C. Maximum Junction Temperature for the diodes of 80 degrees C.
 - 7. Electronic Driver with an efficiency of 95% or greater. Maximum starting inrush of 7 amps at 25 degrees C.
 - 8. Secondary Wiring: Manufacturer shall supply all necessary wiring to connect the fixture to the driver enclosure. Wiring shall be protected with either a jacketed cord or conduit.
 - 10. Remote electrical enclosure at the base of the pole (approximately 10' above grade) for all drivers and associated electrical components.
 - 11. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, ballast and other enclosures shall be factory assembled aimed, wired and tested.
 - 12. Durability: The lighting system, including all mounting brackets, shall be powder coat painted for protection. All mounting brackets are to be made of steel construction. Only stainless steel or zinc plated steel hardware is allowed.

13. Safety: All system components shall be UL Listed for the appropriate application.
- B. Electric Power Requirements for the Sports Lighting Equipment.
 1. Electric Power: see attached engineered design prepared by Lighting Manufacturer.
 2. Maximum total voltage drop: Voltage drop to the remote enclosure shall not exceed three (3) percent of the rated voltage.
- C. Lightning Protection: Manufacturer shall provide integrated lightning grounding via concrete encased electrode grounding system as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.

2.2 STRUCTURAL PARAMETERS

- A. Wind Loads: Wind loads shall be based on the 2012 International Building Code. Wind loads to be calculated using ASCE 7-05, a design wind speed of 140 mph, exposure category C and wind importance factor of 1.
- B. Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2009 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-5).
- C. Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report.

PART 3 – EXECUTION

3.1 SOIL QUALITY CONTROL

- A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated.

3.2 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- B. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles, uniformity ratios, and maximum kilowatt consumptions are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be liable to any or all of the following:
 1. Manufacturer shall at his expense provide and install any necessary additional luminaires to meet the minimum lighting standards. The Manufacturer shall also either replace the existing poles to meet the new wind load (EPA) requirements or verify by certification by a licensed structural engineer that the existing poles will withstand the additional wind load.
 2. Manufacturer shall minimize the Owner's additional long-term luminaire maintenance and energy consumption costs created by the additional luminaires by reimbursing the Owner the amount of \$1,000.00 (one thousand dollars) for each additional luminaire required.
 3. Manufacturer shall remove the entire unacceptable lighting system and install a new lighting system to meet the specifications.

**REQUIRED SUBMITTAL INFORMATION FOR ALTERNATE SYSTEM
Design Submittal Data Checklist and Certification for Alternate System Bids**

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements

Tab	Item	Description
A	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
B	Equipment Layout	Drawing(s) showing field layouts with pole locations.
C	On Field Lighting Design	Lighting design drawing(s) showing: a. Field Name, date, file number, prepared by, and other pertinent data. b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified. c. Pole height, # of luminaires per pole, as well as luminaire information including wattage, lumens and optics. d. Height of light test meter above field surface. e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in footcandles (fc); uniformity including maximum to minimum ratio, coefficient of variance and uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor. f. Alternate manufacturers shall provide light scans meeting target illumination levels in section 1.2.
E	Life-cycle Cost Calculation	Document life-cycle cost calculations as defined in the specification. Identify energy costs for operating the luminaires, maintenance cost for the system including spot lamp replacement. All costs should be based on 10 Years.
F	Photometric Report	Provide photometric report for a typical luminaire used showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.
G	Aiming Summary	Document showing each luminaire's aiming angle and the poles on which the luminaries are mounted. Each aiming point shall identify the type of luminaire.
H	Aiming Report	Provide test report showing aiming alignment can be maintained to 150 mph winds.
I	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of Rhode Island.
J	Control & Monitoring System	Manufacturer shall provide written definition and schematics for automated control system to include monitoring. They will also provide examples of system reporting and access for numbers for personal contact to operate the system.
K	Electrical Distribution Plans	If bidding an alternate system, manufacturer must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of Rhode Island.
L	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed per specification for 10 years.
M	Warranty	Provide written warranty information including all terms and conditions.
N	Project References	Manufacturer to provide a list of projects where the technology proposed for this project has been installed in the state of Rhode Island. If any form of a constant light system is bid, a minimum of 5 project references completed within the last calendar year is required. For a depreciating light system a full list of projects completed within the past 3 years is required. Reference list will include project name, project city, and if requested, contact name and contact phone number.
O	Product Information	Complete set of product brochures for all components, including a complete parts list and UL Listings.
P	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
Q	Non-Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.

The information supplied herein shall be used for the purpose of complying with the specifications for Central Ave Playground in East Providence, Rhode Island. By signing below I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer: _____

Signature: _____

Contact Name: _____

Date: ____/____/____

Central Ave Playground Basketball

East Providence, RI

Lighting System

Pole / Fixture Summary					
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Group
B1	50'	50'	5	96 LED	A
B2	50'	50'	4	96 LED	A
			3	96 LED	B
B3	50'	49'	3	96 LED	B
P1	60'	60'	6	96 LED	C
P2	50'	50'	2	96 LED	C
5			23		

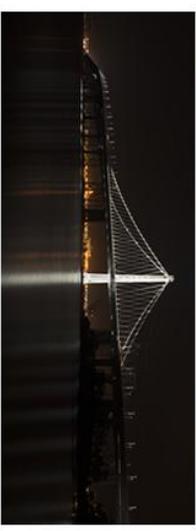
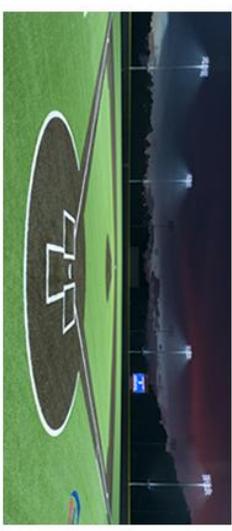
Group Summary			
Group	Description	Load	Fixture Qty
A	Basketball	3.55 kW	9
B	Skate Park	2.36 kW	6
C	Area	3.15 kW	8

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
96 LED	LED 5700K - 75 CRI	394W	38,600	61,000	>72,000	>72,000	23

