CITY OF COSTA MESA
PUBLIC WORKS AGREEMENT FOR
CITY PROJECT NO. 23-09

This PUBLIC WORKS AGREEMENT ("Agreement") is dated January 16, 2024, and is between the CITY OF COSTA MESA, a municipal corporation ("CITY") and RMF CONTRACTING, INC., dba R&M Electrical Contractor ("CONTRACTOR").

WHEREAS, CITY desires to construct the public improvements described below under Paragraph 1, Scope of Work (the "Project");

WHEREAS, CITY has determined that CONTRACTOR is the lowest responsible bidder;

WHEREAS, CITY now desires to contract with CONTRACTOR to furnish construction and related services for the Project; and

WHEREAS, CITY and CONTRACTOR desire to set forth their rights, duties and liabilities in connection with the services to be performed.

NOW, THEREFORE, for and in consideration of the covenants and conditions contained herein, the parties hereby agree as follows:

1. SCOPE OF WORK.

The scope of work generally consists of installing LED lights at various CITY parks and athletic facilities throughout the CITY (the "Work").

The Work is further described in the "Contract Documents" referred to below.

The Project is known as the Athletic Facilities Project, City Project No. 23-09 (the "Project").

2. CONTRACT DOCUMENTS.

The complete Agreement consists of the following documents relating to the Project:

(a) This Agreement;

(b) CONTRACTOR's bid, attached hereto as Exhibit A and incorporated herein;

(c) Bid package, including, but not limited to, notice inviting bids, complete plans, profiles, detailed drawings and specifications, general provisions and special provisions, attached hereto as Exhibit B and incorporated herein;

(d) Faithful Performance Bond and Labor and Material Bond, including agent's Power of Attorney for each bond, attached hereto as Exhibit C;

(e) Drug-Free Workplace Policy, attached hereto as Exhibit D and incorporated herein; and

(f) Provisions of the most current edition of The Greenbook: Standard Specifications for Public Works Construction ("The Greenbook"). Provisions of The Greenbook are incorporated by this reference as if fully set forth herein.

The documents comprising the complete Agreement will be referred to as the "Contract Documents."

All of the Contract Documents are intended to complement one another, so that any Work called for in one and not mentioned in another is to be performed as if mentioned in all documents.

In the event of an inconsistency in the Contract Documents, the terms of this Agreement shall prevail over all other Contract Documents. The order of precedence between the remaining Contract Documents shall be as set forth in The Greenbook.

The Contract Documents constitute the entire agreement between the parties and supersede any and all other writings and oral negotiations.

3. CITY'S REPRESENTATIVE.

The CITY's Representative is Robert Ryan, referred to herein as the Project Manager ("Project Manager").

4. CONTRACTOR'S PROJECT MANAGER; PERSONNEL.

(a) Project Manager. CONTRACTOR's Project Manager must be approved by CITY. Such approval shall be at CITY's sole discretion.

(b) Personnel. CITY has the right to review and approve any personnel who are assigned to perform work under this Agreement. CONTRACTOR shall remove personnel from performing work under this Agreement if requested to do so by CITY.

This Paragraph 4 is a material provision of the Agreement.

5. SCHEDULE.

All Work shall be performed in accordance with the schedule approved on behalf of CITY by the Project Manager, and in accordance with the time of performance set forth in Paragraph 11 (Time of Performance).

6. EQUIPMENT - PERFORMANCE OF WORK.

CONTRACTOR shall furnish all tools, equipment, apparatus, facilities, labor and materials necessary to perform and complete the Work in a good and workmanlike manner in strict conformity with the Contract Documents.

The equipment, apparatus, facilities, labor and material shall be furnished and such Work performed and completed as required in the plans and specifications to the satisfaction of the Project Manager or his or her designee, and subject to his or her approval.

7. COMPENSATION.

CITY shall pay CONTRACTOR in accordance with the fee schedule set forth in CONTRACTOR's Bid within Exhibit A. CONTRACTOR's total compensation shall not exceed Seven Hundred Fifty-Nine Thousand Seven Hundred Dollars ($759,700.00).

8. ADDITIONAL SERVICES.

CONTRACTOR shall not receive compensation for any services provided outside the scope of the Contract Documents unless such additional services, including change orders, are approved in writing by CITY prior to CONTRACTOR performing the additional services.

It is specifically understood that oral requests or approvals of such additional services, change orders or additional compensation and any approvals from CITY shall be barred and are unenforceable.

9. PAYMENTS TO CONTRACTOR.

On or before the last Monday of each and every month during the performance of the Work, CONTRACTOR shall meet with the Project Manager or his or her designee to determine the quantity of pay items incorporated into the improvement during that month. A "Progress Payment Order" will then be jointly prepared, approved, and signed by the Project Manager and the CONTRACTOR setting forth the amount to be paid and providing for a five percent (5%) retention. Upon approval of the progress payment order by the Project Manager, or his or her designee, it shall be submitted to CITY's Finance Department and processed for payment by obtaining approval from the City Council to issue a warrant.

Within three (3) days following City Council's approval to issue a warrant, CITY shall mail to CONTRACTOR a warrant for the amount specified in the progress payment order as the amount to be paid. The retained five percent (5%) shall be paid to CONTRACTOR thirty-five (35) days after the recording of the Notice of Completion of the Work by the CITY with the Orange County Clerk-Recorder and after CONTRACTOR has

furnished releases of all claims against CITY by persons who furnished labor or materials for the Work, if required by CITY.

Upon the request of CONTRACTOR and at its expense, securities equivalent to the amount withheld pursuant to the foregoing provisions may be presented to CITY for substitution for the retained funds. If CITY approves the form and amount of the offered securities it will release the retained funds and will hold the securities in lieu thereof. CONTRACTOR shall be entitled to any interest earned on the securities.

In the event that claims for property damage or bodily injury are presented to CITY arising out of CONTRACTOR's or any subcontractor's work under this Agreement, CITY shall give notice thereof to CONTRACTOR, and CONTRACTOR shall have thirty-five (35) days from the mailing of any such notice to evaluate the claim and to settle it by whole or partial payment, or to reject it, and to give notice of settlement or rejection to CITY. If CITY does not receive notice within the above-mentioned 35-day period that the claim has been settled, and if the Project Manager, after consultation with the City Attorney, determines that the claim is meritorious, CITY may pay the claim or a portion of it in exchange for an appropriate release from the claimant, and may deduct the amount of the payment from the retained funds that would otherwise be paid to CONTRACTOR upon completion of the Work; provided, however, that the maximum amount paid for any one claim pursuant to this provision shall be One Thousand Dollars ($1,000.00), and the maximum amount for all such claims in the aggregate paid pursuant to this provision shall be Five Thousand Dollars ($5,000.00).

10. PROMPT PAYMENT OF SUBCONTRACTORS.

CONTRACTOR agrees to pay each subcontractor under this Agreement for satisfactory performance of its contract no later than seven (7) days from the receipt of each payment the CONTRACTOR receives from CITY.

CONTRACTOR agrees further to release retainage payments to each subcontractor within thirty (30) days after the subcontractor's work is satisfactorily completed.

Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the CITY.

11. TIME OF PERFORMANCE.

CONTRACTOR shall commence Work by the date specified in CITY's Notice to Proceed, unless a later date is agreed upon in writing by the parties. The Work shall be completed within forty 40 calendar days from the first day of commencement of the Work.

12. TERMINATION.

(a) Termination for Convenience. CITY may terminate this Agreement at any

time, with or without cause, by providing thirty (30) days' written notice to CONTRACTOR.

(b) Termination for Breach of Contract.

(i) If CONTRACTOR refuses or fails to prosecute the Work or any severable part of it with such diligence as will ensure its timely completion, or if CONTRACTOR fails to complete the Work on time, or if CONTRACTOR, or any subcontractor, violates any of the provisions of the Contract Documents, the Project Manager may give written notice to CONTRACTOR and CONTRACTOR's sureties of the CITY's intention to terminate this Agreement; and, unless within five (5) days after the serving of that notice, such conduct shall cease and arrangements for the correction thereof be made to the satisfaction of the CITY, this Agreement may be terminated at the option of CITY effective upon CONTRACTOR's receipt of a second notice sent by the CITY indicating that the CITY has exercised its option to terminate.

(ii) If CONTRACTOR is adjudged bankrupt or files for any relief under the Federal Bankruptcy Code or State insolvency laws, this Agreement shall automatically terminate without any further action or notice by CITY.

(iii) If CONTRACTOR is in breach of any material provision of this Agreement, CITY may immediately terminate this Agreement by providing written notice to CONTRACTOR of same.

13. LIQUIDATED DAMAGES.

In the event the scope of work is not completed, for any reason, within the time required including any approved extensions of time, and to the satisfaction of the Project Manager, CITY may, in addition to any other remedies, equitable and legal, including remedies authorized by Paragraph 12 (Termination) of this Agreement, charge to CONTRACTOR or its sureties, or deduct from payments or credits due CONTRACTOR, a sum equal to Ten Percent (10%) of the total bid price liquidated damages for each calendar day beyond the date provided for the completion of such work.

The parties hereto agree that the amount set forth above, as liquidated damages constitutes a fair and reasonable estimate of the costs the CITY would suffer for each day that the CONTRACTOR fails to meet the performance schedule. The parties hereby agree and acknowledge that the delays in the performance schedule will cause CITY to incur costs and expenses not contemplated by this Agreement.

14. PERFORMANCE BY SURETIES.

In the event CONTRACTOR fails or refuses to perform the Work, CITY may provide CONTRACTOR with a notice of intent to terminate as provided in Paragraph 12

(Termination), of this Agreement. CITY shall immediately give written notice of such intent to terminate to CONTRACTOR and CONTRACTOR's surety or sureties, and the sureties shall have the right to take over and perform this Agreement; provided, however, that the sureties must, within five (5) days after CITY's giving notice of termination, (a) give the CITY written notice of their intention to take over the performance of this Agreement; (b) provide adequate assurances, to the satisfaction of the CITY, that the Work shall be performed diligently and in a timely manner; and (c) must commence performance thereof within five (5) days after providing notice to the CITY of their intention to take over the Work. Upon the failure of the sureties to comply with the provisions set forth above, CITY may take over the Work and complete it, at the expense of CONTRACTOR, and the CONTRACTOR and the sureties shall be liable to CITY for any excess costs or damages including those referred to in Paragraph 13 (Liquidated Damages), incurred by CITY. In such event, CITY may, without liability for so doing, take possession of such materials, equipment, tools, appliances, Contract Documents and other property belonging to CONTRACTOR as may be on the site of the Work and reasonably necessary therefor and may use them to complete the Work.

15. DISPUTES PERTAINING TO PAYMENT FOR WORK.

Should any dispute arise respecting whether any delay is excusable, or its duration, or the value of the Work done, or of any Work omitted, or of any extra Work which CONTRACTOR may be required to do, or respecting any payment to CONTRACTOR during the performance of this Agreement, such dispute shall be decided by the Project Manager, and his or her decisions shall be final and binding upon CONTRACTOR and its sureties.

16. SUPERINTENDENCE BY CONTRACTOR.

At all times during performance of the Work, CONTRACTOR shall give personal superintendence or have a competent foreman or superintendent on the worksite, with authority to act for CONTRACTOR.

17. INSPECTION BY CITY.

CONTRACTOR shall at all times maintain proper facilities and provide safe access for inspection by CITY to all parts of the Work and to all shops on or off-site where the Work or portions of the Work, are in preparation. CITY shall have the right of access to the premises for inspection at all times. However, CITY shall, at all times, comply with CONTRACTOR's safety requirements on the job site.

18. CARE OF THE WORK AND OFF-SITE AUTHORIZATION.

CONTRACTOR warrants that it has examined the site of the Work and is familiar with its topography and condition, location of property lines, easements, building lines and other physical factors and limitations affecting the performance of this Agreement. CONTRACTOR, at CONTRACTOR's sole cost and expense, shall obtain any permission,

and all approvals, licenses, or easements necessary for any operations conducted off the premises owned or controlled by CITY. CONTRACTOR shall be responsible for the proper care and protection of all materials delivered to the site or stored off-site and for the Work performed until completion and final inspection and acceptance by CITY. The risk, damage or destruction of materials delivered to the site or to Work performed shall be borne by CONTRACTOR.

19. CONTRACT SECURITY AND GUARANTEE.

CONTRACTOR shall furnish, concurrently with the execution of this Agreement, the following: (1) a surety bond in an amount equal to one hundred percent (100%) of the contract price as security for the faithful performance of this Agreement, and (2) a separate surety bond in an amount equal to at least one hundred percent (100%) of the contract price as security for the payment of all persons furnishing labor or materials in connection with the Work under this Agreement. Sureties for each of the bonds and the forms thereof shall be satisfactory to CITY. In addition, such sureties must be authorized to issue bonds in California; sureties must be listed on the latest revision to the U.S. Department of the Treasury Circular 570; and must be shown to have sufficient bonding capacity to provide the bonds required by the Contract Documents.

CONTRACTOR shall provide a certified copy of the certificate of authority of the surety issued by the Insurance Commissioner; a certificate from the clerk of the county in which the court or officer is located that the certificate of authority of the surety has not been surrendered, revoked, canceled, annulled, or suspended or, in the event that it has, that renewed authority has been granted; and copies of the surety's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with Section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code.

CONTRACTOR guarantees that all materials used in the Work and all labor performed shall be in conformity with the Contract Documents including, but not limited to, the standards and specifications set forth in the most current edition of The Greenbook. CONTRACTOR shall, at its own expense, make any and all repairs and replacements that shall become necessary as the result of any failure of the Work to conform to the aforementioned Contract Documents, and/or standard specifications; provided, however, that CONTRACTOR shall be obligated under this provision only to the extent of those failures or defects of which CONTRACTOR is given notice within a period of twelve (12) months from the date that the Notice of Completion is recorded.

The rights and remedies available to CITY pursuant to this provision shall be cumulative with all rights and remedies available to CITY pursuant to statutory and common law, which rights and remedies are hereby expressly reserved, and neither the foregoing guarantee by CONTRACTOR nor its furnishing of the bonds, nor acceptance thereof by CITY, shall constitute a waiver of any rights or remedies available to CITY against CONTRACTOR.

20. INDEMNIFICATION.

CONTRACTOR agrees to protect, defend, indemnify and hold harmless CITY and its elected and appointed boards, officers, agents, and employees from any and all claims, liabilities, expenses, or damages of any nature, including attorneys' fees, for injury to or death of any person, and for injury or damage to any property, including consequential damages of any nature resulting therefrom, arising out of or in any way connected with the performance of this Agreement. The defense obligation provided for hereunder shall apply without any advance showing of negligence or wrongdoing by the CONTRACTOR, its employees, and/or authorized subcontractors, but shall be required whenever any claim, action, complaint, or suit asserts as its basis the negligence, errors, omissions or misconduct of the CONTRACTOR, its employees, and/or authorized subcontractors, and/or whenever any claim, action, complaint or suit asserts liability against the CITY, its elected officials, officers, agents and employees based upon the work performed by the CONTRACTOR, its employees, and/or authorized subcontractors under this Agreement, whether or not the CONTRACTOR, its employees, and/or authorized subcontractors are specifically named or otherwise asserted to be liable. Notwithstanding the foregoing, the CONTRACTOR shall not be liable for the defense or indemnification of the CITY for claims, actions, complaints or suits arising out of the sole active negligence or willful misconduct of the CITY. This provision shall supersede and replace all other indemnity provisions contained either in the CITY's specifications or CONTRACTOR's proposal, which shall be of no force and effect.

CONTRACTOR shall comply with all of the provisions of the Workers' Compensation insurance laws and Safety in Employment laws of the State of California, including the applicable provisions of Divisions 4 and 5 of the California Labor Code and all amendments thereto and regulations promulgated pursuant thereto, and all similar State, Federal or local laws applicable; and CONTRACTOR shall indemnify and hold harmless CITY from and against all claims, liabilities, expenses, damages, suits, actions, proceedings and judgments, of every nature and description, including attorney fees, that may be presented, brought or recovered against CITY for or on account of any liability under or failure to comply with any of said laws which may be incurred by reason of any Work performed under this Agreement by CONTRACTOR or any subcontractor or others performing on behalf of CONTRACTOR.

CITY does not, and shall not, waive any rights against CONTRACTOR which it may have by reason of the above hold harmless agreements, because of the acceptance by CITY or the deposit with CITY by CONTRACTOR of any or all of the insurance policies described in Paragraph 21 (Insurance) of this Agreement.

The hold harmless agreements by CONTRACTOR shall apply to all liabilities, expenses, claims, and damages of every kind (including but not limited to attorneys' fees) incurred or alleged to have been incurred, by reason of the operations of CONTRACTOR or any subcontractor or others performing on behalf of CONTRACTOR, whether or not such insurance policies are applicable. CONTRACTOR shall require any and all tiers of subcontractors to afford the same degree of indemnification to the CITY OF COSTA

MESA and its elected and appointed boards, officers, agents, and employees that is required of CONTRACTOR and shall incorporate identical indemnity provisions in all contracts between CONTRACTOR and all tiers of its subcontractors.

In the event that CONTRACTOR and CITY are sued by a third party for damages caused or allegedly caused by negligent or other wrongful conduct of CONTRACTOR, or by a dangerous condition of CITY's property created by CONTRACTOR or existing while the property was under the control of CONTRACTOR, CONTRACTOR shall not be relieved of its indemnity obligation to CITY by any settlement with any such third party unless that settlement includes a full release and dismissal of all claims by the third party against the CITY.

21. INSURANCE.

(a) Minimum Scope and Limits of Insurance. CONTRACTOR shall not commence work under this Agreement until it has obtained all insurance required under this Paragraph 21 and CITY has approved the insurance as to form, amount, and carrier, nor shall CONTRACTOR allow any subcontractor to commence any Work until all similar insurance required of the subcontractor has been obtained and approved.

CONTRACTOR shall obtain, maintain, and keep in full force and effect during the life of this Agreement all of the following minimum scope of insurance coverages with an insurance company admitted to do business in California, rated "A," Class X, or better in the most recent Best's Key Insurance Rating Guide, and approved by CITY:

(i) Commercial general liability, including premises-operations, products/completed operations, broad form property damage, blanket contractual liability, independent contractors, personal injury or bodily injury with a policy limit of not less than One Million Dollars ($1,000,000.00) per occurrence. If such insurance contains a general aggregate limit, it shall apply separately to this Agreement or shall be twice the required occurrence limit.