Light Level Summary

Calculation Grid Summary							
Grid Name	Calculation Metric	Illumination				Groups	Fixture Qty
		Ave	Min	Max	Max/Min		
Area	Horizontal Illuminance	5.90	0	13	163.00	C	8
Basketball-2	Horizontal Illuminance	20.8	14	25	1.82	A	9
Basketball	Horizontal Illuminance	20.5	14	26	1.82	A	9
Corner Grid	Horizontal	5.60	0	18	323.78	A	9
Open Area	Horizontal Illuminance	5.10	0	13	31.85	C	8
Skate Park	Horizontal Illuminance	18.8	6	29	4.61	B	6

From Hometown to Professional



EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires				
					TYPE	POLE GRID	THIS OTHER GRIDS		
1	B1	50'	-	50'	96 LED	4/1*	5	0	
1	B2	50'	-	50'	96 LED	4/3*	4	3	
TOTALS							12	9	3

* This structure utilizes a back-to-back mounting configuration

Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name: Basketball
 Size: 84' x 50'
 Spacing: 10.0' x 10.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

Entire Grid

Guaranteed Average: 20

Scan Average: 20.5

Maximum: 26

Minimum: 14

Avg / Min: 1.43

Guaranteed Max / Min: 2

Max / Min: 1.82

UG (adjacent pts): 1.34

CU: 0.27

No. of Points: 40

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI

Luminaire Output: 38,600 Lumens

No. of Luminaires: 9

Total Load: 3.55 kW

Lumen Maintenance

Luminaire Type 96 LED

L90 hrs 61,000

L80 hrs >72,000

L70 hrs >72,000

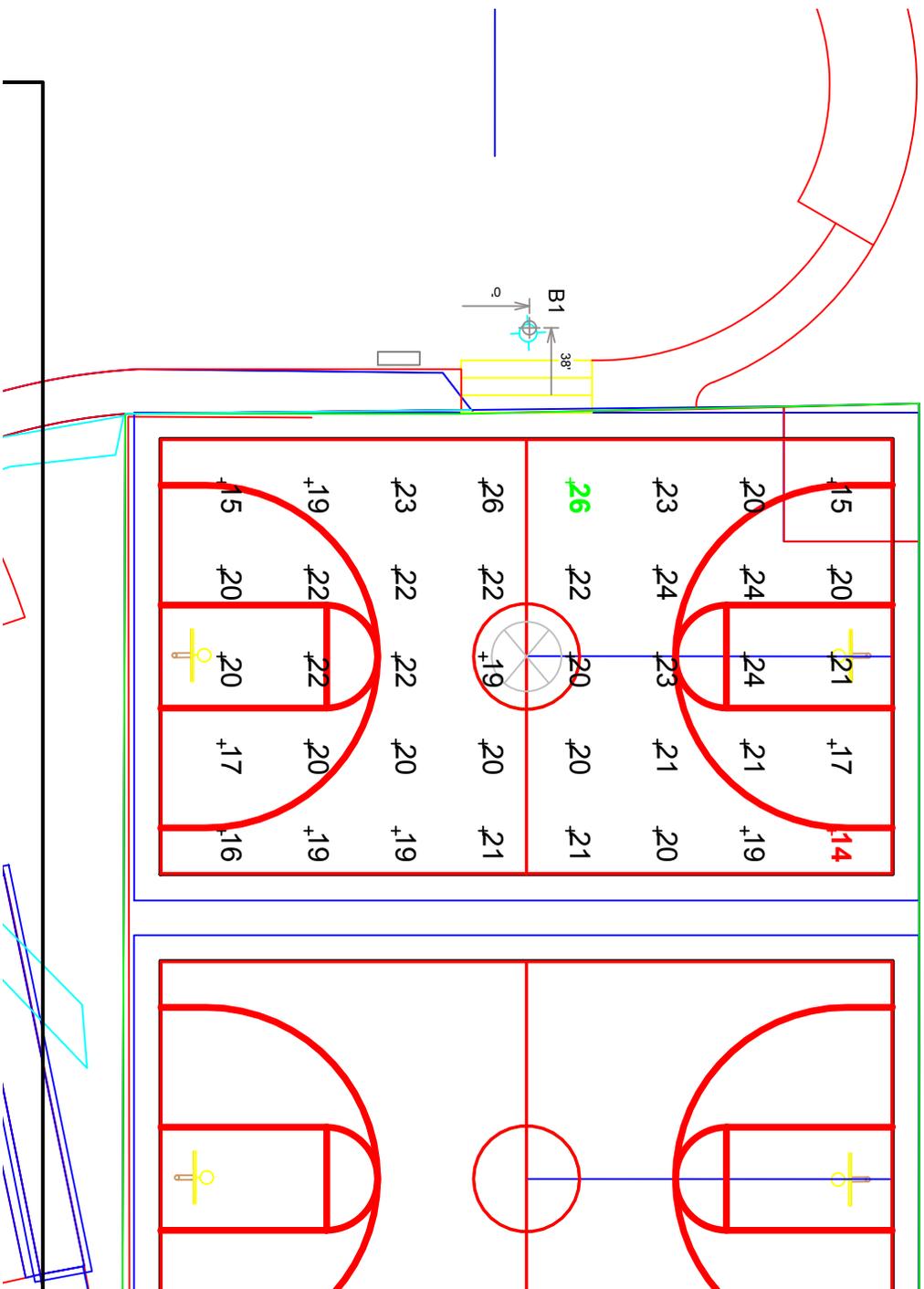
Reported per TM-21-11. See cutsheets for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



SCALE IN FEET 1 : 20



Pole location(s) Ⓢ dimensions are relative to 0.0 reference point(s) ⊗



EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires				
					LUMINAIRE TYPE	QTY/ POLE	THIS GRID OTHER GRIDS		
1	B1	50'	-	50'	96 LED	4/1*	5	0	
1	B2	50'	-	50'	96 LED	4/3*	4	3	
TOTALS							12	9	3

* This structure utilizes a back-to-back mounting configuration

Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name: Corner Grid
Size: 84' x 50'
Spacing: 10.0' x 10.0'
Height: 3.0' above grade

ILLUMINATION SUMMARY

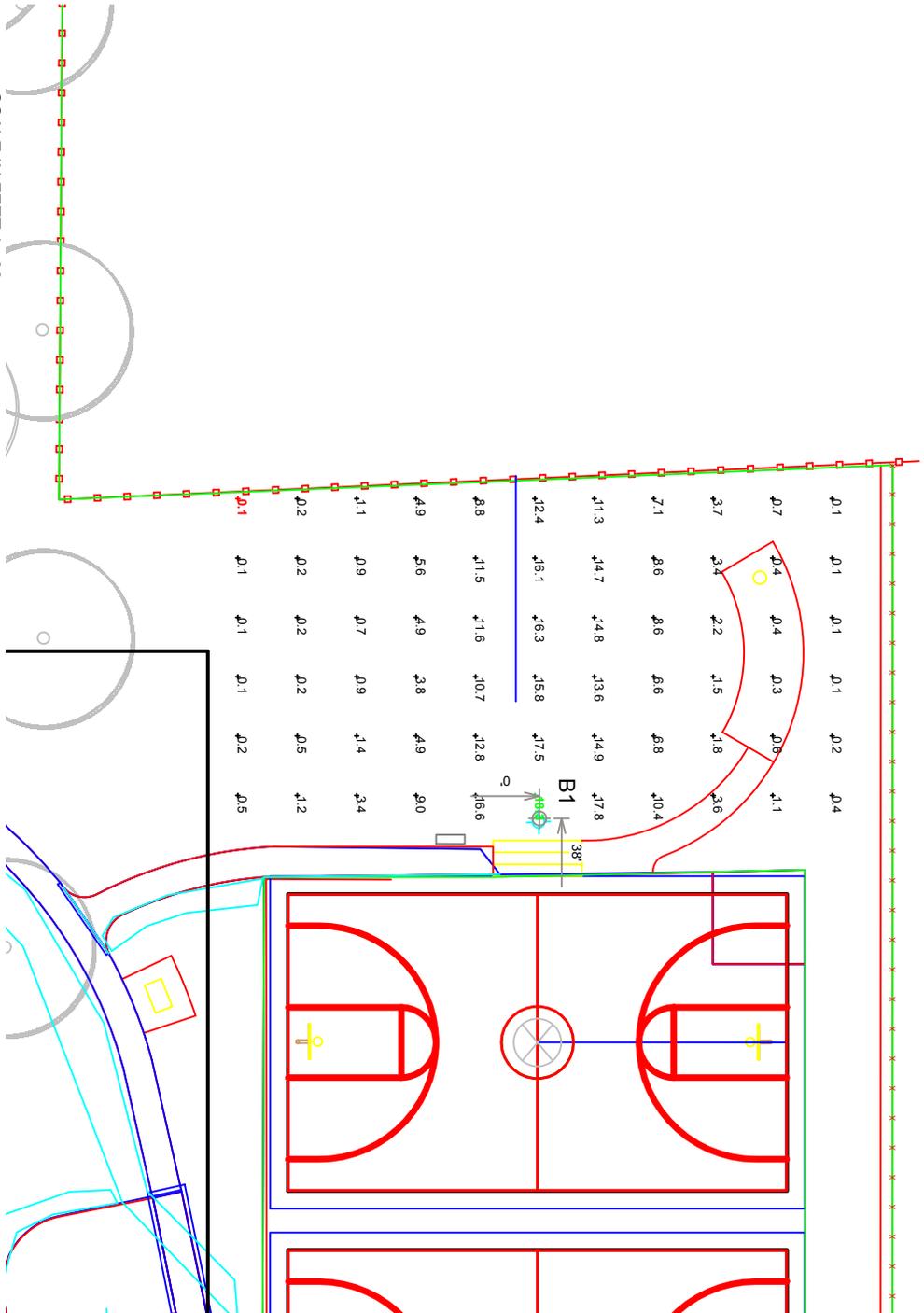
HORIZONTAL FOOTCANDLES			
Entire Grid	Scan Average: 5.6		
	Maximum:	18	
	Minimum:	0	
	Avg / Min:	98.69	
UG (adjacent pts):	Max / Min:	323.78	
CU:	8.05		
No. of Points:	0.12		
	66		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	38,600 lumens		
No. of Luminaires:	9		
Total Load:	3.55 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
96 LED	61,000	>72,000	>72,000
Reported per TM-21-11. See cutsheets for details.			

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



SCALE IN FEET 1 : 30



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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires				
					LUMINAIRE TYPE	QTY/ POLE	THIS GRID	OTHER GRIDS	
1	B1	50'	-	50'	96 LED	4/1*	5	0	
1	B2	50'	-	50'	96 LED	4/3*	4	3	
				TOTALS			12	9	3

* This structure utilizes a back-to-back mounting configuration

Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name: Basketball-2
 Size: 84' x 50'
 Spacing: 10.0' x 10.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

Entire Grid

Guaranteed Average: 20

Scan Average: 20.8

Maximum: 25

Minimum: 14

Avg / Min: 1.52

Guaranteed Max / Min: 2

Max / Min: 1.82

UG (adjacent pts): 1.40

CU: 0.28

No. of Points: 40

LUMINAIRE INFORMATION

Color / CRI: 5700K - 75 CRI

Luminaire Output: 38,600 lumens

No. of Luminaires: 9

Total Load: 3.55 kW

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
96 LED	61,000	>72,000	>72,000

Lumen Maintenance
 Reported per TM-21-11. See cutsheets for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