(ii) Business automobile liability for owned vehicles, hired, and non-owned vehicles, with a policy limit of not less than One Million Dollars ($1,000,000.00) combined single limit per accident for bodily injury and property damage.

(iii) Workers' compensation insurance as required by the State of California, with Statutory Limits, and Employer's Liability insurance with a limit of no less than One Million Dollars ($1,000,000.00) per accident for bodily injury or disease. CONTRACTOR agrees to waive, and to obtain endorsements from its workers' compensation insurer waiving subrogation rights under its workers' compensation insurance policy against the CITY, its officers, agents, employees, and volunteers arising from work performed by

CONTRACTOR for the CITY and to require each of its subcontractors, if any, to do likewise under their workers' compensation insurance policies.

(iv) Umbrella or excess liability insurance that will provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary coverages set forth above, including commercial general liability, automobile liability, and employer's liability. Such policy or policies shall include the following terms and conditions:

(1) A drop down feature requiring the policy to respond in the event that any primary insurance that would otherwise have applied proves to be uncollectable in whole or in part for any reason;
(2) Pay on behalf of wording as opposed to reimbursement;
(3) Concurrency of effective dates with primary policies;
(4) Policies shall "follow form" to underlying primary policies; and
(5) Insureds under primary policies shall also be insureds under the umbrella or excess policies.

(b) Endorsements. The commercial general liability insurance policy and business automobile liability policy shall contain or be endorsed to contain the following provisions:

(i) Additional insureds: The City of Costa Mesa and its elected and appointed boards, officers, officials, agents, employees, and volunteers are additional insureds with respect to: liability arising out of activities performed by or on behalf of the CONTRACTOR pursuant to its contract with the City; products and completed operations of the CONTRACTOR; premises owned, occupied or used by the CONTRACTOR; automobiles owned, leased, hired, or borrowed by the CONTRACTOR."

(ii) Notice: "Said policy shall not terminate, nor shall it be canceled nor the coverage reduced, until thirty (30) days after written notice is given to CITY."

(iii) Other Insurance: "CONTRACTOR's insurance coverage shall be primary insurance as respects the City of Costa Mesa, its officers, officials, agents, employees, and volunteers. Any other insurance maintained by the City of Costa Mesa shall be excess and not contributing with the insurance provided by this policy."

(c) Reporting Provisions. Any failure of CONTRACTOR to comply with the reporting provisions of the policies shall not affect coverage provided to the City of Costa Mesa, its officers, officials, agents, employees, and volunteers.

(d) Insurance Applies Separately. CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

(e) Deductible or Self-Insured Retention. If any of such policies provide for a deductible or self-insured retention to provide such coverage, the amount of such deductible or self-insured retention shall be approved in advance by CITY. No policy of insurance issued as to which the CITY is an additional insured shall contain a provision which requires that no insured except the named insured can satisfy any such deductible or self-insured retention.

(f) Proof of Insurance. Prior to commencement of the Work, CONTRACTOR shall furnish CITY, through the Project Manager, proof of compliance with the above insurance requirements in a form satisfactory to City's Risk Management.

(g) Non-Limiting. Nothing in this Paragraph 21 shall be construed as limiting in any way, the indemnification provision contained in this Agreement, or the extent to which Consultant may be held responsible for payments of damages to persons or property.

22. PREVAILING WAGE REQUIREMENTS.

(a) Prevailing Wage Laws. CONTRACTOR is aware of the requirements of Chapter 1 (beginning at Section 1720 et seq.) of Part 7 of Division 2 of the California Labor Code, as well as Title 8, Section 16000 et seq. of the California Code of Regulations ("Prevailing Wage Laws"), which require the payment of prevailing wage rates and the performance of other requirements on "public works" and "maintenance" projects. This Project is a "public works" project and requires compliance with the Prevailing Wage Laws. CONTRACTOR shall defend, indemnify and hold the CITY, its elected officials, officers, employees and agents free and harmless from any claim or liability arising out of any failure or alleged failure to comply with the Prevailing Wage Laws.

(b) Payment of Prevailing Wages. CONTRACTOR shall pay the prevailing wage rates for all work performed under this Agreement. When any craft or classification is omitted from the general prevailing wage determinations, CONTRACTOR shall pay the wage rate of the craft or classification most closely related to the omitted classification. A copy of the general prevailing wage rate determination is on file in the Office of the City Clerk and is incorporated into this Agreement as if fully set forth herein. CONTRACTOR shall post a copy of such wage rates at all times at the project site(s).

(c) Legal Working Day. In accordance with the provisions of Labor Code Section 1810 et seq., eight (8) hours is the legal working day. CONTRACTOR and any subcontractor(s) of CONTRACTOR shall comply with the provisions of the Labor Code regarding eight (8)-hour work day and 40-hour work week requirements, and overtime, Saturday, Sunday, and holiday work. Work performed by CONTRACTOR's or any subcontractor's employees in excess of eight (8) hours per day, and 40 hours during any one week, must include compensation for all hours worked in excess of eight (8) hours per day, or 40 hours during any one week, at not less than one and one-half times the basic rate of pay. CONTRACTOR shall forfeit as a penalty to CITY Twenty-Five Dollars ($25.00), or any greater penalty set forth in the Labor Code, for each worker employed in

the execution of the Work by CONTRACTOR or by any subcontractor(s) of CONTRACTOR, for each calendar day during which such worker is required or permitted to the work more than eight (8) hours in one calendar day or more than 40 hours in any one calendar week in violation of the Labor Code.

(d) Apprentices. CONTRACTOR shall comply with the provisions of Labor Code Section 1777.5 concerning the employment of apprentices on public works projects. CONTRACTOR shall be responsible for ensuring compliance by its subcontractors with Labor Code Section 1777.5.

(e) Payroll Records. Pursuant to Labor Code Section 1776, CONTRACTOR and any subcontractor(s) shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by CONTRACTOR or any subcontractor in connection with this Agreement. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following: (1) The information contained in the payroll record is true and correct; and (2) The employer has complied with the requirements of Sections 1771, 1881, and 1815 of the Labor Code for any work performed by his or her employees on this Project. The payroll records shall be certified and shall be available for inspection at all reasonable hours in accordance with the requirements of Labor Code Section 1776. CONTRACTOR shall also furnish each week to CITY's Project Administration Division a statement with respect to the wages of each of its employees during the preceding weekly payroll period.

(f) Registration with California Department of Industrial Relations ("DIR"). CONTRACTOR and any subcontractor(s) of CONTRACTOR shall comply with the provisions of Labor Code Section 1771 and Labor Code Section 1725.5 requiring registration with the DIR.

23. COMPLIANCE WITH ALL LAWS.

CONTRACTOR shall, at its own cost and expense, comply with all applicable local, state, and federal laws, regulations, and requirements in the performance of this Agreement, including but not limited to laws regarding health and safety, labor and employment, and wage and hours.

24. DRUG-FREE WORKPLACE POLICY.

CONTRACTOR, upon notification of the award of this Agreement, shall establish a Drug-Free Awareness Program to inform employees of the dangers of drug abuse in the workplace, the penalties that may be imposed upon employees for drug abuse violations occurring in the workplace, and the employee assistance programs available to employees. Each employee engaged in the performance of a CITY contract must be notified of this Drug-Free Awareness Program, and must abide by its terms. CONTRACTOR shall conform to all the requirements of CITY's Policy No. 100-5,

attached hereto in Exhibit D. Failure to establish a program, notify employees, or inform the CITY of a drug-related workplace conviction will constitute a material breach of contract and cause for immediate termination of the contract by the CITY.

25. NON–DISCRIMINATION.

In performing this Agreement, CONTRACTOR will not engage in, nor permit its agents to engage in, discrimination in employment of persons because of their race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status or sex, or sexual orientation, except as permitted pursuant to Section 12940 of the Government Code. Violation of this provision may result in the imposition of penalties referred to in Section 1735 of the California Labor Code.

26. PROVISIONS CUMULATIVE.

The provisions of this Agreement are cumulative and in addition to, and not in limitation of, any other rights or remedies available to CITY.

27. NOTICES.

It shall be the duty and responsibility of CONTRACTOR to notify all tiers of subcontractors and material men of the following special notice provision; namely, all preliminary 20-day notices or stop notices shall be directed only to the City Clerk and to no other department, and shall be either personally delivered or sent by certified mail, postage prepaid.

All other notices shall be in writing and delivered in person or sent by certified mail, postage prepaid. Notices required to be given to CITY pursuant to this Agreement shall be addressed as follows:

City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92626
Attn: Seung Yang and Robert Ryan

Notices required to be given to CONTRACTOR shall be addressed as follows:

RMF Consulting, Inc.
1523 North Harmony Circle
Anaheim, CA 92807
Attn: Tom Taggart

Notices required to be given to CONTRACTOR's sureties shall be addressed as follows:

Markel Insurance Company
10 Parkway North, Suite 100

Deerfield, IL 60015
Attn: Adriana Valenzuela

28. INDEPENDENT CONTRACTOR.

The parties hereto acknowledge and agree that the relationship between CITY and CONTRACTOR is one of principal and independent contractor and no other. All personnel to be utilized by CONTRACTOR in the performance of this Agreement shall be employees of CONTRACTOR and not employees of the CITY. CONTRACTOR shall pay all salaries and wages, employer's social security taxes, unemployment insurance and similar taxes relating to employees and shall be responsible for all applicable withholding taxes. Nothing contained in this Agreement shall create or be construed as creating a partnership, joint venture, employment relations, or any other relationship except as set forth between the parties. The parties specifically acknowledge and agree that CONTRACTOR is not a partner with CITY, whether general or limited, and no activities of CITY or CONTRACTOR or statements made by CITY or CONTRACTOR shall be interpreted by any of the parties hereto as establishing any type of business relationship other than an independent contractor relationship.

29. PERS ELIGIBILITY INDEMNIFICATION.

In the event that CONTRACTOR or any employee, agent, or subcontractor of CONTRACTOR providing services under this Agreement claims or is determined by a court of competent jurisdiction or the California Public Employees' Retirement System (PERS) to be eligible for enrollment in PERS as an employee of the CITY, CONTRACTOR shall indemnify, defend, and hold harmless CITY for the payment of any employee and/or employer contributions for PERS benefits on behalf of CONTRACTOR or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of CITY.

Notwithstanding any other agency, state or federal policy, rule, regulation, law or ordinance to the contrary, CONTRACTOR and any of its employees, agents, and subcontractors providing service under this Agreement shall not qualify for or become entitled to, and hereby agree to waive any claims to, any compensation, benefit, or any incident of employment by CITY, including but not limited to eligibility to enroll in PERS as an employee of CITY and entitlement to any contribution to be paid by CITY for employer contribution and/or employee contributions for PERS benefits.

30. VALIDITY.

The invalidity in whole or in part of any provision of this Agreement shall not void or affect the validity of any of the other provisions of this Agreement.

31. GOVERNING LAW.

This Agreement shall be governed by and construed in accordance with the laws of the State of California. Any legal action relating to or arising out of this Agreement shall

be subject to the jurisdiction of the County of Orange, California.

32. NO THIRD PARTY BENEFICIARY RIGHTS.

This Agreement is entered into for the sole benefit of the CITY and CONTRACTOR and no other parties are intended to be direct or incidental beneficiaries of this Agreement and no third party shall have any right in, under or to this Agreement.

33. ASSIGNABILITY.

This Agreement may not be transferred or assigned by either party, or by operation of law, to any other person or persons or business entity, without the other party's written permission. Any such transfer or assignment, or attempted transfer or assignment, without written permission, may be deemed by the other party to constitute a voluntary termination of this Agreement and this Agreement shall thereafter be deemed terminated and void.

34. WAIVER.

No waiver of any provision of this Agreement shall be effective unless in writing and signed by a duly authorized representative of the party against whom enforcement of a waiver is sought referring expressly to this Paragraph. The waiver of any right or remedy in respect to any occurrence or event shall not be deemed a waiver of any right or remedy in respect to any other occurrence or event, nor shall any waiver constitute a continuing waiver.

35. HEADINGS.

Section and subsection headings are not to be considered part of this Agreement, are included solely for convenience, and are not intended to modify or explain or to be a full or accurate description of the content thereof.

36. CONSTRUCTION.

The parties have participated jointly in the negotiation and drafting of this Agreement and have had an adequate opportunity to review each and every provision of the Agreement and submit the same to counsel or other consultants for review and comment. In the event an ambiguity or question of intent or interpretation arises with respect to this Agreement, this Agreement shall be construed as if drafted jointly by the parties and in accordance with its fair meaning. There shall be no presumption or burden of proof favoring or disfavoring any party by virtue of the authorship of any of the provisions of this Agreement.

37. COUNTERPARTS.

This Agreement may be executed in one or more counterparts by the parties

hereto. All counterparts shall be construed together and shall constitute one Agreement.

38. CORPORATE AUTHORITY.

The persons executing this Agreement on behalf of the parties hereto warrant that they are duly authorized to execute this Agreement on behalf of said parties and that by doing so, the parties hereto are formally bound to the provisions of this Agreement.

[Signatures appear on following page.]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by and through their respective authorized officers, as of the date first above written.

CITY OF COSTA MESA,
A municipal corporation

_____ Date: _____
Lori Ann Farrell Harrison
City Manager

CONTRACTOR

_____ Date: _____
Signature

_____
Name and Title

ATTEST:

_____ Date: _____
Brenda Green
City Clerk

APPROVED AS TO FORM:

_____ Date: _____
Kimberly Hall Barlow
City Attorney

APPROVED AS TO INSURANCE:

_____ Date: _____
Ruth Wang
Risk Management

APPROVED AS TO PURCHASING:

_____ Date: _____
Carol Molina
Finance Director

DEPARTMENTAL APPROVAL:

_____ Date: _____
Raja Sethuraman
Public Works Director

_____ Date: _____
Seung Yang
Project Manager

EXHIBIT A

CONTRACTOR'S BID

PROPOSAL
FOR THE
LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

The Honorable City Council
City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92626

Dear Council Members:

In compliance with the NOTICE INVITING BIDS FOR THE **LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09,** a copy which is hereto attached, the undersigned has carefully examined the location of the proposed Work, the Plans, Specifications and other Contract Documents and is therefore satisfied as to the conditions to be encountered, as to the character, quality and quantity of work to be performed and materials to be furnished and as to the requirements of the specifications and the Contract. It is mutually agreed that the submission of a proposal shall be considered prima facie evidence that the BIDDER has made such examination.

If awarded the Contract, the undersigned agrees to commence the Work under the Contract **WITHIN TEN (10) WORKING DAYS AFTER DATE OF CONTRACT, AND COMPLETE SAID WORK WITHIN FORTY (40) WORKING DAYS** from the first day of commencement of such work unless legal extension is granted in accordance with the terms set forth in the specifications, and to perform and complete the Work as shown on the Plans and in accordance with the Specifications and other Contract Documents, and to furnish all labor, materials, tools and equipment necessary to complete the Work in-place therefor, in the manner and time herein prescribed at the following prices, to wit:

BID SCHEDULE PROPOSAL

ITEM #	BID ITEM DECRIPTION	QTY.	UNIT	UNIT PRICE (in figures)	ITEMS TOTAL (in figures)
LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES:					
1	All Labor, Parts, Materials, Equipment, Deliveries, Setup, Mobilization, etc., to Fully Install and Operate City-Furnished Light-Emitting Diode (LED) Lights at the Following City Parks and Athletic Facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex	1	L.S.	759,700.00	759,700.00

TOTAL BID PROPOSAL FIGURES: $ 759,700.00

TOTAL BID PROPOSAL (Words):

Seven Hundred Fifty-Nine Thousand, Seven Hundred Dollars and Zero Cents

The award of the Contract shall be based on the lowest responsive Bid amount, and the City reserves the right to delete one or more bid items and/or to increase and/or to decrease bid items' quantities.

The CITY also reserves the right to reject all Bids.

MF
Bidder's Initials

PROPOSAL BID SCHEDULE (CONTINUED)

NOTES:

1. The accuracy of estimate quantities as shown is not guaranteed; the Bidder shall make his/her own estimate from the drawings and field review for verification. If the unit price and the total amount are different, the unit price will control the bid. Payment shall be based on actual work done and/or actual quantities used.

2. The City reserves the right to delete one or more bid items and/or to increase or decrease bid items' quantities, at no additional cost to the City.

3. FA designates force account. Payment shall be made on a time and materials basis, only if directed by the ENGINEER.

4. (F) Designates Final Pay Item. When an item of work is designated as "FINAL PAY ITEM" in the Specifications, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

   The estimated quantity for each item of work designated as "FINAL PAY ITEM" in the Specifications, shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.

   In case of discrepancy between the quantity shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown in the Engineer's Estimate.

5. Bidder declares that it has read and understands Items 14 & 15 of Information for Bidders (Page B-2 and B-3).

6. Bidder agrees to initial or notarize (if applicable) all pages on P-1, P-1a, P-1b, P1-c, and through P-11 uploaded onto *PlanetBids*.

MF
Bidder's Initials

PROPOSAL SCHEDULE
(CONTINUED)

(Please Type or Print)

Total Amount for Base Bid (in written words) Seven Hundred Fifty-Nine Thousand, Seven Hundred Dollars and Zero Cents

($ 759,700.00)
in figures

Contractor's Lawful Name: RMF Contracting Inc. dba R&M Electrical Contracting

Bidder's Name: MaryAnn Feilmeier Bidder's Initials: MF

Contractor's License No. 813655 Expiration: 10/31/2024

Contractor's Taxpayer I.D. Number: 33-0990428

Contractor's DIR Registration Number: 1000003540

Signature: [signature] Date: 11/13/2023

Contractor's Address: 1523 N Harmony Circle, Anaheim, CA 92807

Telephone Number: (949) 770-2269 Mobile No.: (949)230-1279

Fax Number: (949) 770-4221 E-mail: heather@r-melectrical.com

24-Hour Emergency Contacts:

Richard Feilmeier
Name
Telephone Number: (949) 770-2269
Mobile No.: (949) 230-1279

Timothy Hess
Name
Telephone No.: (949) 770-2269
Mobile No.: (949) 230-2179

Heather Brown
Name
Telephone No.: (949) 770-2269
Mobile No.: (949) 374-0972

MF
Bidder's Initials

PROPOSAL SCHEDULE
(CONTINUED)

The Contractor agrees that the City will not be held responsible if any of the approximate quantities shown in the foregoing proposal shall be found incorrect, and he shall not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission or misstatements shall be discovered in the estimated quantities, it shall not invalidate this contract or release the Contractor from the execution and completion of the whole or part of the work herein specified, in accordance with the specifications and the plans herein mentioned and the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation otherwise than as provided for in this contract.

The Contractor agrees that the City shall have the right to increase or decrease the quantity of any bid item or portion of the work or to omit portions of the work as may be deemed necessary or expedient, and that the payment for incidental items or work, not separately provided in the proposal shall be considered included in the price bid for other various items or work.

Accompanying this proposal is "Cash," "Certified Check," or "Bidder's Bond" (circle one) in the amount of Ten Percent of Amount Bid ($ 10%) equal to at least ten (10%) percent of the total bid price, payable to the City of Costa Mesa, to guarantee that within fourteen (14) days after written notice is deposited in the mail, or the bidder has received notice by telephone, the bidder will furnish proper Certificates of Insurance, and required bonds satisfactory to the City and execute a contract in accordance with the proposal and in the manner and form required by the contract documents.

The undersigned deposits the above-named security as a proposal guarantee and agrees that it shall be forfeited to the City of Costa Mesa as Liquidated Damages if the above requirements are not complied with.

MF

Bidder's Initials

Project and Specification No. 23-09

Respectfully Submitted,

RMF Contracting Inc. dba R&M Electrical Contracting	Richard Feilmeier — President
Contractor's Business Name	Contractor — Title
1523 N. Harmony Circle	Secretary
Business Address: Street	Singed By — Title
Anaheim CA 92807	813655 C-10, A — 10/31/2024
City State Zip	Contractor's License No. and Classification — Exp. Date
949-770-2269	11/13/2023
Business Phone Number	Date
MaryAnn Feilmeier Secretary	21321 Bishop
Name Title	Residence: Street
Mission Viejo CA 92692	949-770-0759
City State Zip	Residence phone Number

If the bid is by a corporation, state the names of the officers who can sign an agreement on behalf of the corporation and whether more than one officer must sign.

☒ Corporation Taxpayer I.D. Number: 33-0990428

	Can Sign	Must Sign
Name Richard Feilmeier - President	☒	☐
Name MaryAnn Feilemeier - Secretary	☒	☐
Name	☐	☐

If the bid is by a partnership or a joint venture, state the names and addresses of all general partners and joint ventures.

☐ Partnership or Joint Ventures Taxpayer I.D. Number: _____

Name _____

Address _____

Name n/a

Address _____

If the bidder is a sole proprietorship or another entity that does business under a fictitious name, the bid shall be in the real name of the bidder with a designation following showing "DBA (the fictitious name)"; provided, however, no fictitious name shall be used unless there is a current registration with the Orange County Recorder.

The full names and residences of all persons and parties interested in the foregoing proposal, as principals, are as follows:

NOTE: Give first and last names in full; in case of corporation, give names of President, Secretary, Treasurer and Manager, and affix corporate seal; in case of partnerships and joint ventures, give names of all the individual members.

n/a

Bidder's Initials

Bidder shall signify receipt of all Addenda here, if any:

Addendum No.	Date Received	Bidder's Signature
1	11/7/2023	
2	11/8/2023	

CONSTRUCTION PROJECT REFERENCES

In order to more fully evaluate your firm's background and experience for the project herein proposed, it is requested that you submit a list of Public Works and/or similar construction projects completed, or in progress, within the last 24 months. This information will be used to evaluate whether the bid is responsive and or responsible to the call for bids.

Date Project Awarded	Awarding Agency	Agency's Contract Administrator Contact Information
7/6/2023	City of Whittier Murphy Ranch Little League BB Field Lighting	Alfredo Hernandez PH 562-567-9512
6/14/2023	City of Temecula Ronald Reagan Sports Park	Stacy Fox PH 951-308-6306
5/19/2023	Golden West College District Golden West College Soccer Retrofit	Danny Johnson PH 714-895-8344
3/21/2023	City of Santa Ana Santa Ana Stadium	Arne Cvek PH 714-310-0638
2/24/2023	San Bernardino City USD San Gorgonio HS	Bryan Hartman PH 951-206-4830
2/15/2023	University of CA Irvine Cicerone Field / Anteater Park	David Hooks PH 949-422-0539
3/21/2023	City of Santa Ana Dan Young, Thornton & Memorial Park	Arne Cvek PH 714-310-0638
12/9/2022	City of Huntington Beach Huntington Beach Sports Park PH 2	Chris Cole PH 714-536-5265
10/4/2022	City of Santa Clarita Central Park Buildout	Terry Brice PH 661-510-2018
9/6/2022	City of San Clemente Steed Sports Park	Randy Little PH 949-899-1223
8/1/2022	City of Mission Viejo Marty Russo Park	Jerry Hill PH 949-470-3085
6/17/2022	Norwalk La Mirada USD La Mirada HS New Football Stadium	Ralph Shryock PH 562-884-5840
6/16/2022	City of Santa Ana Santa Anita Park Impr.	Arne Cvek PH 714-310-0638
6/6/2022	City of Carson Calas Park	Modesto Balanos PH 310- 847-3519
4/1/2022	Golden West College District Golden West College Pool	Danny Johnson PH 714-895-8344

MF
Bidder's Initials

Project and Specification No. 23-09

DESIGNATION OF SUBCONTRACTORS

In compliance with the "Subletting and Subcontracting Fair Practices Act" being Sections 4100-4113 of the Public Contract Code of the State of California, and any amendments thereto, each bidder shall set forth below the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement in an amount in excess of one-half (½) of one percent (1%) of the prime contractor's total bid or in the case of bids for the construction of streets or highways, including bridges, in excess of one-half (½) of one percent (1%) of the prime contractor's total bid or ten thousand ($10,000) dollars, whichever is greater. Bidder shall further set forth the portion of the work, which will be done by each such subcontractor with its Department of Industrial Relations (DIR) registration number. Only one subcontractor for each such portion shall be listed.

If the contractor fails to specify a subcontractor for any portion of the work to be performed under the contract, he/she/it shall be deemed to have agreed to perform the balance of all work, which is not covered, and he/she/it shall not be permitted to subcontract that portion of the work except under the conditions hereinafter set forth.

Subletting or subcontracting of any portion of the work to which no subcontractor was designated in the original bid, shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the Legislative Body of the Owner.

All information must be filled out and typed. Please use additional pages in this format if needed.

Bid Item (s) Number	*% Portion of Work*	*Name, Address and E-mail of Subcontractor*	*State License Number*	*Class*	*DIR Registration Number*

No Subs

By submission of this proposal, the Bidder certifies:

1. That (I)(we)(it) is able to and will perform the balance of all work which is not covered in the above subcontractors listing.
2. That the AGENCY will be furnished copies of all subcontracts entered into by subcontractor for this project.

MF
Bidder's Initials

CONTRACT ASSURANCE

The CONTRACTOR or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The CONTRACTOR shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the CONTRACTOR to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as recipient deems appropriate.

The CONTRACTOR will require that the above provision is included in all subcontracts.

MF

Bidder's Initials

NONCOLLUSION AFFIDAVIT

The bidders, by its officers and agents or representatives present at the time of filing this bid, being duly sworn on their oaths say, that neither they nor any of them have in any way directly or indirectly entered into any arrangement or agreement with any other bidder, or with any public officer of such CITY OF COSTA MESA whereby such affiant or affiants or either of them has paid or l s to pay to such bidder or public officer any sum of money, or has given or is to give to such other bidder or public officer anything of value whatever, or such affiant or affiants or either of them has not directly or indirectly, entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in the letting of the contract sought for on the attached bids; that no bid has been accepted from any subcontractor or supplier through any bid depository, the By-Laws, Rules, or Regulations of which prohibit or prevent the Contractor from considering any bid from any subcontractor or supplier which is not processed through said bid depository, or which prevent any subcontractor or supplier from bidding to any Contractor who does not use the facilities or accept bids from or through such bid depository; that bidder has not bid as subcontractor to other bidders; that no inducement of any form or character other than that which appears upon the face of the bid will be suggested, offered, paid or delivered to any person of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contracts sought by this bid.

RMF Contracting Inc. dba R&M Electrical Contracting

Contractor Firm Name

MaryAnn Feilmeier

Name of Principal

Secretary

Title

Signature

Subscribed and sworn to before me by:

See attached

This ____ day of _____, 20___.

My Commission Expires: _____

Notary Public

MF

Bidder's Initials

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Orange

Subscribed and sworn to (or affirmed) before me on this 13th day of November, 2023, by MaryAnn Feilmeier,
proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me.

HEATHER JOY BROWN
Notary Public - California
Orange County
Commission # 2356479
My Comm. Expires May 4, 2025

(Seal)

Signature Heather Joy Brown

CONTRACTOR'S CERTIFICATION
OF
WORKERS' COMPENSATION INSURANCE REQUIREMENTS
FOR
PUBLIC WORKS PROJECTS
(Labor Code §1861)

I am aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract.

Dated: 11/13/2023

CONTRACTOR

Mary Ann Feilmeier

RMF Contracting Inc. dba R&M Electrical Contracting

Company Name

PROJECT: LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

MF

Bidder's Initials

DRUG-FREE WORKPLACE POLICY

CONTRACTOR, upon notification of contract award, shall establish a Drug-Free Awareness Program to inform employees of the dangers of drug abuse in the workplace, the penalties that may be imposed upon employees for drug abuse violations occurring in the workplace, and the employee assistance programs available to employees. Each employee engaged in the performance of a CITY contract must be notified of this Drug-Free Awareness Program, and must abide by its terms. Failure to establish a program, notify employees, or inform CITY of a drug-related workplace conviction will constitute a material breach of contract and cause for immediate termination of the contract by CITY.

CONTRACTOR shall conform to all the requirements of CITY'S Policy No. 100-5. A copy of this policy is attached to the sample contract agreement as an attachment in the Project Specifications.

MF

Bidder's Initials

Project and Specification No. 23-09

BIDDER/APPLICANT/CONTRACTOR CAMPAIGN

CONTRIBUTION DISCLOSURE FORM

Proposer/Consultant/Applicant is required to identify any campaign contribution or cumulative contributions greater than $249 to any city council member in the twelve months prior to submitting an application, proposal, statement of qualifications or bid requiring approval by the City Council.

Date	Name of Donor	Company/Business Affiliation	Name of Recipient	Amount
		n/a		

Except as described above, I/we have not made any campaign contribution in the amount of $250 or more to any Costa Mesa City Council Member in the twelve months preceding this Application/Proposal.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

MaryAnn Feilmeier

Bidder/Applicant/Proposer RMF Contracting Inc. dba R&M Electrical Contracting

11/13/2023

Date

MF

Bidder's Initials

CITY OF COSTA MESA

P.O. BOX 12000 77 FAIR DRIVE CALIFORNIA 92628·1200

FROM THE PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION

DATE: NOVEMBER 7, 2023

TO: ALL PROSPECTIVE BIDDERS

SUBJECT: ADDENDUM NO. 1 –
LED LIGHTING AT CITY PARKS AND ATHLETIC FACILITIES PROJECT,
CITY PROJECT NO. 23-09

Please forward this addendum to the appropriate individual as soon as possible. To assist our office in confirming the delivery of this addendum, please sign acknowledging receipt herein and e-mail a copy of this sheet to janet.zuazo@costamesaca.gov. **A COPY WILL NOT BE SENT BY MAIL.**

Received by: Tom Thomas

Company: RMF CONTRACTING, INC

All bidders shall register with PlanetBids.com in order to retrieve addenda. It is the responsibility of each prospective bidder to check the City's PlanetBids.com portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476 on a DAILY basis through the close of bids for any applicable addenda or updates.

This addendum, effective on this date, addresses the following items:

The following **SHALL** be amended to the *Notice to Bidders, Proposal, Contract, and Special Provisions* (i.e., bid project documents):

- Change of Bid Opening date and time: On page N-1 in the NOTICE INVITING BIDS, under **BID SUBMISSION AND OPENING**, the first sentence, Point #1, shall now read: *"Bids must be submitted electronically via the City of Costa Mesa's PlanetBids portal before the deadline of **3:00 P.M., Monday, November 13, 2023**, at which time or shortly thereafter the City Clerk will open bids electronically."*

The following shall serve as a REMINDER of the following, as noted on page N-1 in the NOTICE INVITING BIDS, Point #5, **BID SECURITY:**

- Each bidder must submit an **original** certified check, cashier's check, or a bid bond, made payable to or in favor of the City of Costa Mesa, in an amount equal to at least ten percent (10%) of the total amount of the bid, **to the Costa Mesa City Clerk prior to the bid submission deadline**. No bid will be considered unless such certified check, cashier's check, or bid bond was received by the City Clerk prior to the bid submission deadline. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

The following are additional documents / plans related to the *Jack Hammett Sports Complex* LED lighting.

- See attached.

CITY OF COSTA MESA

P.O. BOX 12000 77 FAIR DRIVE CALIFORNIA 92628·1200

FROM THE PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION

DATE: NOVEMBER 8, 2023

TO: ALL PROSPECTIVE BIDDERS

SUBJECT: ADDENDUM NO. 2 –
LED LIGHTING AT CITY PARKS AND ATHLETIC FACILITIES PROJECT,
CITY PROJECT NO. 23-09

Please forward this addendum to the appropriate individual as soon as possible. To assist our office in confirming the delivery of this addendum, please sign acknowledging receipt herein and e-mail a copy of this sheet to janet.zuazo@costamesaca.gov. **A COPY WILL NOT BE SENT BY MAIL.**

Received by: Tom Tsunt

Company: RMF CONTRACTING, INC

All bidders shall register with PlanetBids.com in order to retrieve addenda. It is the responsibility of each prospective bidder to check the City's PlanetBids.com portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476 on a DAILY basis through the close of bids for any applicable addenda or updates.

This addendum, effective on this date, addresses the following items:

The following are additional documents / plans related to the *Jack Hammett Sports Complex* LED lighting –

- TeWinkle Tennis Center pole foundation structural calculations (see attached, starting on page 3).
- Bill of Materials for the following:
  - Jack Hammett Sports Complex (see attached, starting on page 28)
  - TeWinkle Bark Park (see attached, starting on page 29)
  - TeWinkle Baseball Field (see attached, starting on page 30)
  - TeWinkle Tennis Center (see attached, starting on page 31)

EXHIBIT B

BID PACKET

CITY OF COSTA MESA
ORANGE COUNTY, CALIFORNIA
NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that the City of Costa Mesa ("City") invites sealed bids, to be submitted electronically only, for the following project:

LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

1. **BID SUBMISSION AND OPENING:** Bids must be submitted electronically via the City of Costa Mesa's PlanetBids portal before the deadline of **3:00 P.M., Thursday, November 9, 2023**, at which time or shortly thereafter the City Clerk will open bids electronically. The bid results will be posted online via PlanetBids. No paper bids or any other form of submittal will be accepted. Any bid received after the scheduled closing time for the receipt of bids will be rejected. The City is not responsible for and accepts no liability in the event a response is late due to any network, internet, or any other technical difficulty or interruption. It shall be the sole responsibility of the bidder to ensure that his/her/its bid is received by the deadline.

   To access the bid documents and bid on this project, potential vendors and bidders must first register through the City's PlanetBids portal at: *https://www.planetbids.com/portal/portal.cfm?CompanyID=45476*.

2. **SCOPE OF WORK AND BID DOCUMENTS:** The scope of work generally consists of all labor, parts, materials, equipment, deliveries, setup, mobilization, etc., to fully install and operate City-furnished light-emitting diode (LED) lights at the following City parks and athletic facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex.

   The plans, specifications, and bid documents for this project can be obtained via the City's PlanetBids portal at: *https://www.planetbids.com/portal/portal.cfm?CompanyID=45476*.

   It is the bidder's responsibility to ensure that the most current version of the solicitation, including any addenda, has been downloaded. Bids received without the applicable addenda will be rejected as incomplete.

3. **PRE-BID MEETING OR JOB WALK:** NONE.

4. **BID CONTENTS:** All bids must be submitted on the proposal form included in the bid documents. No bid will be considered unless it is made on the proposal form furnished by the City and made in accordance with the provisions of the bid requirements.

5. **BID SECURITY:** Each bidder must submit an **original** certified check, cashier's check, or a bid bond, made payable to or in favor of the City of Costa Mesa, in an amount equal to at least ten percent (10%) of the total amount of the bid, to the Costa Mesa City Clerk prior to the bid submission deadline. No bid will be considered unless such certified check, cashier's check, or bid bond was received by the City Clerk prior to the bid submission deadline. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

6. **CONTRACTOR'S LICENSE:** A valid **California Contractor's License Class "A" (General Engineering Contractor)** issued by the California Contractors State License Board is required at the time the contract is awarded pursuant to California Public Contract Code section 3300. Each bidder must also be qualified as required by law at the time of the bid opening.

7. **PREVAILING WAGES:** This project is a "public work" subject to prevailing wage requirements. Pursuant to provisions of Sections 1770 et seq. of the California Labor Code, all works employed on the project shall be paid not less than the general prevailing rate of per diem wages, as determined by the Director of the Department of Industrial Relations (DIR) for work of a similar character in the locality in which the work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work. Copies of the prevailing rate of per diem wages are on file with Costa Mesa Public Services Department and are available to any interested party upon request. The applicable State prevailing wages are also set forth on the Department of Industrial Relations' website: http://www.dir.ca.gov; these rates are subject to predetermined increases. The prime contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This project is subject to compliance monitoring and enforcement by the DIR.

8. **PAYMENT BOND AND PERFORMANCE BOND:** A Payment Bond and a Performance Bond, each in the amount of 100% of the contract amount, will be required of the successful bidder prior to award of the contract.

9. **NON-DISCRIMINATION:** The bidding process and contract are subject to State and Federal non-discrimination requirements, including but not limited to the requirement that no person or business shall discriminate on the basis of race, color, national origin, ancestry, religious creed, physical disability, mental disability, medical condition, marital status, sex, gender, gender expression, gender identity, sexual orientation, age, or military or veteran status in its solicitation, selection, hiring, or treatment of individuals or businesses in connection with the bidding process or work performed for the City in connection with the project.

10. **ADDITIONAL REQUIREMENTS:** This project is subject to local, State, and Federal regulations and requirements, as detailed in the bid documents.

For all inquiries, please contact **Rob Ryan**, Maintenance Services Manager, Public Works Department, via e-mail at *robert.ryan@costamesaca.gov*.