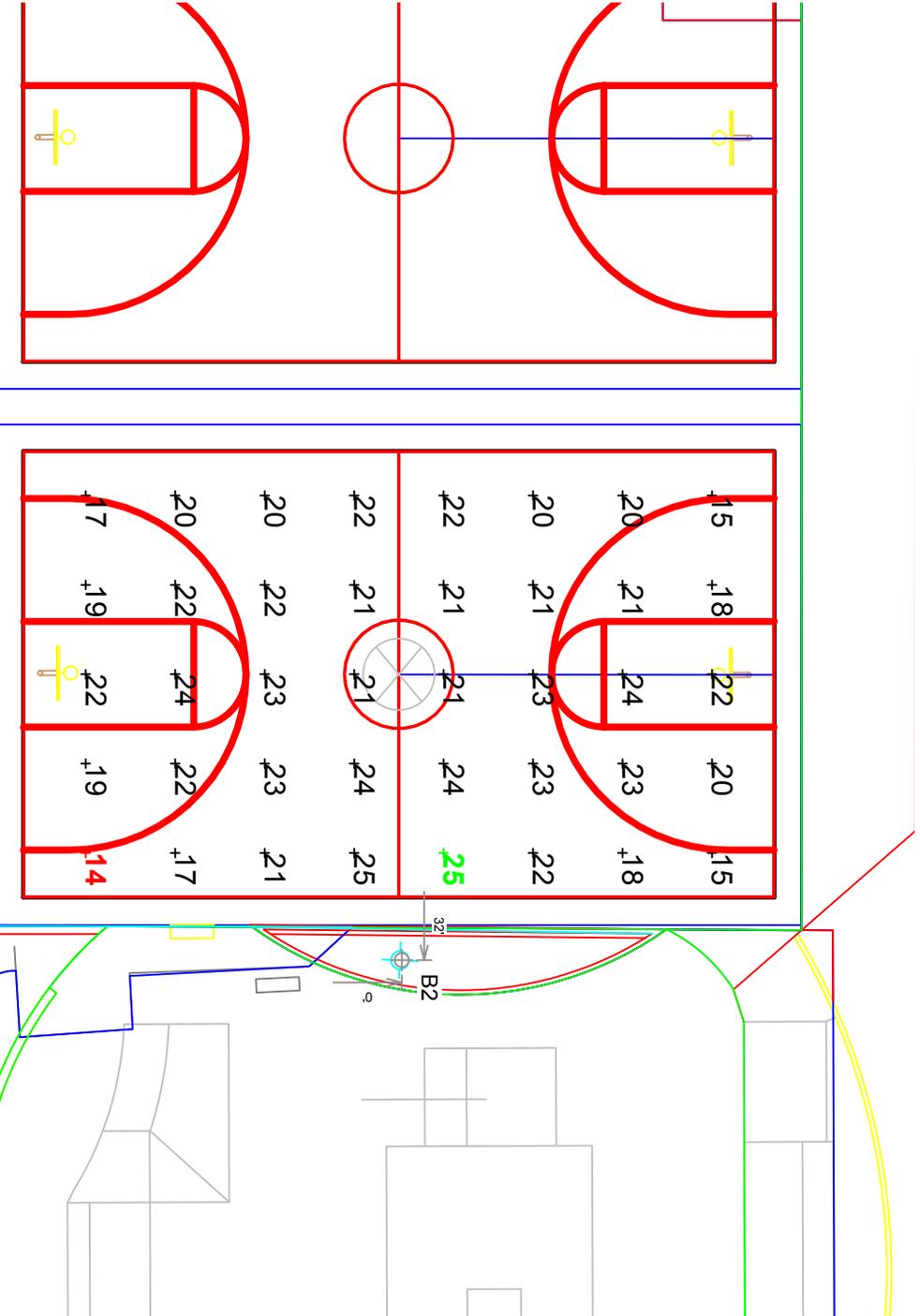
Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY



SCALE IN FEET 1 : 20



Pole location(s) Ⓢ dimensions are relative to 0.0 reference point(s) ⊗

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EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	Luminaires			
						POLE	THIS GRID	OTHER GRIDS	
1	B2	50'	-	50'	96 LED	4/3*	3	4	
1	B3	50'	-	50'	96 LED	3	3	0	
TOTALS							10	6	4

* This structure utilizes a back-to-back mounting configuration

Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name: **Skate Park**
 Spacing: 10.0' x 10.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

Scan Average:	18.8		
Maximum:	29		
Minimum:	6		
Avg / Min:	3.03		
Max / Min:	4.61		
UG (adjacent pts):	1.77		
CU:	0.72		
No. of Points:	77		
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	38,500 lumens		
No. of Luminaires:	6		
Total Load:	2.36 kW		
Lumen Maintenance			
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
96 LED	61,000	>72,000	>72,000

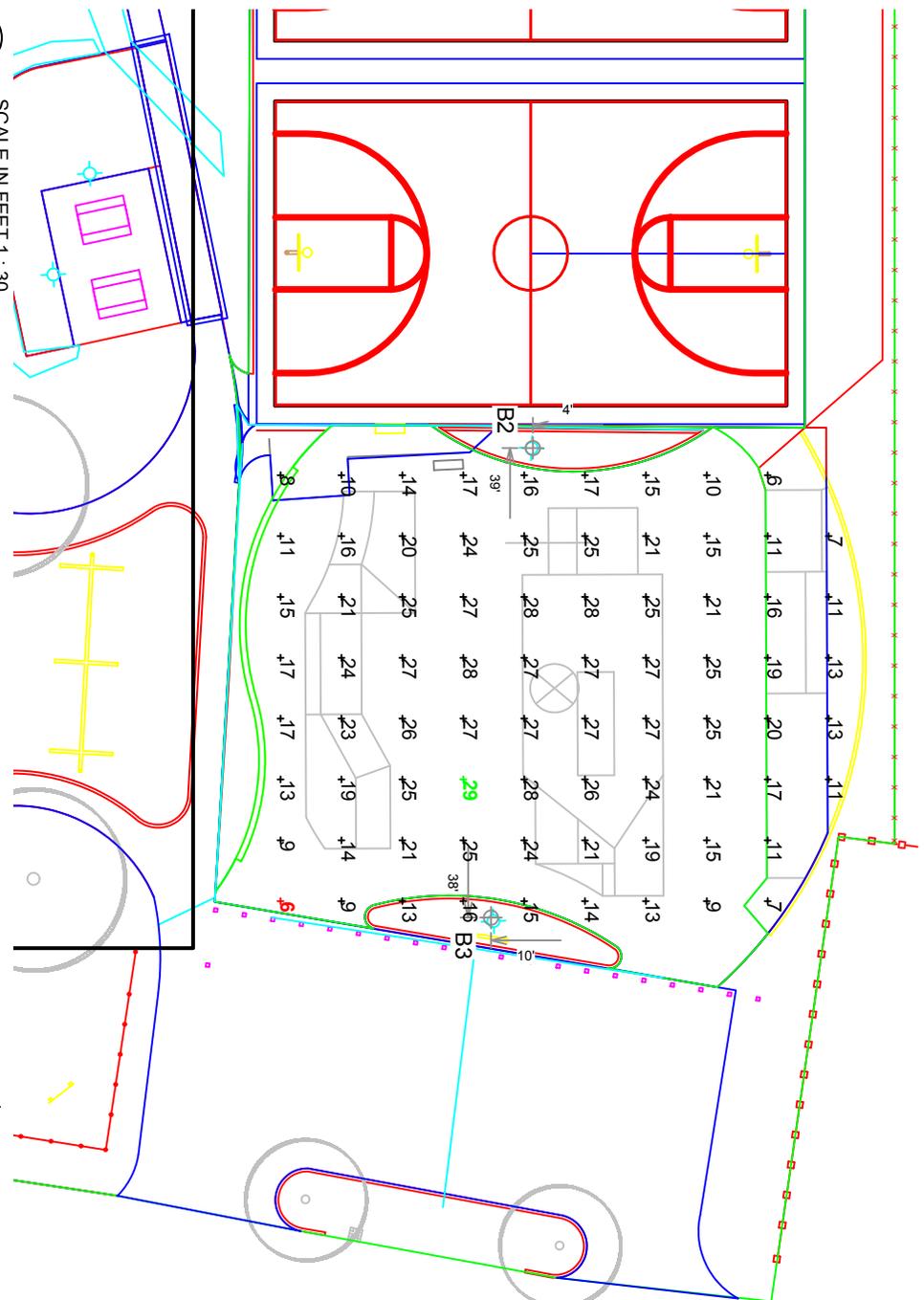
Reported per TM-21-11. See cutsheets for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