Brenda Green, City Clerk
City of Costa Mesa
Dated: October 5, 2023

Los Angeles Times
MEDIA GROUP

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA
County of Orange

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the action for which the attached notice was published. I am a principal clerk of the Newport Harbor News Press Combined With Daily Pilot, which was adjudged a newspaper of general circulation on June 19, 1952, Cases A24831 for the City of Newport Beach, County of Orange, and State of California. Attached to this Affidavit is a true and complete copy as was printed and published on the following date(s):
Oct 05, 2023

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Fountain Valley, California
on this 12th day of October, 2023.

Wendy Cooper
[signature]

10540 Talbert Avenue
Fountain Valley, CA 92708

Los Angeles Times
MEDIA GROUP

Sold To:
Costa Mesa Public Services Department – CA91073802
77 Fair Drive 4th Floor
Costa Mesa, CA 92626

Bill To:
Costa Mesa Public Services Department – CA91073802
77 Fair Drive 4th Floor
Costa Mesa, CA 92626

City of Costa Mesa
Orange County, California
Notice Inviting Bids

NOTICE IS HEREBY GIVEN that the City of Costa Mesa ("City") invites sealed bids, to be submitted electronically only, for the following project:

LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

1. **BID SUBMISSION AND OPENING**: Bids must be submitted electronically via the City of Costa Mesa's PlanetBids portal before the deadline of **3:00 P.M., Thursday, November 9, 2023**, at which time or shortly thereafter the City Clerk will open bids electronically. The bid results will be posted online via PlanetBids. No paper bids or any other form of submittal will be accepted. Any bid received after the scheduled closing time for the receipt of bids will be rejected. The City is not responsible for and accepts no liability in the event a response is late due to any network, internet, or any other technical difficulty or interruption. It shall be the sole responsibility of the bidder to ensure that his/her/its bid is received by the deadline.

   To access the bid documents and bid on this project, potential vendors and bidders must first register through the City's PlanetBids portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476.

2. **SCOPE OF WORK AND BID DOCUMENTS**: The scope of work generally consists of all labor, parts, materials, equipment, deliveries, setup, mobilization, etc., to fully install and operate City-furnished light-emitting diode (LED) lights at the following City parks and athletic facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex.

   The plans, specifications, and bid documents for this project can be obtained via the City's PlanetBids portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476.

   It is the bidder's responsibility to ensure that the most current version of the solicitation, including any addenda, has been downloaded. Bids received without the applicable addenda will be rejected as incomplete.

3. **PRE-BID MEETING OR JOB WALK**: NONE.

4. **BID CONTENTS**: All bids must be submitted on the proposal form included in the bid documents. No bid will be considered unless it is made on the proposal form furnished by the City and made in accordance with the provisions of the bid requirements.

5. **BID SECURITY**: Each bidder must submit an **original** certified check, cashier's check, or a bid bond, made payable to or in favor of the City of Costa Mesa, in an amount equal to at least ten percent (10%) of the total amount of the bid, to the Costa Mesa City Clerk prior to the bid submission deadline. No bid will be considered unless such certified check, cashier's check, or bid bond was received by the City Clerk prior to the bid submission deadline. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

6. **CONTRACTOR'S LICENSE**: A valid **California Contractor's License Class "A" (General Engineering Contractor)** issued by the California Contractors State License Board is required at the time the contract is awarded pursuant to California Public Contract Code section 3300. Each bidder must also be qualified as required by law at the time of the bid opening.

7. **PREVAILING WAGES:** This project is a "public work" subject to prevailing wage requirements. Pursuant to provisions of Sections 1770 et seq. of the California Labor Code, all works employed on the project shall be paid not less than the general prevailing rate of per diem wages, as determined by the Director of the Department of Industrial Relations (DIR) for work of a similar character in the locality in which the work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work. Copies of the prevailing rate of per diem wages are on file with Costa Mesa Public Services Department and are available to any interested party upon request. The applicable State prevailing wages are also set forth on the Department of Industrial Relations' website: http://www.dir.ca.gov; these rates are subject to predetermined increases. The prime contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This project is subject to compliance monitoring and enforcement by the DIR.

8. **PAYMENT BOND AND PERFORMANCE BOND**: A Payment Bond and a Performance Bond, each in the amount of 100% of the contract amount, will be required of the successful bidder prior to award of the contract.

9. **NON-DISCRIMINATION:** The bidding process and contract are subject to State and Federal non-discrimination requirements, including but not limited to the requirement that no person or business shall discriminate on the basis of race, color, national origin, ancestry, religious creed, physical disability, mental disability, medical condition, marital status, sex, gender, gender expression, gender identity, sexual orientation, age, or military or veteran status in its solicitation, selection, hiring, or treatment of individuals or businesses in connection with the bidding process or work performed for the City in connection with the project.

10. **ADDITIONAL REQUIREMENTS**: This project is subject to local, State, and Federal regulations and requirements, as detailed in the bid documents.

For all inquiries, please contact **Rob Ryan**, Maintenance Services Manager, Public Works Department, via e-mail at robert.ryan@costamesaca.gov.

Brenda Green, City Clerk
City of Costa Mesa
Dated: October 5, 2023

CITY OF COSTA MESA

P.O. BOX 12000 77 FAIR DRIVE CALIFORNIA 92628·1200

FROM THE PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION

DATE: **NOVEMBER 7, 2023**

TO: **ALL PROSPECTIVE BIDDERS**

SUBJECT: **ADDENDUM NO. 1 –**
LED LIGHTING AT CITY PARKS AND ATHLETIC FACILITIES PROJECT,
CITY PROJECT NO. 23-09

Please forward this addendum to the appropriate individual as soon as possible. To assist our office in confirming the delivery of this addendum, please sign acknowledging receipt herein and e-mail a copy of this sheet to janet.zuazo@costamesaca.gov. **A COPY WILL NOT BE SENT BY MAIL.**

Received by: _____

Company: _____

All bidders shall register with PlanetBids.com in order to retrieve addenda. It is the responsibility of each prospective bidder to check the City's PlanetBids.com portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476 on a DAILY basis through the close of bids for any applicable addenda or updates.

This addendum, effective on this date, addresses the following items:

The following **SHALL** be amended to the *Notice to Bidders, Proposal, Contract, and Special Provisions* (i.e., bid project documents):

- Change of Bid Opening date and time: On page N-1 in the NOTICE INVITING BIDS, under **BID SUBMISSION AND OPENING**, the first sentence, Point #1, shall now read: *"Bids must be submitted electronically via the City of Costa Mesa's PlanetBids portal before the deadline of **3:00 P.M., Monday, November 13, 2023**, at which time or shortly thereafter the City Clerk will open bids electronically."*

The following shall serve as a REMINDER of the following, as noted on page N-1 in the NOTICE INVITING BIDS, Point #5, **BID SECURITY:**

- Each bidder must submit an **original** certified check, cashier's check, or a bid bond, made payable to or in favor of the City of Costa Mesa, in an amount equal to at least ten percent (10%) of the total amount of the bid, **to the Costa Mesa City Clerk prior to the bid submission deadline**. No bid will be considered unless such certified check, cashier's check, or bid bond was received by the City Clerk prior to the bid submission deadline. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

The following are additional documents / plans related to the *Jack Hammett Sports Complex* LED lighting.

- See attached.

The following are Question and Answer (Q&A) responses to bidder questions:

1. **Question:** On this project for one of the sites (Tewinkle Park tennis) scope of work is to install new poles, is the contractor responsible for providing the poles or will Musco be providing the poles? Please clarify.

   Answer: Yes, Musco will be providing the poles.

2. **Question:** Are the existing poles and foundations to be demolished and disposed of? If so, please specify quantity and if demolition of existing foundations 2' below grade will be acceptable.

   Answer: Yes, existing poles will need to be demolished and disposed of. Musco will be providing a new pre-cast pier footing foundation with new poles. The design will be based on standard soil conditions.

3. **Question:** Please provide geotechnical report and foundation design for the new poles.

   Answer: None available.

4. **Question:** Is the existing underground conduit and wiring to be reused for new poles? If so, please provide electrical infrastructure as-builts. If new electrical infrastructure is required does the prime contractor need to board electrical engineering?

   Answer: The existing underground conduit and wiring is to be used.

5. **Question:** Is the existing switchgear and service to be reused?

   Answer: The existing switchgear and service is to be reused.

6. **Question:** Will tennis court resurfacing be required?

   Answer: Yes, the contractor shall be responsible for repairing and surfacing that gets damaged.

The contents of this bid addendum shall have precedence over all related provisions within the contract documents. It is the intent of the City of Costa Mesa to clarify the above-referenced items to all bidders. Should it be necessary to request clarification on these matters, please send your request via e-mail at *janet.zuazo@costamesaca.gov*.

Please acknowledge receipt of this bid addendum by signing on page "P-4" of the proposal within the bid contract documents AND by filling out and signing within the rectangle on the first page of this bid addendum and e-mailing it to *janet.zuazo@costamesaca.gov*.

Sincerely,

S. Yang

Seung Yang, P.E.
City Engineer

SY: Attachments

Jack Hammett Sports Complex

Costa Mesa, CA

Lighting System

Pole/Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1	80'	80'	3	TLC-LED-1500	4.23 kW	A
A2	80'	80'	2	TLC-LED-1500	2.82 kW	A
		80'	2	TLC-LED-900	1.76 kW	A
A3	80'	80'	2	TLC-LED-1500	2.82 kW	B
		80'	2	TLC-LED-900	1.76 kW	B
A5	80'	80'	3	TLC-LED-1500	4.23 kW	B
B1	80'	80'	4	TLC-LED-1500	5.64 kW	A
B2	80'	80'	4	TLC-LED-1500	5.64 kW	B
C1	80'	80'	3	TLC-LED-1500	4.23 kW	B
		80'	3	TLC-LED-1500	4.23 kW	A
C2	80'	80'	2	TLC-LED-1500	2.82 kW	A
		80'	2	TLC-LED-1500	2.82 kW	B
		80'	2	TLC-LED-900	1.76 kW	A
		80'	2	TLC-LED-900	1.76 kW	B
D1	80'	80'	4	TLC-LED-1500	5.64 kW	B
		80'	4	TLC-LED-1500	5.64 kW	A
S1	80'	80'	2	TLC-LED-1200	2.34 kW	C
		80'	2	TLC-LED-900	1.76 kW	C
S2	80'	80'	2	TLC-LED-1200	2.34 kW	D
		80'	2	TLC-LED-900	1.76 kW	D
S3	80'	80'	2	TLC-LED-1200	2.34 kW	E
		80'	2	TLC-LED-1200	2.34 kW	C
		80'	2	TLC-LED-900	1.76 kW	C
		80'	2	TLC-LED-900	1.76 kW	E
S4	80'	80'	2	TLC-LED-1200	2.34 kW	D
		80'	2	TLC-LED-1200	2.34 kW	F
		80'	2	TLC-LED-900	1.76 kW	D
		80'	2	TLC-LED-900	1.76 kW	F
S5	80'	80'	2	TLC-LED-1200	2.34 kW	E
		80'	2	TLC-LED-900	1.76 kW	E
S6	80'	80'	2	TLC-LED-900	1.76 kW	F
		80'	2	TLC-LED-1200	2.34 kW	F
S7 S10	60'	60'	4	TLC-LED-900	3.52 kW	G
S8	60'	60'	4	TLC-LED-900	3.52 kW	H
		60'	4	TLC-LED-900	3.52 kW	G
S9	60'	60'	4	TLC-LED-900	3.52 kW	H
S11	70'	70'	4	TLC-LED-900	3.52 kW	H
		70'	4	TLC-LED-900	3.52 kW	G
S12	70'	70'	4	TLC-LED-900	3.52 kW	H
21			**108**		**118.76 kW**	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Soccer 1	28.90 kW	22
B	Soccer 2	28.90 kW	22
C	Soccer 3 North	8.20 kW	8
D	Soccer 3 South	8.20 kW	8
E	Soccer 4 North	8.20 kW	8
F	Soccer 4 South	8.20 kW	8
G	Soccer 5	14.08 kW	16
H	Soccer 6	14.08 kW	16

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	150,000	>120,000	>120,000	>120,000	16
TLC-LED-1500	LED 5700K - 75 CRI	1410W	181,000	>120,000	>120,000	>120,000	36
TLC-LED-900	LED 5700K - 75 CRI	880W	104,000	>120,000	>120,000	>120,000	56

From Hometown to Professional

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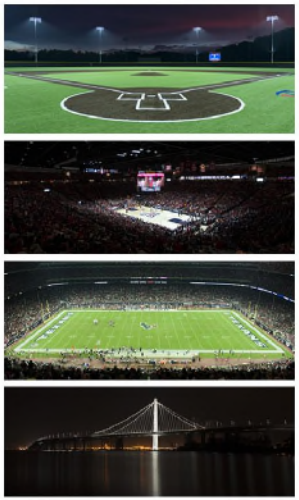
Jack Hammett Sports Complex
Costa Mesa, CA

Single Luminaire Amperage Draw Chart							
Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3

Light Level Summary

Calculation Grid Summary									
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Soccer 1	Horizontal Illuminance	32.8	26	42	1.63	1.26	A	22
Soccer 2	Horizontal Illuminance	32.8	26	45	1.76	1.26	B	22
Soccer 3	Horizontal Illuminance	30.1	23	39	1.70	1.31	C,D	16
Soccer 4	Horizontal Illuminance	30.1	23	38	1.67	1.31	E,F	16
Soccer 5	Horizontal Illuminance	24.4	16	43	2.61	1.53	G	16
Soccer 6	Horizontal Illuminance	24.1	17	38	2.20	1.42	H	16
Spill @ Fence	Horizontal	0.05	0	0.20	0.00		A,B,C,D,E,F,G,	108
Spill @ Fence	Max Vertical Illuminance Metric	0.08	0	0.37	0.00		A,B,C,D,E,F,G,	108

From Hometown to Professional



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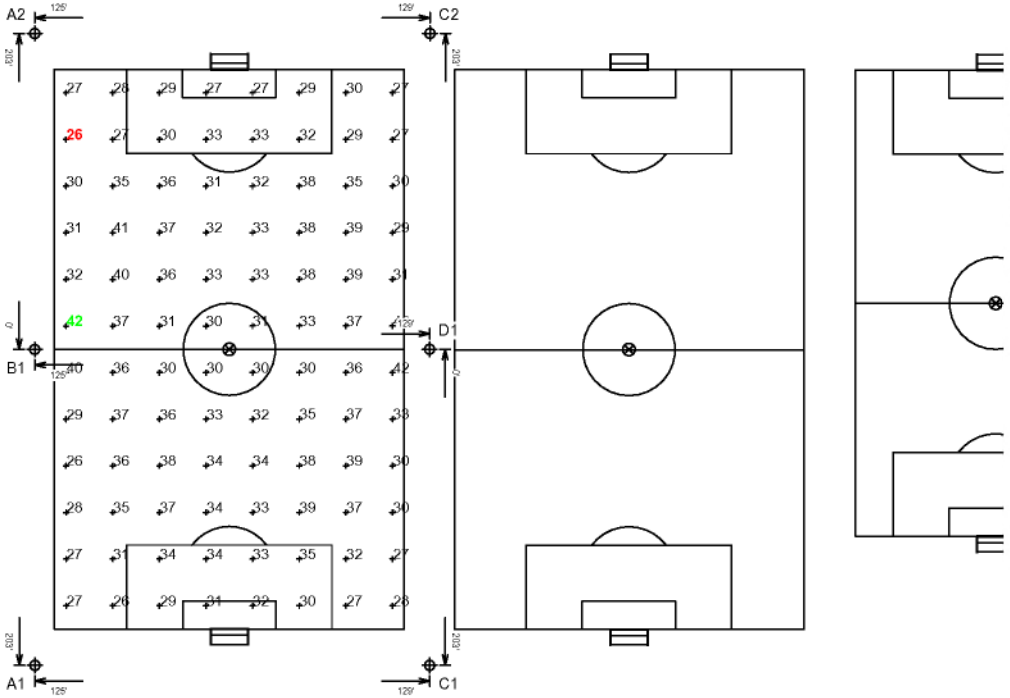
Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A1	80'	-	80'	TLC-LED-1500	3	3	0
1	A2	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
1	B1	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	3	3
1	C2	80'	-	80'	TLC-LED-1500	4	2	2
				80'	TLC-LED-900	4	2	2
1	D1	80'	-	80'	TLC-LED-1500	4/4*	4	4
6	Totals					33	22	11

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



Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 1
Size	360' x 225'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average	**30**
Scan Average	32.81
Maximum	42
Minimum	26
Avg/Min	1.28
Guaranteed Max/Min	**2.5**
Max/Min	1.63
UG (adjacent pts)	1.38
CU	0.76
No. of Points	96
LUMINAIRE INFORMATION	
Applied Circuits	A
No. of Luminaires	**22**
Total Load	28.90 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

ENGINEERED DESIGN By: • File #224349C • 12-Oct-23

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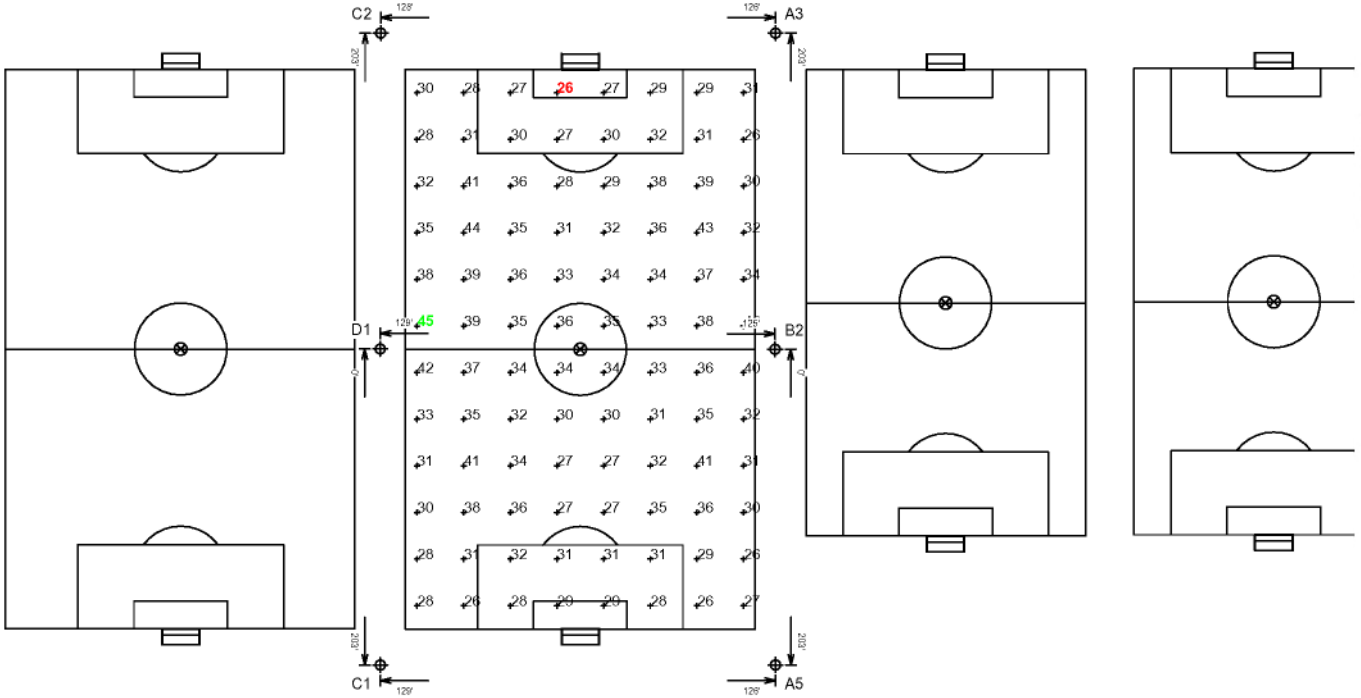
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
1	A5	80'	-	80'	TLC-LED-1500	3	3	0
1	B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	3	3
1	C2	80'	-	80'	TLC-LED-1500	4	2	2
				80'	TLC-LED-900	4	2	2
1	D1	80'	-	80'	TLC-LED-1500	4/4*	4	4
6	Totals					33	22	11

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



Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 2
Size	360' x 225'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average	30
Scan Average	32.78
Maximum	45
Minimum	26
Avg/Min	1.28
Guaranteed Max/Min	2.5
Max/Min	1.76
UG (adjacent pts)	1.36
CU	0.76
No. of Points	96
LUMINAIRE INFORMATION	
Applied Circuits	B
No. of Luminaires	22
Total Load	28.90 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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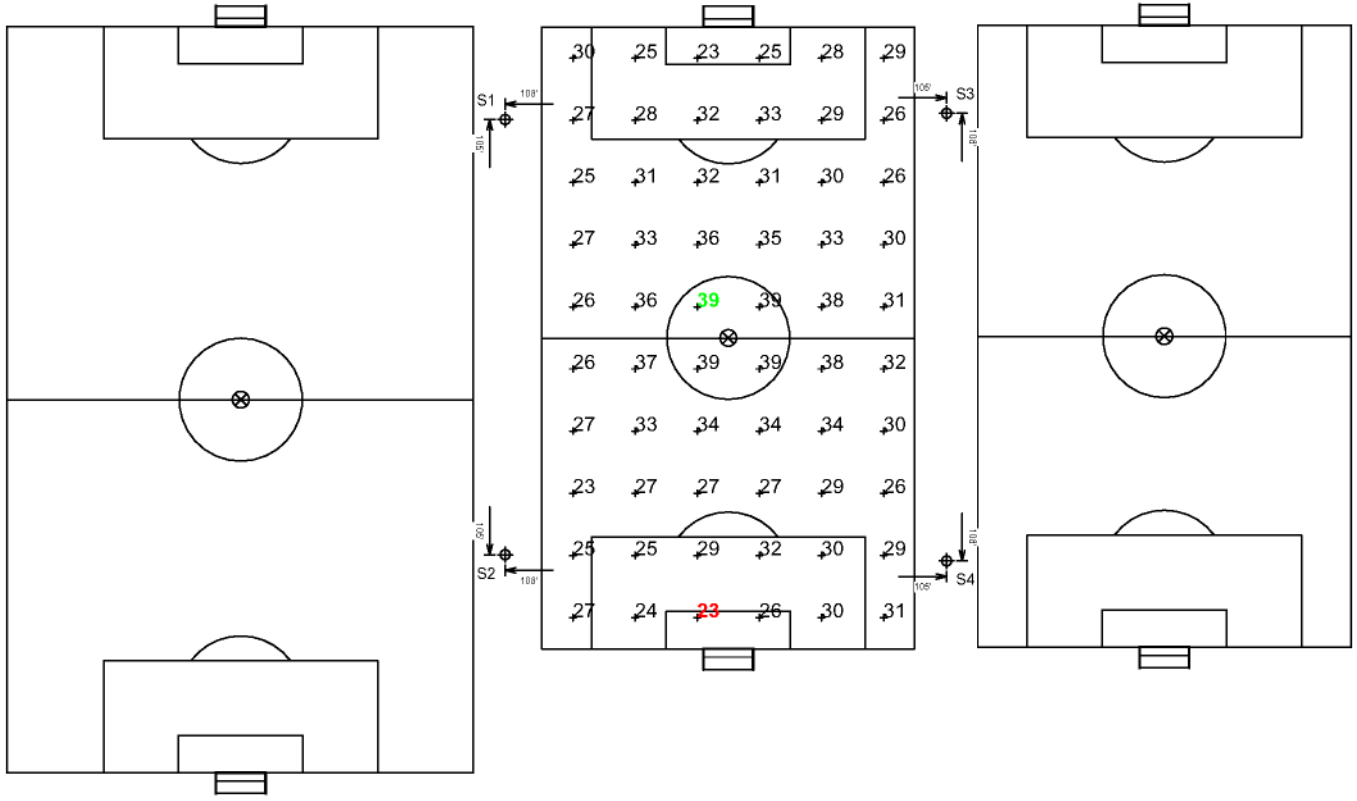
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	S1-S2	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	2	2
				80'	TLC-LED-900	2/2*	2	2
4	Totals					24	16	8

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



SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 3
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average	30
Scan Average	30.10
Maximum	39
Minimum	23
Avg/Min	1.31
Guaranteed Max/Min	2.5
Max/Min	1.70
UG (adjacent pts)	1.39
CU	0.79
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	C,D
No. of Luminaires	16
Total Load	16.40 kW

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 RP-6-15.

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

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

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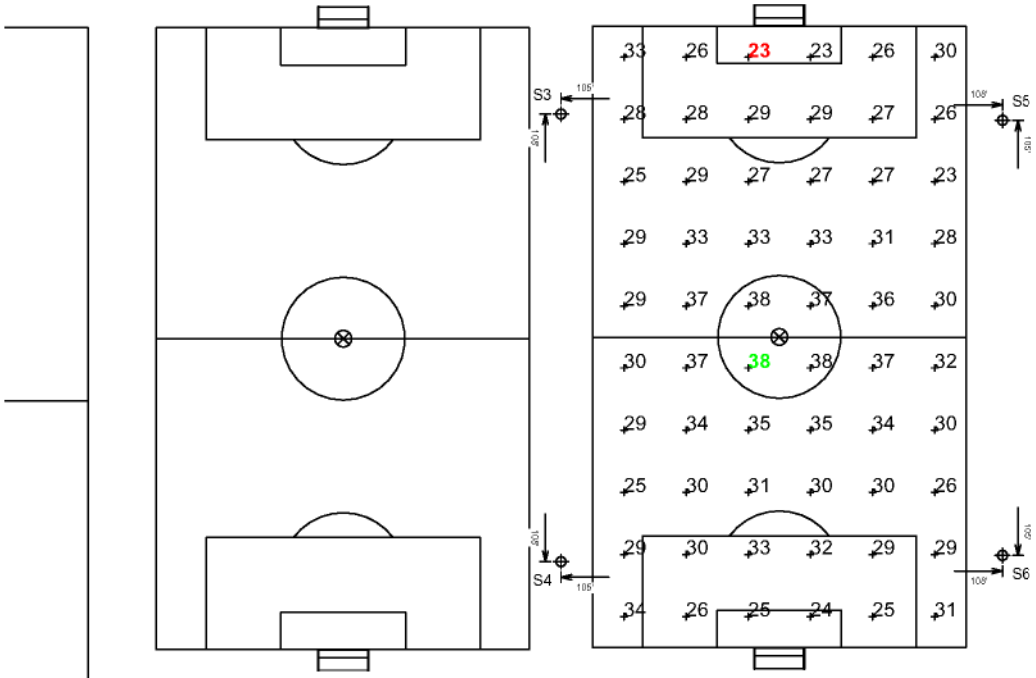
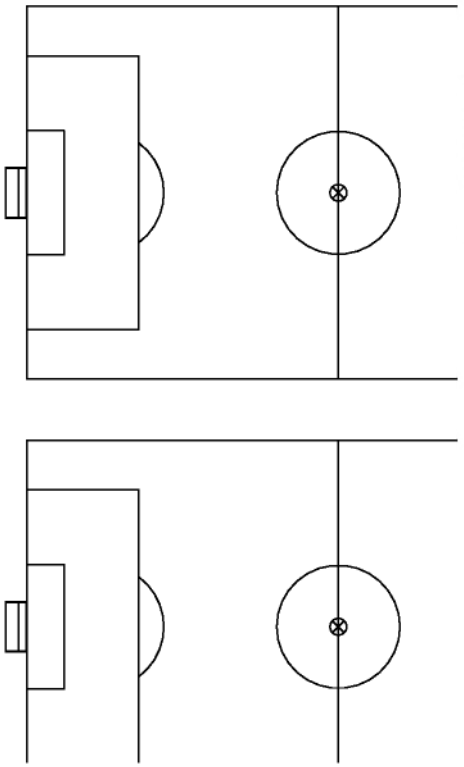
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	2	2
				80'	TLC-LED-900	2/2*	2	2
2	S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
4	Totals					24	16	8

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





SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 4
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average	30
Scan Average	30.12
Maximum	38
Minimum	23
Avg/Min	1.31
Guaranteed Max/Min	2.5
Max/Min	1.67
UG (adjacent pts)	1.35
CU	0.80
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	E,F
No. of Luminaires	16
Total Load	16.40 kW

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 RP-6-15.

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

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

ENGINEERED DESIGN By: • File #224349C • 12-Oct-23

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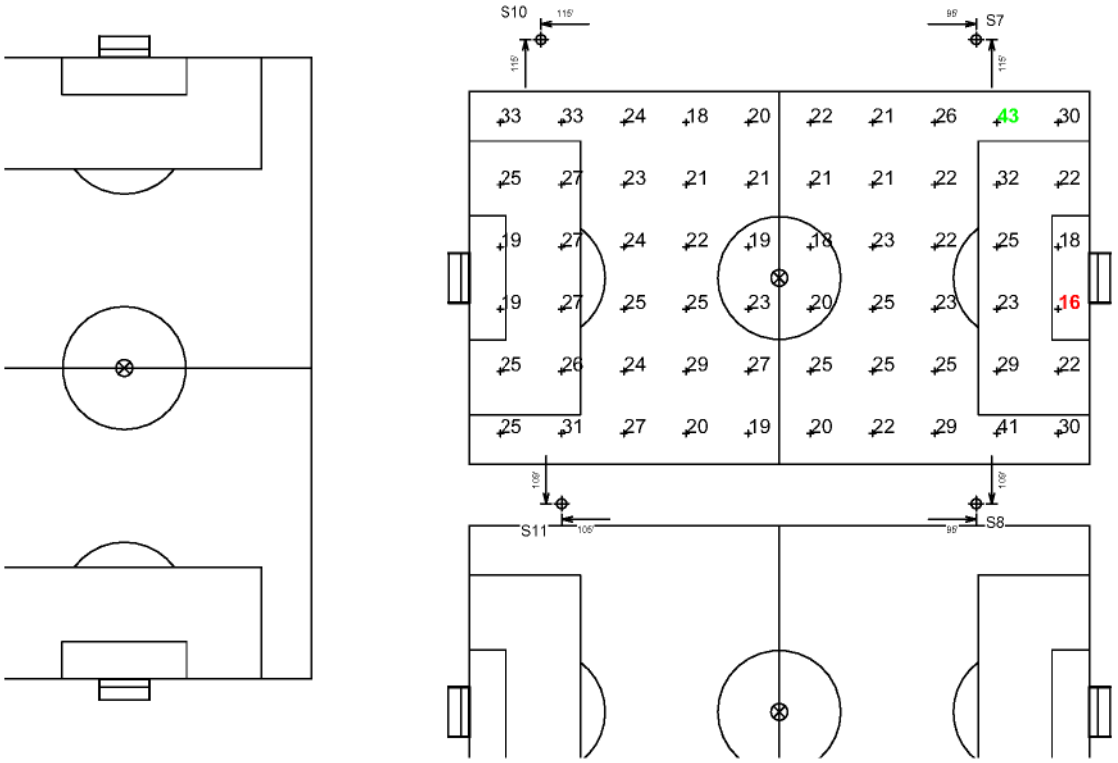
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	S7 S10	60'	-	60'	TLC-LED-900	4	4	0
1	S8	60'	-	60'	TLC-LED-900	4/4*	4	4
1	S11	70'	-	70'	TLC-LED-900	4/4*	4	4
4	Totals					24	16	8

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



SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 5
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average	24.43
Maximum	43
Minimum	16
Avg/Min	1.49
Max/Min	2.61
UG (adjacent pts)	1.66
CU	0.81
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	G
No. of Luminaires	16
Total Load	14.08 kW

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 RP-6-15.

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

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

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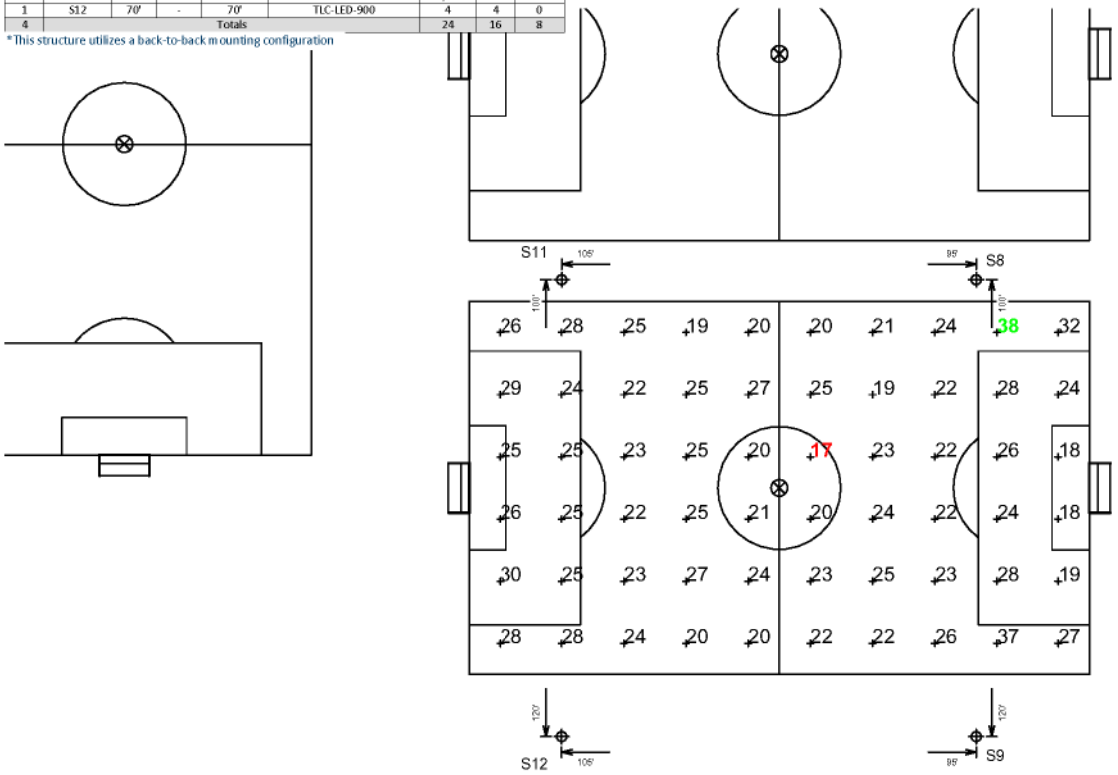
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires			
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	S8	60'	-	60'	TLC-LED-900	4/4*	4	4
1	S9	60'	-	60'	TLC-LED-900	4	4	0
1	S11	70'	-	70'	TLC-LED-900	4/4*	4	4
1	S12	70'	-	70'	TLC-LED-900	4	4	0
4	Totals					24	16	8

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



Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Soccer 6
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average	24.13
Maximum	38
Minimum	17
Avg/Min	1.39
Max/Min	2.20
UG (adjacent pts)	1.61
CU	0.80
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	H
No. of Luminaires	16
Total Load	14.08 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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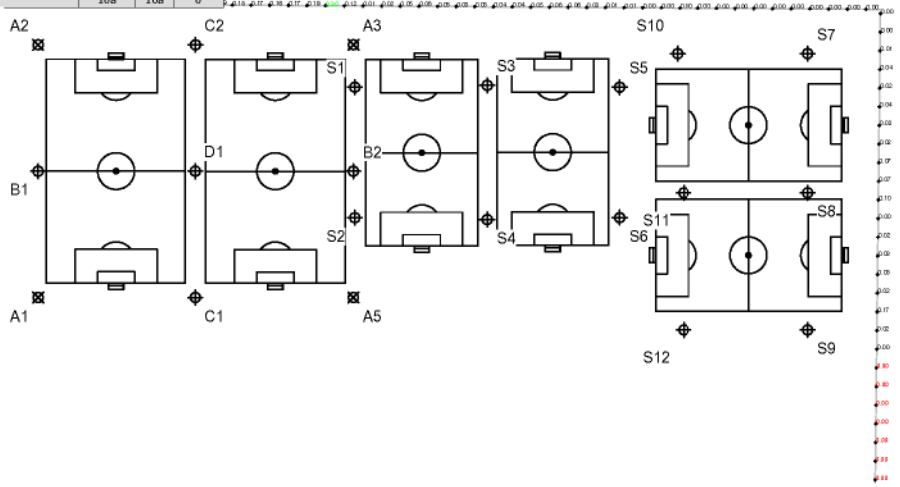
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	A1 A5	80'	-	80'	TLC-LED-1500	3	3	0
2	A2-A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
2	B1-B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	6	0
1	C2	80'	-	80'	TLC-LED-1500	4	4	0
				80'	TLC-LED-900	4	4	0
1	D1	80'	-	80'	TLC-LED-1500	4/4*	8	0
4	S1-S2 S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	4	0
				80'	TLC-LED-900	2/2*	4	0
3	S7 S9-S10	60'	-	60'	TLC-LED-900	4	4	0
1	S8	60'	-	60'	TLC-LED-900	4/4*	8	0
1	S11	70'	-	70'	TLC-LED-900	4/4*	8	0
1	S12	70'	-	70'	TLC-LED-900	4	4	0
21	Totals					108	108	0

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



SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Spill @ Fence
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average	0.0480
Maximum	0.20
Minimum	0.00
CU	0.00
No. of Points	75
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D,E,F,G,H
No. of Luminaires	108
Total Load	118.76 kW

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 RP-6-15.