SCALE IN FEET 1 : 30



Pole location(s) ⊕ dimensions are relative to 0.0 reference point(s) ⊗

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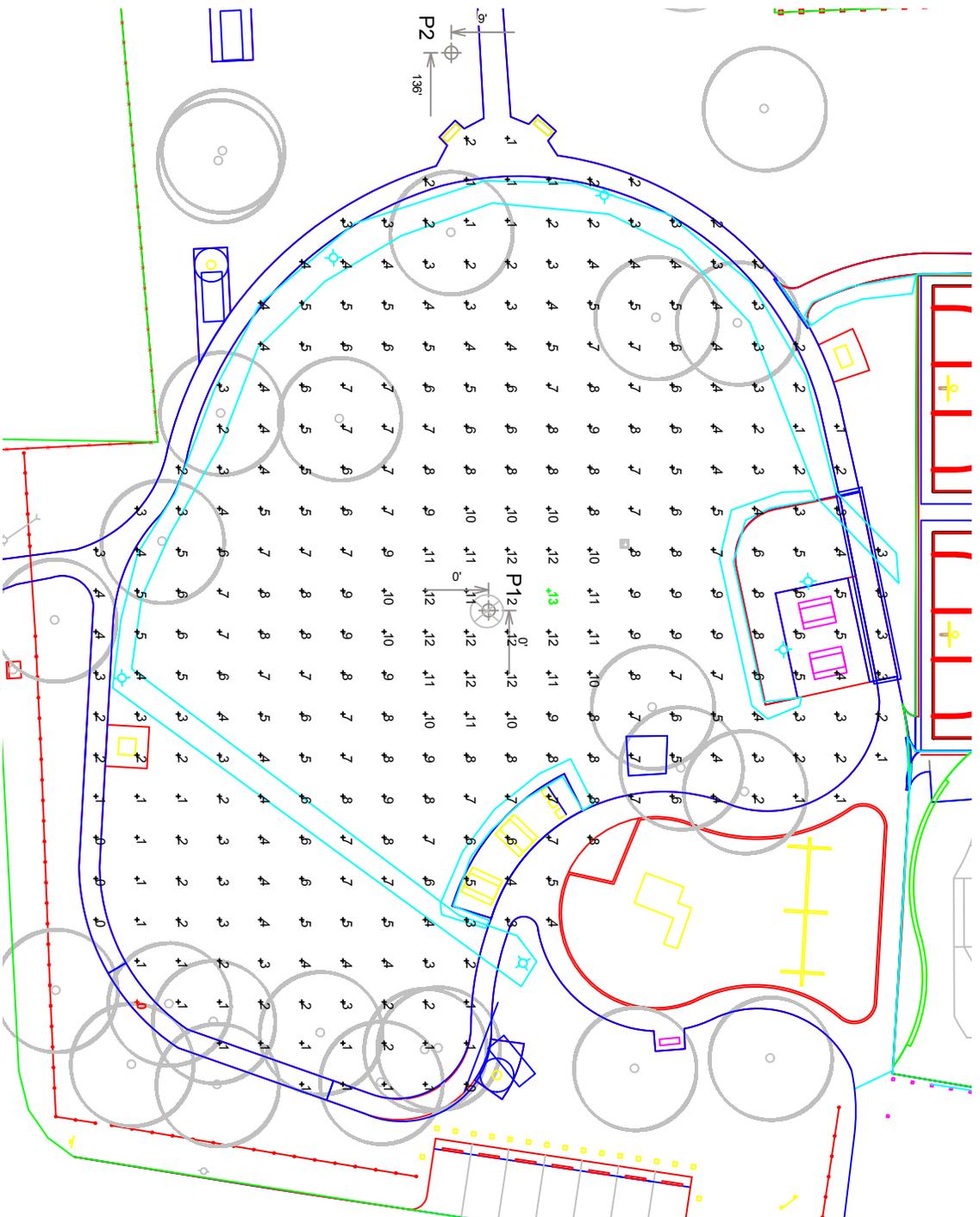
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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	Pole SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires				
					LUMINAIRE TYPE	QTY/ POLE	THIS GRID OTHER GRIDS		
1	P1	60"	-	60"	96 LED	3/3*	6	0	
2	P2	50"	-	50"	96 LED	2	2	0	
TOTALS							8	8	0

* This structure utilizes a back-to-back mounting configuration



SCALE IN FEET 1 : 40

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Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name: Open Area
 Size: 240' x 190'
 Spacing: 10.0' x 10.0'
 Height: 3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES

Scan Average: 5.1
 Maximum: 13
 Minimum: 0
 Avg / Min: 13.03
 Max / Min: 31.85
 UG (adjacent pts): 2.29
 CU: 0.64
 No. of Points: 329

Color / CRI: 5700K - 75 CRI
 Luminaire Output: 38,600 lumens
 No. of Luminaires: 8
 Total Load: 3.15 kW

Luminaire Type	L90 hrs	L80 hrs	L70 hrs
96 LED	61,000	>72,000	>72,000

Lumen Maintenance
 Reported per TM-21-11. See cutsheets for details.