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

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

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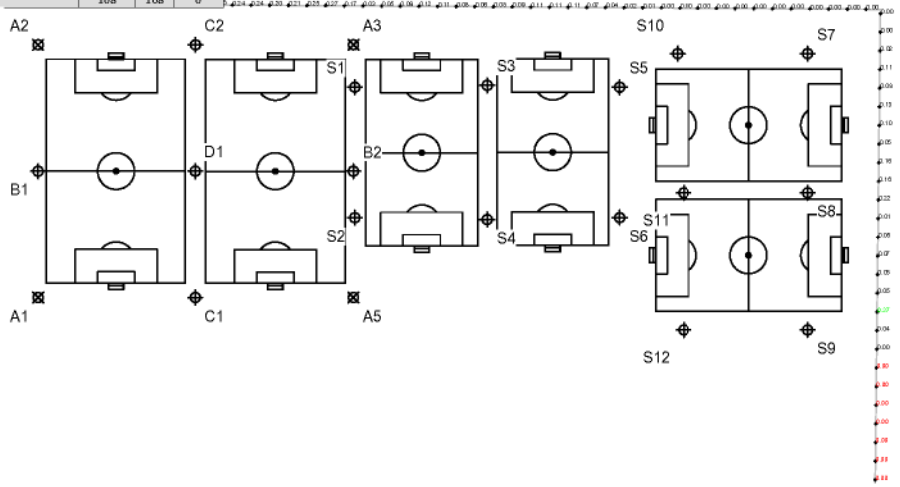
ILLUMINATION SUMMARY

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	A1 A5	80'	-	80'	TLC-LED-1500	3	3	0
2	A2-A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
2	B1-B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	6	0
1	C2	80'	-	80'	TLC-LED-1500	4	4	0
				80'	TLC-LED-900	4	4	0
1	D1	80'	-	80'	TLC-LED-1500	4/4*	8	0
4	S1-S2 S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	4	0
				80'	TLC-LED-900	2/2*	4	0
3	S7 S9-S10	60'	-	60'	TLC-LED-900	4	4	0
1	S8	60'	-	60'	TLC-LED-900	4/4*	8	0
1	S11	70'	-	70'	TLC-LED-900	4/4*	8	0
1	S12	70'	-	70'	TLC-LED-900	4	4	0
21	Totals					108	108	0

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



SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Jack Hammett Sports Complex

Costa Mesa, CA

Grid Summary

Name	Spill @ Fence
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED MAX VERTICAL FOOTCANDLES

	Entire Grid
Scan Average	0.0806
Maximum	0.37
Minimum	0.00
CU	0.00
No. of Points	75
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D,E,F,G,H
No. of Luminaires	108
Total Load	118.76 kW

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 RP-6-15.

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

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

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ILLUMINATION SUMMARY

Jack Hammett Sports Complex

Costa Mesa, CA

Equipment Layout

INCLUDES:
- Soccer 1
- Soccer 2
- Soccer 3
- Soccer 4
- Soccer 5
- Soccer 6

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

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

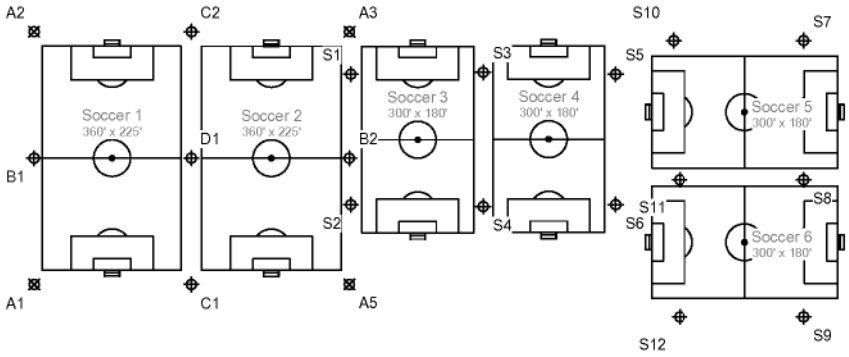
Equipment List For Areas Shown

		Pole		Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE
2	A1 A5	80'	-	80'	TLC-LED-1500	3
2	A2-A3	80'	-	80'	TLC-LED-1500	2
				80'	TLC-LED-900	2
2	B1-B2	80'	-	80'	TLC-LED-1500	4
1	C1	80'	-	80'	TLC-LED-1500	6
1	C2	80'	-	80'	TLC-LED-1500	4
				80'	TLC-LED-900	4
1	D1	80'	-	80'	TLC-LED-1500	4/4*
4	S1-S2 S5-S6	80'	-	80'	TLC-LED-1200	2
				80'	TLC-LED-900	2
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*
				80'	TLC-LED-900	2/2*
3	S7 S9-S10	60'	-	60'	TLC-LED-900	4
1	S8	60'	-	60'	TLC-LED-900	4/4*
1	S11	70'	-	70'	TLC-LED-900	4/4*
1	S12	70'	-	70'	TLC-LED-900	4
21	Totals					108

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

Single Luminaire Amperage Draw Chart

Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3



SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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EQUIPMENT LAYOUT

Jack Hammett Sports Complex

Costa Mesa, CA

Equipment Layout

INCLUDES:
- Soccer 1
- Soccer 2
- Soccer 3
- Soccer 4
- Soccer 5
- Soccer 6

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

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

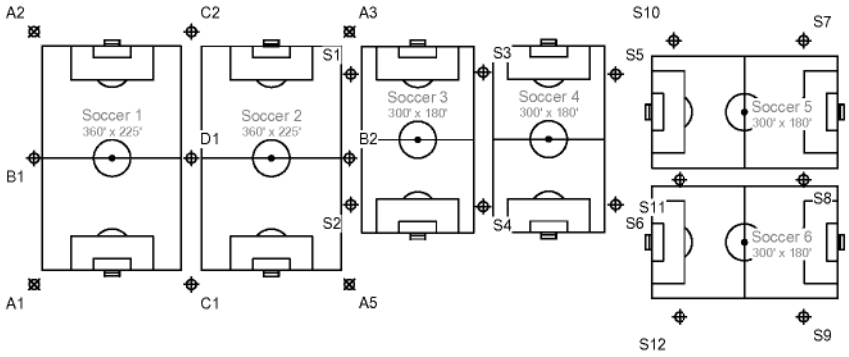
Equipment List For Areas Shown

		Pole		Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE
2	A1 A5	80'	-	80'	TLC-LED-1500	3
2	A2-A3	80'	-	80'	TLC-LED-1500	2
				80'	TLC-LED-900	2
2	B1-B2	80'	-	80'	TLC-LED-1500	4
1	C1	80'	-	80'	TLC-LED-1500	6
1	C2	80'	-	80'	TLC-LED-1500	4
				80'	TLC-LED-900	4
1	D1	80'	-	80'	TLC-LED-1500	4/4*
4	S1-S2 S5-S6	80'	-	80'	TLC-LED-1200	2
				80'	TLC-LED-900	2
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*
				80'	TLC-LED-900	2/2*
3	S7 S9-S10	60'	-	60'	TLC-LED-900	4
1	S8	60'	-	60'	TLC-LED-900	4/4*
1	S11	70'	-	70'	TLC-LED-900	4/4*
1	S12	70'	-	70'	TLC-LED-900	4
21	Totals					108

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

Single Luminaire Amperage Draw Chart

Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3



SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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EQUIPMENT LAYOUT

System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Project Information

Control System

Control System ID:	1 of 1
Control System Type:	Control-Link® Control and Monitoring System
Communication Type:	PowerLine-ST

Power Requirements

Control cabinet(s):	
Control voltage (phase to neutral)	120/60
VA loading - Inrush	7646.0
VA loading - Sealed	877.0
Lighting Circuits:	
Voltage/Hertz/Phase	480/60/3

Project Notes:

Preliminary Plans: Confirm all details - see Note 1

Equipment Listing

Description	Qty	Size (in)
Control and monitoring cabinet - primary	1	24 X 72
Control and monitoring cabinet - primary	1	24 X 48
Control and monitoring cabinet - secondary	1	24 X 72
Contactors, 30 amperes	28	-
Off/On/Auto switches	8	-

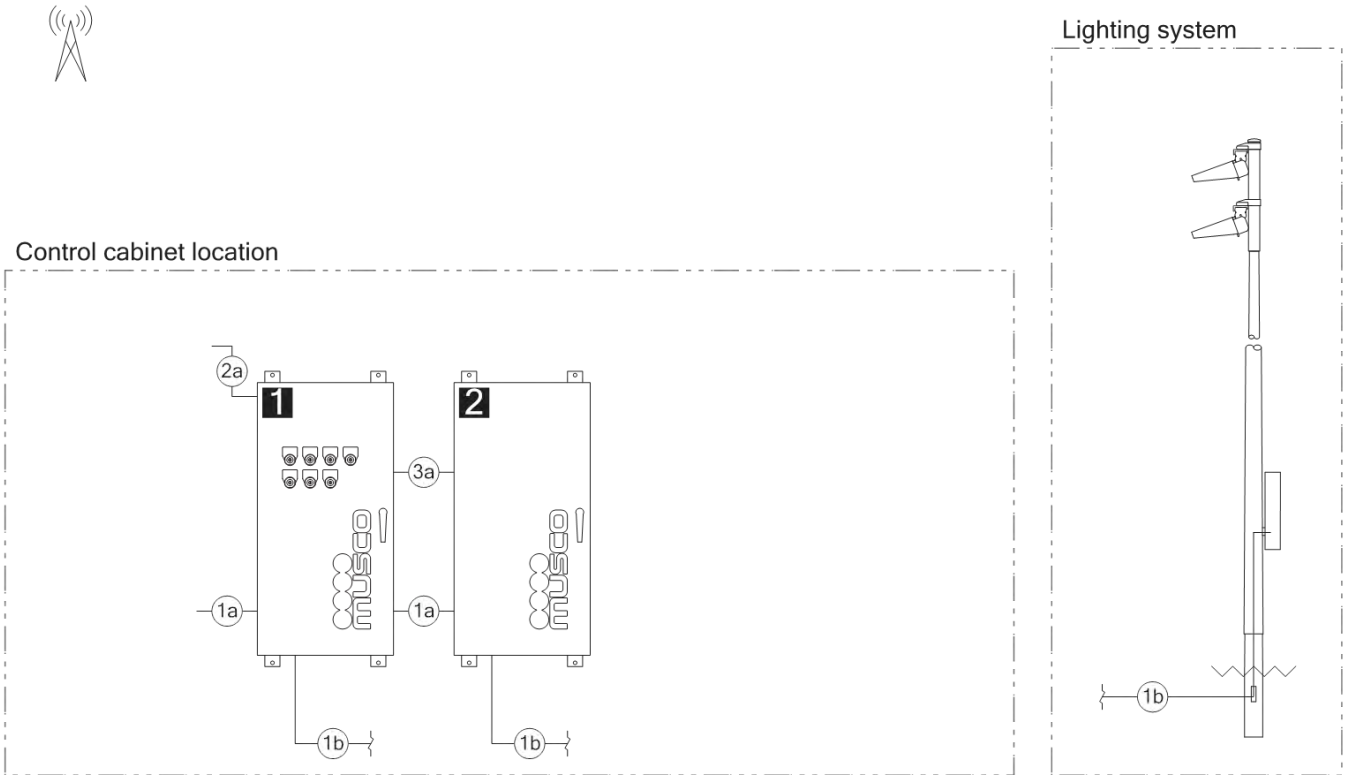
Important Notes:

1. Please confirm that the lighting circuit voltage listed above is accurate for this facility. This is the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole location. Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each circuit at each pole location. Contactors are 3 pole and 100% rated for the published continuous load.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. Size overcurrent devices using the full load amps column of the Circuit Summary by Switch chart (Minimum power factor is 0.9). Size conduit per code unless otherwise specified as larger to allow for harness connectors.
6. Avoid use of in-ground junction/pull boxes when possible. If used, all wire connectors must be UL listed for Wet Locations to prevent leakage current.
7. Control power wiring must be in separate conduit from line or load power wiring. Communication cables must be in separate conduit from any power wiring.
8. Refer to Installation Instructions for more details on equipment information and the installation requirements.

System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Equipment Layout and Connection Details



Connection Details

ID	Description
1a	Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1b	Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
2a	Control power with equipment ground to control cabinet. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
3a	Control harnesses - Secondary cabinet to primary cabinet. Harness is provided by Musco in 8-foot length. Use minimum 2 inch diameter conduit for harness connector.

Equipment

ID	Description
1	Control and monitoring cabinet - primary
2	Control and monitoring cabinet - secondary

System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Circuit Summary

Switching Schedule	
Field/Switch Description	**Switches**
Soccer 1	**1**
Soccer 2	**2**
Soccer 3	**3,4**
Soccer 3 North	3
Soccer 3 South	4
Soccer 4	**5,6**
Soccer 4 North	5
Soccer 4 South	6
Soccer 5	**7**
Soccer 6	**8**

Control Module ID: 1

Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
1	Soccer 1	A1	3	6.29	30	1	C1
	Soccer 1	A2	4	8.24	30	1	C2
	Soccer 1	B1	4	9.43	30	1	C3
	Soccer 1	C1	3	6.29	30	1	C4
	Soccer 1	C2	4	8.24	30	1	C5
	Soccer 1	D1	4	9.43	30	1	C6
2	Soccer 2	A3	4	8.24	30	1	C7
	Soccer 2	A5	3	6.29	30	1	C8
	Soccer 2	B2	4	9.43	30	1	C9
	Soccer 2	C1	3	6.29	30	1	C10
	Soccer 2	C2	4	8.24	30	1	C11
	Soccer 2	D1	4	9.43	30	1	C12
3	Soccer 3 North	S1	4	7.15	30	2	C13
	Soccer 3 North	S3	4	7.15	30	2	C14
4	Soccer 3 South	S2	4	7.15	30	2	C15
	Soccer 3 South	S4	4	7.15	30	2	C16
5	Soccer 4 North	S3	4	7.15	30	2	C17
	Soccer 4 North	S5	4	7.15	30	2	C18
6	Soccer 4 South	S4	4	7.15	30	2	C19

System Requirements: Control System Summary

Circuit Summary - Cont'd

Control Module ID: 1

Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
	Soccer 4 South	S6	4	7.15	30	2	C20
7	Soccer 5	S7	4	5.87	30	2	C21
	Soccer 5	S8	4	5.87	30	2	C22
	Soccer 5	S10	4	5.87	30	2	C23
	Soccer 5	S11	4	5.87	30	2	C24

Control Module ID: 2

Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
8	Soccer 6	S8	4	5.87	30	3	C25
	Soccer 6	S9	4	5.87	30	3	C26
	Soccer 6	S11	4	5.87	30	3	C27
	Soccer 6	S12	4	5.87	30	3	C28

CITY OF COSTA MESA

P.O. BOX 12000 77 FAIR DRIVE CALIFORNIA 92628·1200

FROM THE PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION

DATE: **NOVEMBER 8, 2023**

TO: **ALL PROSPECTIVE BIDDERS**

SUBJECT: **ADDENDUM NO. 2 –**
LED LIGHTING AT CITY PARKS AND ATHLETIC FACILITIES PROJECT,
CITY PROJECT NO. 23-09

Please forward this addendum to the appropriate individual as soon as possible. To assist our office in confirming the delivery of this addendum, please sign acknowledging receipt herein and e-mail a copy of this sheet to janet.zuazo@costamesaca.gov. **A COPY WILL NOT BE SENT BY MAIL.**

Received by: _____

Company: _____

All bidders shall register with PlanetBids.com in order to retrieve addenda. It is the responsibility of each prospective bidder to check the City's PlanetBids.com portal at: https://www.planetbids.com/portal/portal.cfm?CompanyID=45476 on a DAILY basis through the close of bids for any applicable addenda or updates.

This addendum, effective on this date, addresses the following items:

The following are additional documents / plans related to the *Jack Hammett Sports Complex* LED lighting –

- TeWinkle Tennis Center pole foundation structural calculations (see attached, starting on page 3).
- Bill of Materials for the following:
  - Jack Hammett Sports Complex (see attached, starting on page 28)
  - TeWinkle Bark Park (see attached, starting on page 29)
  - TeWinkle Baseball Field (see attached, starting on page 30)
  - TeWinkle Tennis Center (see attached, starting on page 31)

The contents of this bid addendum shall have precedence over all related provisions within the contract documents. It is the intent of the City of Costa Mesa to clarify the above-referenced items to all bidders. Should it be necessary to request clarification on these matters, please send your request via e-mail at *janet.zuazo@costamesaca.gov*.

Please acknowledge receipt of this bid addendum by signing on page "P-4" of the proposal within the bid contract documents AND by filling out and signing within the rectangle on the first page of this bid addendum and e-mailing it to *janet.zuazo@costamesaca.gov*.

Sincerely,

Seung Yang, P.E.
City Engineer

SY: Attachments

MUSCO LIGHTING, INC.
Light Structure Pole and Foundation Standard

This confidential report is provided exclusively for the use of engineering approval. The technical information provided herein is the confidential property of Musco Lighting, Inc., and reproduction of this report or use of this information for anything other than its limited, intended purpose as to this project, without the written permission of Musco Lighting, Inc., is prohibited.

ITEM : **Structural Calculations**
Pole Foundation Standard

PROJECT : **Tewinkle Park Tennis**
Costa Mesa, CA

PROJECT NO : **215837**
463.358

DATE : **11/7/2023**

ENGINEER : KNA STRUCTURAL ENGINEERS
JOSH RANDALL, SE No. 4506
9931 Muirlands Blvd
Irvine, CA 92618

MUSCO LIGHTING, INC.
Light Structure Pole and Foundation Standard

Calculation Index

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APPENDIX A	Wind & Seismic Parameters	

CODE REFERENCE:

2022 CBC

ACI 318-19
Building Code Requirements for Structural Concrete

AISC 360-16
Specifications for Structural Steel Buildings

ATTACHMENT 2

KNA STRUCTURAL ENGINEERS

POLE DESIGNATION: LS50-A W/ 2 FIXTURES
MANUFACTURER: MUSCO
PROJECT NO: 215837

JOB NO: 463.358
PROJECT: Tewinkle Park Tennis
LOCATION: Costa Mesa, CA

POLE ID: T1, T4, T8, T9, T11, T14

ASCE 7-16
WIND CRITERIA 95 MPH,EXP C
LOAD COMB 1.2 DEAD + 1.0 WIND

LED **550**

EPA/FIXTURE*, Af	=	1.70	ft2
D.L./FIXTURE**	=	50.5	lbs
D.L. ECE/FIXTURE***	=	10.0	lbs

* EPA = EFFECTIVE PROJECTED AREA OF LIGHT FIXTURE INCLUDING CROSSARM, PER MUSCO
** D.L.= DEAD LOAD OF FIXTURE, & CROSSARM, PER MUSCO
***D.L.= DEAD LOAD OF ECE, PER MUSCO

| P = SUPERIMPOSED WT + POLE WT

<--FIXTURES, F/Af= qz*Gf*Cf = 30.97 PSF MAX *(29.4-1)*
<--where qz=.00256*Kz*Kzt*Kd*Ke(V)^2 = 25.36 PSF MAX *(26.10-1)*

ATTACHMENT TYPE	NUMBER	DIST. FROM TOP POLE,FT	PA SQ FT	Cf	EPA SQ FT	Kz	qz PSF	WIND,F LBS	WEIGHT,P LBS
LED550	2.0	0.5		1.0	1.70	1.095	25.31	105	101
	0.0	3.0		1.3	1.70	1.084	25.04	0	0
	0.0	5.5		1.3	1.70	1.072	24.76	0	0
	0.0	8.0		1.3	1.70	1.059	24.47	0	0
	0.0	10.5		1.3	1.70	1.046	24.16	0	0
	0.0	13.0		1.3	1.70	1.032	23.83	0	0
	0.0	15.5		1.3	1.70	1.017	23.49	0	0
	0.0	18.0		1.3	1.70	1.001	23.13	0	0
	0.0	20.5		1.3	1.70	0.985	22.75	0	0
	0.0	23.0		1.3	1.70	0.967	22.34	0	0
ECE	2.0	39.2	4.00	1.3	5.20	0.849	19.61	125	20
							TOTALS =	230	121

POLE, F/Af= qz*Gf*Cf = 37.17 PSF MAX *(29.4-1)*
where qz=.00256*Kz*Kzt*Kd*Ke(V)^2 = 25.36 PSF MAX *(26.10-1)*

LOADING DIAGRAM

INPUT

-> l =	50.87	ft. (ht. from adj. grade)	
-> l =	50.87	ft. (ht. from grade)	
->tA =	0.12	in. (pole thk. @ top)	
->dA =	4.75	in. (pole diam. @ top)	
->dB =	9.44	in. (pole diam. @ btm)	
->tB =	0.12	in. (pole thk. @ btm)	
->Fy =	38.0	ksi (fixt mount sect. =	15.0 ft)
->Fy =	55.0	ksi (other pole sect.)	
-> E =	29,000	ksi	
->Kzt=	1	*(Figure 26.8-1)*	
->Kd =	1	*(Table 26.6-1)*	
-> Kz =	1.098	MAX-EXP C @ 50.9 FT.	*(Table 26.10-1)*
->Ke =	1.00		*(Table 26.9-1)*
-> Cf =	1.00	LIGHT FIXTURE (INCLUDED IN EPA)	
-> Cf =	1.200	MAX (VARIES 0.5-1.2 FOR RND POLE)	*(Figure 29.4-1)*

POLE DAMPING, beta= 0.025 *Per Musco test*

OUTPUT

-> POLE NATURAL FREQUENCY = 0.593 Hz *1/(2PI*(DELTA/386)^0.5) where DELTA is due to self weight*
-> Gf= 1.22 *(Section 26.11.5)* *(Reference Vibration Problems in Engineering by Timoshenko, 4th ED. pg.34)*

Pole Properties:

Ia =	4.68	in4	taper =	0.140	in/ft
Ib =	38	in4	db/da =	1.987	
ra =	1.638	in	rb =	3.295	in.
Aa =	1.745	in2	Ab =	3.51	in2
Sa =	1.97	in3	Sb =	8.08	in3

From Critical Buckling Loads of Tapered Columns, ASCE 2/62:

n =	Log (Ib/(Ia)/Log (dB/dA) =	3.06	
P* =	(Ib/Ia)/(Ib/Ia)^.333 =	4.1	
kl/req*	(1/(P*)^.5)[kl/ra] =	389	(where k= 2.1)

AISC 360-16 Specification Table B4.1, Case 15

	for Fy =	55.0 KSI	38	KSI
D/t < .45E/Fy =		237	343	(MAX)
D/t < .31E/Fy =		163	237	Noncompact
D/t < .07E/Fy =		37	53	Compact
D/t < .11E/Fy =		58	84	Slender element Section for Uniform Compression

Section 26.11.5 Gust-Effect Factor

constant epsilon,e =		0.2	Lz	=	492.3
constant l	=	500	N1	=	3.259
Vz	=	89.49	Rn	=	0.066
4.6n1h/Vz	=	1.549			
4.6n1B/Vz	=	0.018	R	=	1.072
15.4n1L/Vz	=	0.060	g_R	=	4.063
			c	=	0.200
Rh	=	0.447	Iz	=	0.203
RB	=	0.988	Q	=	0.932
RL	=	0.961	G	=	0.891
			Gf =		1.221

SHEAR,F=	0.540	*KIPS*	MOMENT, M =	15.29	*K-FT*	e= M/F =	28.30	*FT* AXIAL,P =	0.560	*KIPS*	**ASD Forces at groundline (for foundation design)**
SHEAR,F=	0.900	*KIPS*	MOMENT, M =	25.48	*K-FT*	e= M/F =	28.30	*FT* AXIAL,P =	0.672	*KIPS*	**Nominal Forces at groundline**

M < ΦMn = 42 K-FT Precast Base O.K.

Pole Stress Check = 0.660 Max. < 1 Pole O.K.

Max. Deflection = 45.676 Inch <0.10H= 61 Inch AASHTO 10.4.2

ATTACHMENT 2

Distance from top of Pole FT	Outside Diameter of Pole,D IN	Pole thick,t IN	D/t	Kz	qz PSF	Cf Pole	kl/r eqiv.	E3-4 Fe	E3-2 or E3-3 Design comp strength, Pn KIPS	Acting unfactored, Pr KIPS	F8.1-F8.4 Design flex. strength, Mn K-FT	Req'd flex. strength, Mr K-FT	Pr/Pc	H1-1b for Pr/Pc <0.2	H1-1a for Pr/Pc ≥ 0.2	2nd Order /1st Order Moment FT-K	CSR O.K.	Req'd shear strength,, F KIPS	1st Order Delta IN	C2.2a P-Delta Moment FT-K	Total 2nd Order Moment FT-K	E7-4a Q	ACTING MOM DUE TO DL	M/I	DEFL DUE TO DL IN
0	4.75	0.120	39.6	1.098	25.36	1.2	389	1.89	2.61	0.000	7.89	0.0	0.000	0.000	N.A.	1.000	Y	0.000	45.7	0.0	0.0	1.3993	0.00	0.0003	27.85
1	4.75	0.120	39.6	1.093	25.26	1.2	389	1.89	2.61	0.107	7.89	0.1	0.049	0.034	N.A.	1.280	Y	0.120	44.1	0.0	0.1	1.3993	0.00	0.0124	26.87
2	4.75	0.120	39.6	1.089	25.15	1.2	389	1.89	2.61	0.113	7.89	0.2	0.052	0.054	N.A.	1.185	Y	0.134	42.5	0.0	0.2	1.3993	0.11	0.0365	25.90
3	4.75	0.120	39.6	1.084	25.04	1.2	389	1.89	2.61	0.119	7.89	0.3	0.055	0.076	N.A.	1.162	Y	0.149	41.0	0.1	0.4	1.3993	0.23	0.0619	24.92
4	4.75	0.120	39.6	1.079	24.93	1.2	389	1.89	2.61	0.125	7.89	0.5	0.057	0.099	N.A.	1.150	Y	0.163	39.4	0.1	0.6	1.3993	0.35	0.0885	23.95
5	4.75	0.120	39.6	1.074	24.82	1.2	389	1.89	2.61	0.131	7.89	0.7	0.060	0.125	N.A.	1.142	Y	0.178	37.9	0.1	0.7	1.3993	0.48	0.1165	22.98
6	4.75	0.120	39.6	1.069	24.70	1.2	389	1.89	2.61	0.137	7.89	0.8	0.063	0.152	N.A.	1.136	Y	0.192	36.3	0.1	1.0	1.3993	0.61	0.1457	22.02
7	4.75	0.120	39.6	1.064	24.58	1.2	389	1.89	2.61	0.143	7.89	1.0	0.066	0.182	N.A.	1.131	Y	0.206	34.8	0.1	1.2	1.3993	0.75	0.1761	21.06
8	4.75	0.120	39.6	1.059	24.47	1.2	389	1.89	2.61	0.149	7.89	1.3	0.068	0.213	N.A.	1.127	Y	0.220	33.2	0.2	1.4	1.3993	0.90	0.2079	20.12
9	4.75	0.120	39.6	1.054	24.34	1.2	389	1.89	2.61	0.154	7.89	1.5	0.071	0.246	N.A.	1.123	Y	0.235	31.7	0.2	1.7	1.3993	1.05	0.2409	19.19
10	4.75	0.120	39.6	1.048	24.22	1.2	389	1.89	2.61	0.160	7.89	1.7	0.074	0.281	N.A.	1.119	Y	0.249	30.3	0.2	1.9	1.3993	1.21	0.2751	18.27
11	4.75	0.120	39.6	1.043	24.09	1.2	389	1.89	2.61	0.166	7.89	2.0	0.077	0.318	N.A.	1.116	Y	0.263	28.8	0.2	2.2	1.3993	1.37	0.3107	17.36
12	4.75	0.120	39.6	1.037	23.97	1.2	389	1.89	2.61	0.172	7.89	2.2	0.079	0.357	N.A.	1.113	Y	0.277	27.3	0.3	2.5	1.3993	1.54	0.3475	16.48
13	4.75	0.120	39.6	1.032	23.83	1.2	389	1.89	2.61	0.178	7.89	2.5	0.082	0.397	N.A.	1.111	Y	0.290	25.9	0.3	2.8	1.3993	1.71	0.3855	15.61
14	4.75	0.120	39.6	1.026	23.70	1.2	389	1.89	2.61	0.184	7.89	2.8	0.085	0.439	N.A.	1.108	Y	0.304	24.6	0.3	3.1	1.3993	1.90	0.4124	14.76
15	4.84	0.120	40.3	1.020	23.56	1.2	389	1.89	2.66	0.191	10.77	3.1	0.086	0.365	N.A.	1.106	Y	0.318	23.2	0.3	3.5	1.1634	2.08	0.4202	13.94
16	4.98	0.120	41.5	1.014	23.42	1.2	389	1.89	2.74	0.197	11.36	3.5	0.086	0.380	N.A.	1.103	Y	0.332	21.9	0.4	3.8	1.1495	2.28	0.4203	13.14
17	5.12	0.120	42.7	1.008	23.28	1.2	389	1.89	2.81	0.204	11.96	3.8	0.087	0.393	N.A.	1.101	Y	0.346	20.6	0.4	4.2	1.1363	2.48	0.4196	12.37
18	5.26	0.120	43.8	1.001	23.13	1.2	389	1.89	2.89	0.210	12.58	4.2	0.087	0.406	N.A.	1.098	Y	0.361	19.4	0.4	4.6	1.1238	2.68	0.4182	11.63
19	5.4	0.120	45.0	0.995	22.98	1.2	389	1.89	2.97	0.217	13.21	4.5	0.088	0.419	N.A.	1.096	Y	0.376	18.2	0.4	5.0	1.1119	2.90	0.4163	10.90
20	5.54	0.120	46.2	0.988	22.83	1.2	389	1.89	3.05	0.224	13.86	4.9	0.088	0.431	N.A.	1.094	Y	0.391	17.1	0.5	5.4	1.1007	3.12	0.414	10.21
21	5.68	0.120	47.3	0.981	22.67	1.2	389	1.89	3.13	0.232	14.52	5.3	0.089	0.443	N.A.	1.092	Y	0.407	15.9	0.5	5.8	1.09	3.35	0.4115	9.54
22	5.82	0.120	48.5	0.974	22.51	1.2	389	1.89	3.21	0.239	15.20	5.7	0.089	0.455	N.A.	1.089	Y	0.423	14.9	0.5	6.2	1.0798	3.58	0.4086	8.89
23	5.96	0.120	49.7	0.967	22.34	1.2	389	1.89	3.29	0.247	15.90	6.2	0.090	0.466	N.A.	1.087	Y	0.439	13.8	0.5	6.7	1.0701	3.82	0.4057	8.26
24	6.1	0.120	50.8	0.960	22.17	1.2	389	1.89	3.37	0.255	16.60	6.6	0.091	0.477	N.A.	1.085	Y	0.455	12.8	0.6	7.2	1.0608	4.07	0.4025	7.67
25	6.24	0.120	52.0	0.952	22.00	1.2	389	1.89	3.45	0.263	17.33	7.1	0.092	0.487	N.A.	1.083	Y	0.471	11.9	0.6	7.7	1.052	4.33	0.3994	7.09
26	6.38	0.120	53.2	0.944	21.82	1.2	389	1.89	3.52	0.271	18.07	7.5	0.092	0.497	N.A.	1.081	Y	0.488	11.0	0.6	8.2	1.0435	4.60	0.3961	6.54
27	6.52	0.120	54.3	0.936	21.63	0.7	389	1.89	3.60	0.279	18.82	8.0	0.093	0.507	N.A.	1.079	Y	0.498	10.1	0.6	8.7	1.0354	4.87	0.3928	6.01
28	6.66	0.120	55.5	0.928	21.43	0.7	389	1.89	3.68	0.288	19.59	8.5	0.094	0.516	N.A.	1.078	Y	0.508	9.2	0.7	9.2	1.0277	5.16	0.3895	5.51
29	6.8	0.120	56.7	0.919	21.23	0.7	389	1.89	3.76	0.297	20.38	9.1	0.095	0.525	N.A.	1.076	Y	0.518	8.4	0.7	9.7	1.0202	5.45	0.3863	5.03
30	6.94	0.120	57.8	0.910	21.02	0.7	389	1.89	3.84	0.306	21.18	9.6	0.096	0.533	N.A.	1.074	Y	0.529	7.7	0.7	10.3	1.0131	5.75	0.383	4.57
31	7.08	0.120	59.0	0.901	20.81	0.7	389	1.89	3.92	0.315	21.99	10.1	0.096	0.541	N.A.	1.072	Y	0.539	6.9	0.7	10.8	1.0063	6.06	0.3798	4.14
32	7.22	0.120	60.2	0.891	20.58	0.7	389	1.89	4.00	0.324	22.83	10.7	0.097	0.548	N.A.	1.071	Y	0.550	6.2	0.8	11.4	0.9997	6.38	0.3766	3.73
33	7.36	0.120	61.3	0.881	20.35	0.7	389	1.89	4.08	0.333	23.67	11.2	0.098	0.555	N.A.	1.069	Y	0.560	5.6	0.8	12.0	0.9933	6.71	0.3735	3.34
34	7.5	0.120	62.5	0.870	20.10	0.7	389	1.89	4.15	0.343	24.53	11.8	0.099	0.562	N.A.	1.068	Y	0.571	5.0	0.8	12.6	0.9872	7.05	0.3705	2.97
35	7.64	0.120	63.7	0.859	19.85	0.7	389	1.89	4.23	0.353	25.41	12.4	0.100	0.568	N.A.	1.066	Y	0.582	4.4	0.8	13.2	0.9814	7.40	0.3675	2.63
36	7.78	0.120	64.8	0.849	19.61	0.7	389	1.89	4.31	0.363	26.30	12.9	0.101	0.574	N.A.	1.065	Y	0.592	3.9	0.8	13.8	0.9757	7.75	0.3645	2.30
37	7.92	0.120	66.0	0.849	19.61	0.7	389	1.89	4.39	0.373	27.21	13.5	0.102	0.580	N.A.	1.063	Y	0.603	3.4	0.9	14.4	0.9702	8.12	0.3616	2.00
38	8.06	0.120	67.2	0.849	19.61	0.7	389	1.89	4.47	0.383	28.13	14.1	0.103	0.585	N.A.	1.062	Y	0.614	2.9	0.9	15.0	0.965	8.50	0.3588	1.72
39	8.2	0.120	68.3	0.849	19.61	0.7	389	1.89	4.55	0.394	29.07	14.8	0.104	0.591	N.A.	1.060	Y	0.626	2.5	0.9	15.7	0.9599	8.89	0.3561	1.47
40	8.34	0.120	69.5	0.849	19.61	0.7	389	1.89	4.63	0.425	30.02	15.5	0.110	0.600	N.A.	1.059	Y	0.762	2.1	0.9	16.4	0.955	9.29	0.3538	1.23
41	8.48	0.120	70.7	0.849	19.61	0.7	389	1.89	4.71	0.436	30.99	16.2	0.111	0.609	N.A.	1.057	Y	0.774	1.7	0.9	17.1	0.9502	9.72	0.3519	1.01
42	8.62	0.120	71.8	0.849	19.61	0.7	389	1.89	4.79	0.447	31.97	17.0	0.112	0.617	N.A.	1.055	Y	0.786	1.4	0.9	17.9	0.9456	10.16	0.35	0.82
43	8.76	0.120	73.0	0.849	19.61	0.7	389	1.89	4.86	0.458	32.97	17.8	0.113	0.625	N.A.	1.053	Y	0.798	1.1	1.0	18.7	0.9411	10.61	0.3481	0.65
44	8.9	0.120	74.2	0.849	19.61	0.7	389	1.89	4.94	0.469	33.99	18.6	0.114	0.633	N.A.	1.052	Y	0.810	0.8	1.0	19.6	0.9368	11.07	0.3462	0.49
45	9.04	0.120	75.3	0.849	19.61	0.7	389	1.89	5.02	0.481	35.01	19.4	0.115	0.640	N.A.	1.050	Y	0.823	0.6	1.0	20.4	0.9326	11.55	0.3443	0.36
46	9.18	0.120	76.5	0.849	19.61	0.7	389	1.89	5.10	0.493	36.06	20.2	0.116	0.647	N.A.	1.049	Y	0.835	0.4	1.0	21.2	0.9286	12.04	0.3425	0.25
47	9.32	0.120	77.7	0.849	19.61	0.7	389	1.89	5.18	0.505	37.12	21.1	0.117	0.653	N.A.	1.047	Y	0.848	0.3	1.0	22.1	0.9246	12.53	0.3406	0.16
48	9.46	0.120	78.8	0.849	19.61	0.7	389	1.89	5.26	0.517	38.19	21.9	0.118	0.660	N.A.	1.045	Y	0.861	0.2	1.0	22.9	0.9208	13.05	0.3388	0.09
49	9.6	0.120	80.0	0.849	19.61	0.7	389	1.89	5.34	0.529	39.28	22.8	0.119	0.666	N.A.	1.044	NA	0.875	0.1	1.0	23.8	0.9171	13.57	0.337	0.04
50	9.74	0.120	81.2	0.849	19.61	0.7	389	1.89	5.42	0.542	40.39	23.7	0.120	0.672	N.A.	1.042	NA	0.888	0.0	1.0	24.7	0.9135	14.10	0.3353	0.01
51	9.88	0.120	82.3	0.849	19.61	0.7	389	1.89	5.49	0.563	41.51	24.6	0.123	0.678	N.A.	1.041	NA	0.902	0.0	1.0	25.6	0.91	14.65	0	0.00