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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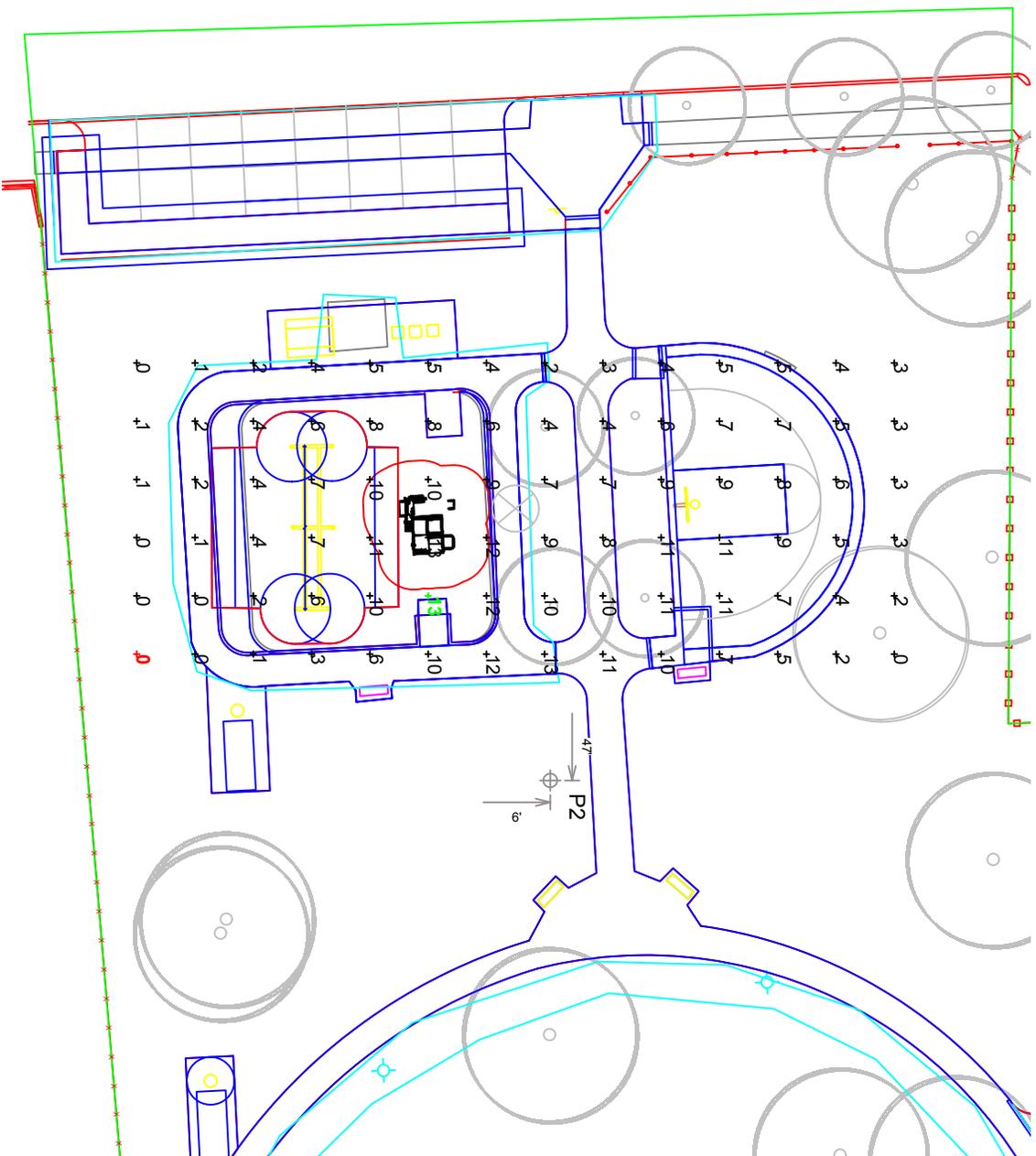
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ILLUMINATION SUMMARY

EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	Luminaires				
					LUMINAIRE TYPE	QTY/ POLE	THIS GRID OTHER GRIDS		
1	P1	60"	-	60"	96 LED	3/3*	6	0	
1	P2	50"	-	50"	96 LED	2	2	0	
TOTALS							8	8	0

* This structure utilizes a back-to-back mounting configuration



Central Ave Playground Basketball

East Providence, RI

GRID SUMMARY

Name:	Area
Size:	60' x 130'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

HORIZONTAL FOOTCANDLES			
Entire Grid	Scan Average:	5.9	
	Maximum:	13	
	Minimum:	0	
	Avg / Min:	73.93	
	Max / Min:	163.00	
UG (adjacent pts):		4.53	
CU:		0.19	
No. of Points:		84	
LUMINAIRE INFORMATION			
Color / CRI:	5700K - 75 CRI		
Luminaire Output:	38,600 lumens		
No. of Luminaires:	8		
Total Load:	3.15 kW		
Luminaire Type	L90 hrs	L80 hrs	L70 hrs
96 LED	61,000	>72,000	>72,000
Lumen Maintenance			
Reported per TM-21-11. See cutsheets for details.			

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA LM-5-04.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume +/- 5% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY

SCALE IN FEET 1 : 30
 0' 30' 60'

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Central Ave Playground Basketball

East Providence, RI

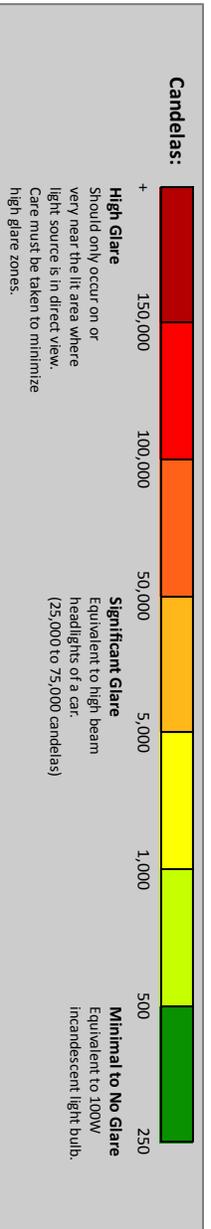
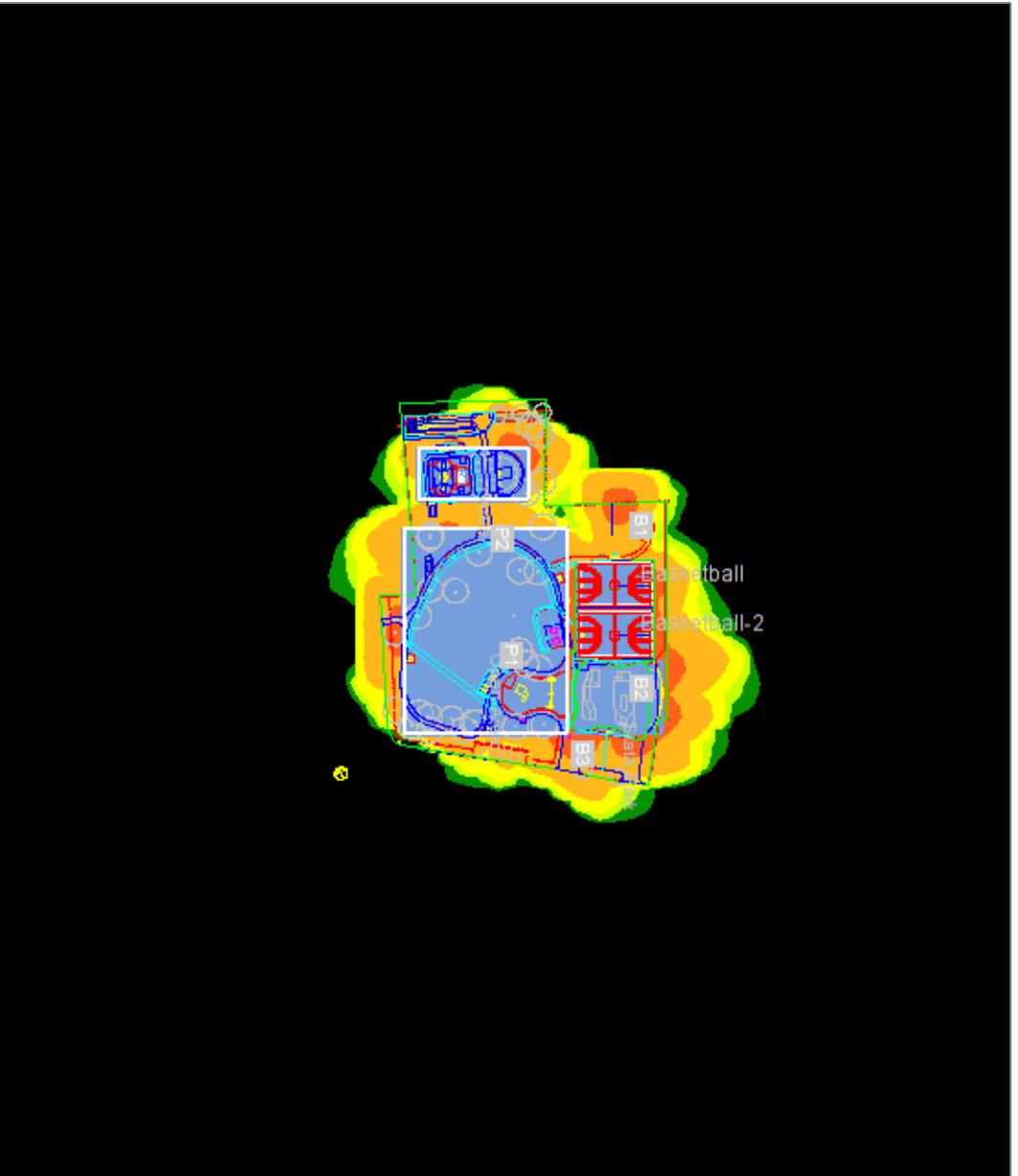
GLARE IMPACT

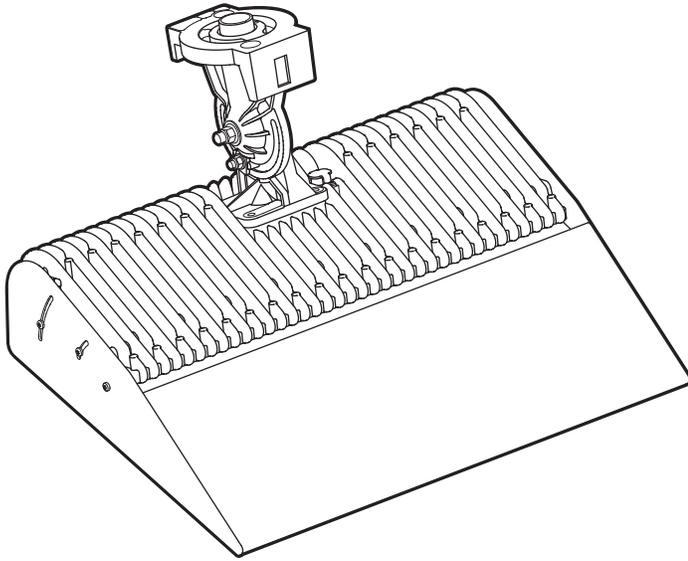
Summary

The Maximum Candela map indicates the maximum candela achieved at a point (ground level) from any source. This can be used to approximate the amount of glare an observer would be subjected to when viewing the lit environment. It assumes that the observer would face the brightest light source in any direction.

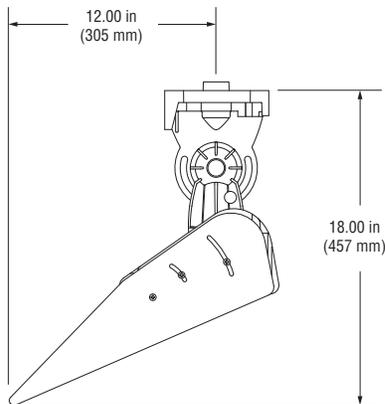
While very high candela values are reported on or very near the application area, the goal of the lighting system is to control the light such that the impact off-site is minimal.

Values at or below 500 candelas will result in no discomfort glare.

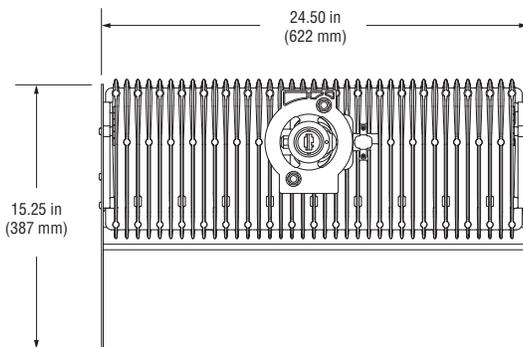




Side



Top



Luminaire Data

Weight (luminaire) 35 lb (16 kg)
 UL listing number E338094
 UL Listed for USA / Canada UL1598
 CSA-C22.2 No. 250.0
 Material and finish Die-cast aluminum,
 anodized, CASTGUARD™ coated,
 and powder-coat painted
 Wind speed rating (aiming only) 150 mi/h (67 m/s)

Photometric Characteristics

Projected lumen maintenance per IES TM-21-11
 L90 (12K) 61,000 h
 L80 (12K) >72,000 h
 L70 (12K) >72,000 h
 CIE correlated color temperature 5700 K
 Color Rendering Index (CRI) 65–70
 Lumens¹ 38,600

Footnotes:

1) Incorporates appropriate dirt depreciation factor for life of luminaire.

Datasheet: 96 LED Luminaire and Driver

Driver Data

Electrical Data

Rated Wattage¹

Per driver 788 W
 Per luminaire 394 W

Number of luminaires per driver 2

Starting (inrush) current <40 A, 256 μ s

Fuse Rating 15 A

UL ambient temperature rating 50°C
 (122°F)

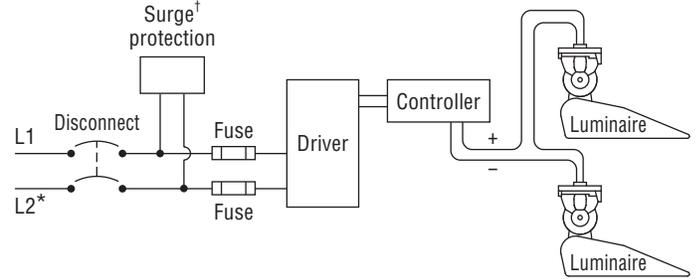
Efficiency 95%

Dimming mode optional

Range, energy consumption 15–100%

Range, light output 20–100%

Typical Wiring



* If L2 (com) is neutral then not switched or fused.
 † Not present if indoor installation.

	208 Vac 60 Hz	220 Vac 50/60 Hz	230 Vac 50 Hz	240 Vac 50/60 Hz	277 Vac 60 Hz	347 Vac 60 Hz	380 Vac 50 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current per driver²	4.92 A	4.66 A	4.44 A	4.26 A	3.70 A	2.96 A	2.70 A	2.56 A	2.48 A	2.14 A

Footnotes:

- 1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25° C ambient temperature environment.
- 2) Operating current includes allowance for 0.90 minimum power factor, operating temperature, and LED light source manufacturing tolerances.

Notes

1. Use thermal magnetic HID-rated or D-curve circuit breakers.
2. See *Musco Control System Summary* for circuit information.



Model 96 LED
 (347–480V only)



Light-Structure Green™ System

Diode Light Source – LED

For your
BUDGET,
for the
ENVIRONMENT.

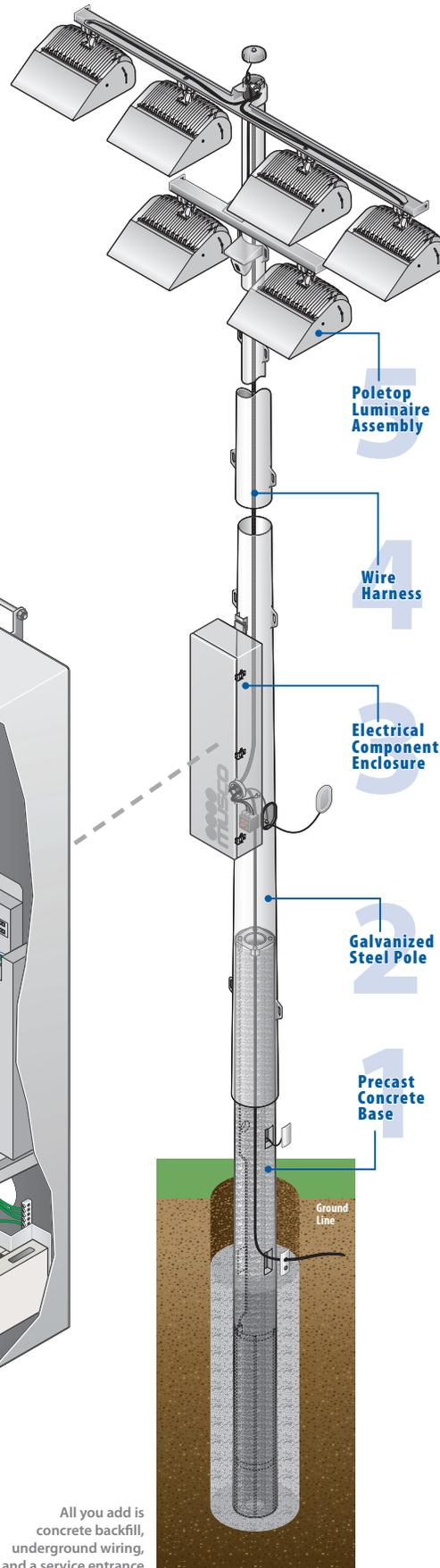
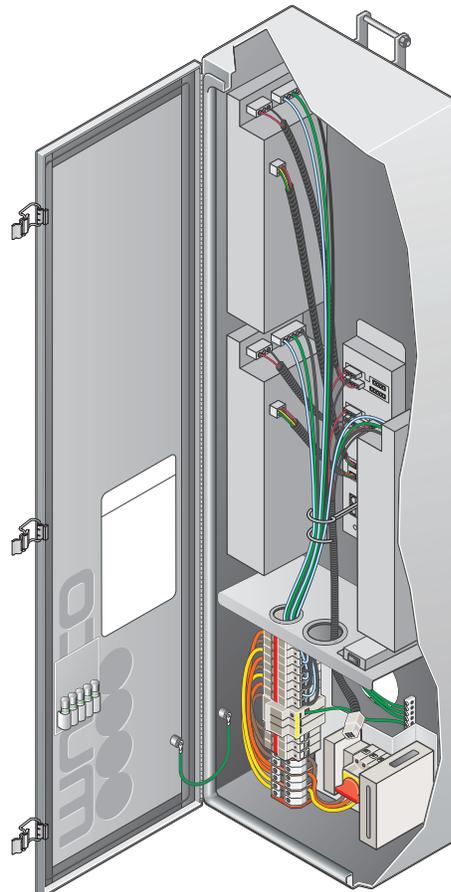
5 Easy Pieces™
Complete System from
Foundation to Poletop

Factory wired, aimed, and tested

Fast, trouble-free installation

Comprehensive corrosion package

Integrated lightning ground system



All you add is
concrete backfill,
underground wiring,
and a service entrance