Reference: 2022 CBC, ASCE 7-16

INPUT:

Job Location:	Costa Mesa, CA		
Site Class	D-Default		ASCE
0.2 Sec MCE, Ss	1.312	g	ASCE
1.0 Sec MCE, S_1	0.469	g	ASCE
Site Coeff., F_a	1.200		ASCE
Site Coeff., F_v	1.831		ASCE
$S_{MS} = F_a S_S$	1.574	g	ASCE
$S_{M1} = Fv S_1$	0.859	g	ASCE
$S_{DS} = 2/3 S_{MS}$	1.050	g	ASCE
$S_{D1} = 2/3 S_{M1}$	0.572	g	ASCE
$Ts = S_{D1}/S_{DS}$	0.545	sec	
Long Period transition period, T_L	8.0	sec	ASCE 7-16 -Figure 22-12
Risk Category	II		Table 1604.5
Seismic Design Category	D		2022 CBC Section 1613.3.5

OUTPUT:

Light Pole Class	LS50-A		
Fundamental Period, T	1.69	sec	1/Pole Natural Frequency
Seismic coeff., R	1.5		ASCE 7-16 Table 15.4-2
Overstrength Factor, Ω	1.5		ASCE 7-16 Table 15.4-2
Importance Factor, I	1.00		ASCE 7-16 Section 15.4.1.1 & Table 1.5-2
Redundancy factor, ρ	1.0		ASCE 7-16 Section 15.6
DESIGN SEISMIC FORCE			
$V = C_S W$			ASCE 7-16 Eqn. 12.8-1
$C_S = S_{DS}/(R/I)$ for $T \le T_S$	0.700	g	ASCE 7-16 Eqn. 12.8-2
Cs max. for $1.5Ts < T \le TL$, $Cs = 1.5\ SD1/T(R/I)$	0.339	g	ASCE 7-16 Sect. 11.4.8 & Eqn. 12.8-3
C_S min $= 0.044 S_{DS} I \ge 0.03$	0.046	g	ASCE 7-16 Eqn. 15.4-1
if $S_1 \ge 0.6g$, C_S min $= 0.8 S_1/(R/I)$	N.A.	g	ASCE 7-16 Eqn. 15.4-2
Load Combination, 1.2D+ 1.0E			ASCE 7-16 Section 2.3.2 Load Comb 5
where E = Eh + Ev			ASCE 7-16 Eqn. 12.4-1
and $Eh = pQ_E$	0.339	W	ASCE 7-16 Eqn. 12.4-3
and $Ev = 0.2 S_{DS} D$	0.210	D	ASCE 7-16 Eqn. 12.4-4

Load Combination, 1.2D + (pQe + $0.2S_{DS}$D)

Load Combination, 1.2D + (pQe + $0.2S_{DS}$D)	1.410	D	+	0.339	W

Total Seismic Weight, W = 0.785 kips See following page

SEISMIC SHEAR, V =	0.348	kips	<	0.900	kips WIND SHEAR	WIND CONTROLS

Vertical Distribution of Seismic Force, F_x = $C_{vx}V$ ASCE7-16 Eqn. 12.8-11 & Section 12.8.5

k= 1.594

Item	w	h_x	$w_x h_x^k$	$w_x h_x^k / \sum w_x h_x^k$	Cvx*V	OTM
fixtures	0.101	49.50	51	0.374	0.100	4.93
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
Top Pole Section	0.098	45.00	42	0.312	0.083	3.74
			0	0.000	0.000	0.00
1st Pole Section	0.325	19.00	35	0.262	0.070	1.32
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
ECE	0.020	15.00	1	0.011	0.003	0.04
1/2 Precast base above grade	0.241	7.17	6	0.041	0.011	0.08
Sum	0.785		136	1.000	0.266	10.12
Total Dead Load at grade	1.026					

Seismic Overturning Moment, M = 10.12 kip-ft < 25.48 kip-ft Wind OTM WIND CONTROLS

engineer: CLC
design: Musco Pole Design 1B

Pole Calcuations - Page 1

ACI 318-14

Inputs

Pole Type	1B		f_{py} =	230.0 ksi	Strand Yield Strength
D_o =	9.48 in	Outer Diameter	f_{pu} =	270.0 ksi	Strand Ultimate Strength
D_i =	4.25 in	Inner Diameter	f'_c =	9.5 ksi	28 Day Strength of Concrete
D_{tc} =	6.625 in	Diameter of Tendon Circle	E_s =	29000.0 ksi	Elastic Modulus of Strand
d_t =	0.6 in	Strand Diameter	IPF =	0.41	Initial Prestress Factor
n =	6	Number of Tendons	PLF =	0.82	Prestress Loss Factor
A_{ps} =	0.217 in²	Area of Single Strand	a =	2.73 in	
Φ =	0.90	Resistance Factor	c =	4.19 in	
$ß_1$ =	0.65	$f'_c \geq 8$ ksi			

Determine Concrete Compression Forces (Bending Only)

Calculate the Properties of the Compression Zone

A. Calculate the Section Properties based on Outer Radius (Note: These Calculations Assume there is no core in the pole)

$c_o = D_o/3$ = 3.16 in — Initial Guess

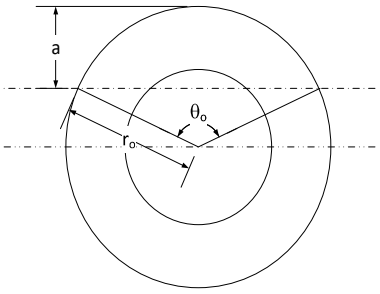
$r_o = D_o/2$ = 4.74 in

$\Theta_o = 2 * \cos^{-1}((r_o - a)/r_o)$ = 2.26

$I_o = r_o^4/8 * \Theta_o - \sin(\Theta_o) + (2*\sin(\Theta_o)*\sin(\Theta_o/2)^2)$ = 173.8 in^4

$A_o = (r_o^2*\cos^{-1}*(r_o-a)/r_o) - ((r_o-a)*\sqrt{(2*r_o*a)-a^2})$ = 16.78 in²

$y_{ro} = (4*r_o*\sin(\Theta_o/2)^3)/(3*(\Theta_o-\sin(\Theta_o)))$ = 3.14 in



B. Calculate the Section Properties based on Inner Radius (Note: These Calculations Assume there is no core in the pole)

$r_i = D_i/2$ = 2.13 in

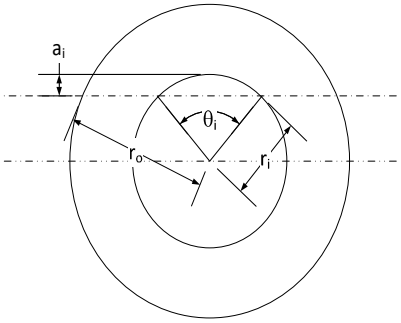
a_i = 0.11 in

$\Theta_i = 2 * \cos^{-1}((r_i - a_i)/r_i)$ = 0.65

$I_i = r_i^4/8 * \Theta_i - \sin(\Theta_i) + (2*\sin(\Theta_i)*\sin(\Theta_i/2)^2)$ = 0.4 in^4

$A_i = (r_i^2*\cos^{-1}*(r_i-a)/r_i) - ((r_i-a)*\sqrt{(2*r_i*a)-a^2})$ = 0.1 in²

$y_{ri} = (4*r_i*\sin(\Theta_i/2)^3)/(3*(\Theta_i-\sin(\Theta_i)))$ = 2.06 in



Note: If the inner raidius is outside the compression zone, I_i & A_i will be set to 0

Conclusion

A Calculate the Combined Section Properties:

$A_c = A_o - A_i$ = 16.7 in² — Area of the Compression Zone

$I_c = I_o - (I_i + A_i + y_{ri}^2)$ = 169.1 in^4 — Mass Moment of Intertia of Combined Section

$y = (A_o*y_o - A_i*y_i) / A_c$ = 3.14 in — Centroid for the Combined Arc Section

$y_c = c + r_o + y$ = 2.60 in — Centroid for the Effective Compression Area

$A' = \pi*(r_o^2 - r_i^2) - A_c$ = 39.7 in² — Area of the Tension Zone with the Strand Included

engineer: CLC
design: Musco Pole Design 1B

Pole Calcuations - Page 2

Determine Concrete Compression Forces (Bending Only)

Conclusion Continued

B. Compute the Effective Compression Area

Note: Then number of strands in compression (N_c) is determinde by the results of the calculations in the Tendon Strain Table.

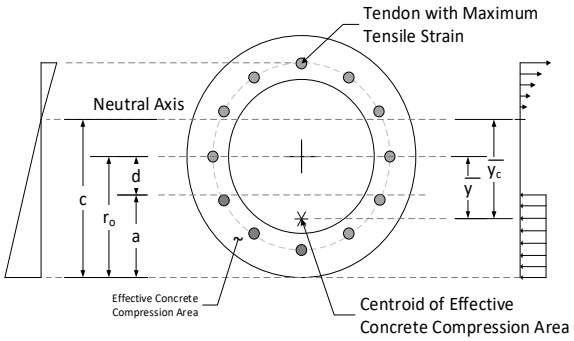
$A_{pscomp} = N_c * A_{ps} =$ 0.22 in²

Effective Area of Concrete in Compression

$A_e = A_c - A_{pscomp} =$ 16.47 in²

C. Compute the Compression Force

$F_c = A_e * 0.85 * f'_c =$ 133.0 kip



Determine Steel Tensile Forces

Calculate the Total Prestressing Force.

$f_{se} = IPF * PLF * f_{pu} =$	90.8 ksi	Total Prestressing Stress
$\varepsilon_{se} = f_{se}/E_s =$	0.0031	Prestressing Strain
$f_{py}/E_s =$	0.0079	Maximum Tendon Yield Strain
$F_{ps} = \varepsilon_{se} * A_{st} * E_s =$	19.7	Force in Single Prestress Strand
$F_t = \Sigma$ Line Forces =	133.0 kip	From the Tension Line Table

Converge the Forces to Achieve a Balance Condition

c =	4.19 in
$F_c - F_t =$	0 kip

Converge the Forces to Achieve a Balance C 0

A. Compressive Force Moment

$M_{cf} = (F_c * y_c)/(12*in/ft) =$ 28.8 k*ft

B. Tension Force Moment

$M_t = \Sigma M_{ti} =$ 18.4 k*ft Sum of Moments in the Tendon Line Table

Calculate Ultimate Moment Capacity

Extreme Tensile Strain =	0.0028	Within Transition Zone
$M_n = M_{cf} + M_t =$	47.2 kip*ft	
$M_a = \Phi M_n =$	**42.5 kip*ft**	
$M_{cr} =$	**18.9 kip*ft**	Cracking Moment (See Page 3)

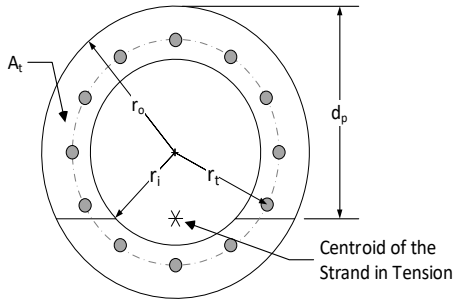
Calculate Development Length

$f_{se} =$	90.8 ksi	
$f_{py} / f_{pu} =$	0.85	
$\gamma_p =$	0.40	
Approximate $f_{ps} = (1-(\gamma_p * \rho * f_{pu}))/(f'_c * ß_1) * f_{pu} =$	108.3 ksi	ACI 318-14 Eqn 20.3.2.3.1
$L_d = (f_{se}/3000) * d_b + (f_{ps}-f_{se})/1000 * d_b =$	28.7 in	ACI 318-14 Eqn 25.4.8.1

engineer: CLC
design: Musco Pole Design 1B

Pole Calcuations - Page 3

Calculation of Mcr and Other Properties



$n_t = n - n_c = 5$

d_p = Σ Elevations of Tendons in Tension/n_t = 5.40 in

Distance from Centroid of Tension Steel to Center of Pole

$d = d_p - r_o = 0.66$ in

$b_o = D_o - d_p = 4.08$ in

Area of the Outer Region Determined by b_o

$A_{co}' = r_o^2 * \cos^{-1}((r_o-b_o)/r_o) - ((r_o-b_o)*\sqrt{((2*r_o*b_o)-r_o^2)}) = 29.0$ in²

Area of the Outer Region Determined by b_i

$b_i = b_o - (r_o - r_i) = 1.46$ in

$A_{ci}' = r_i^2 * \cos{-1}((r_i-b_i)/r_i) - ((r_i-b_i)*\sqrt{((2*r_i*b_i)-r_i^2)}) = 4.3$ in²

$A'' = A_{co}' - A_{ci}' = 24.7$ in²

$A_{tot} = \pi*(r_o^2-r_i^2) = 56.4$ in² Total Concrete Area

$b_{dp} = A_t = A_{tot} - A'' = 31.7$ in²

$f_r = 7.5*\sqrt{f'_c} = 731.0$ psi Modulus of Rupture

$f_{pe} = n*A_{ps}*f_{se}/A_{tot} = 2095.6$ psi

$I_g = \pi/4 * ((D_o)^4-(D_i)^4) = 380.449$ in Moment of Inertia of Gross Section

$M_{cr} = (f_r+f_{pe})/A_t*(I_g/r_o) = 18.9$ k*in Cracking Moment (ACI 318-14 24.2.3.9)

$\rho = 0.0342$ Reinforcement Ratio

6655 Wedgwood Road, Ste 130 Maple Grove, MN 55311
RinkerPipe.com

project:
project number:
engineer: CLC
design: Musco Pole Design 1B

Pole Calcuations - Tendon Line Tension Table

ACI 318-14

n_t = 6 Number of Tendons

E = 29000 ksi Modulus of Elasticity

A_{ps} = 0.217 in² Area of a Strand

c = 4.19 in

LINE n	LINE STRAIN $S(e_b + \varepsilon_{se})$	fps (KSI)	FORCE (KIPS)	MOMENT (FT-KIPS)
1	0.0059	170.86	37.0776	11.93
2	0.0094	272.99	59.2398	10.88
3	0.0047	135.52	29.4088	-2.72
4	0.0012	33.39	7.2467	-1.67
5	0.0000	0.00	0.0000	0.00
6	0.0000	0.00	0.0000	0.00
7	0.0000	0.00	0.0000	0.00
8	0.0000	0.00	0.0000	0.00
9	0.0000	0.00	0.0000	0.00
10	0.0000	0.00	0.0000	0.00
11	0.0000	0.00	0.0000	0.00
12	0.0000	0.00	0.0000	0.00
13	0.0000	0.00	0.0000	0.00
14	0.0000	0.00	0.0000	0.00
15	0.0000	0.00	0.0000	0.00
16	0.0000	0.00	0.0000	0.00
17	0.0000	0.00	0.0000	0.00
18	0.0000	0.00	0.0000	0.00
19	0.0000	0.00	0.0000	0.00
20	0.0000	0.00	0.0000	0.00
21	0.0000	0.00	0.0000	0.00
22	0.0000	0.00	0.0000	0.00
23	0.0000	0.00	0.0000	0.00
24	0.0000	0.00	0.0000	0.00
25	0.0000	0.00	0.0000	0.00
26	0.0000	0.00	0.0000	0.00
	Σ =	612.78	132.97	18.42

project:
project number:
engineer: CLC
design: Musco Pole Design 1B

Pole Calcuations - Tendon Line Tension Table

ACI 318-14

n_t =	6	Number of Tendons	c =	4.19 in	From Iteration
r_o =	4.74 in	Outer Radius	ε_{se} =	0.0031	Prestressing Strain
D_{tc} =	6.625	Diameter of Tendon Circle	ε_{smax} =	0.0079	Maximum Tendon Yield Strain
a =	2.73 in	ß1 * c			

TENDON #	ANGLE (FROM VERT) (RADIANS)	ANGLE (FROM VERT) (DEGREES)	TENDON ELEV. (INCHES) (FROM COMP. SIDE)	BENDING STRAIN ε_b	TOTAL STRAIN $\varepsilon_b + e_{se}$	TENDON w/in COMP. BLOCK? (Y = 1, N = 0)	TENDON ELEV. TO THOSE IN TEN. (FROM COMP. SIDE)
1	0.00	0	8.05	0.0028	0.0059	0	8.0525
2	1.05	60	6.40	0.0016	0.0047	0	6.40
3	2.09	120	3.08	-0.0008	0.0023	0	3.08
4	3.14	180	1.43	-0.0020	0.0012	1	0.00
5	4.19	240	3.08	-0.0008	0.0023	0	3.08
6	5.24	300	6.40	0.0016	0.0047	0	6.40
7	NA	NA	NA	NA	NA	0	0.00
8	NA	NA	NA	NA	NA	0	0.00
9	NA	NA	NA	NA	NA	0	0.00
10	NA	NA	NA	NA	NA	0	0.00
11	NA	NA	NA	NA	NA	0	0.00
12	NA	NA	NA	NA	NA	0	0.00
13	NA	NA	NA	NA	NA	0	0.00
14	NA	NA	NA	NA	NA	0	0.00
15	NA	NA	NA	NA	NA	0	0.00
16	NA	NA	NA	NA	NA	0	0.00
17	NA	NA	NA	NA	NA	0	0.00
18	NA	NA	NA	NA	NA	0	0.00
19	NA	NA	NA	NA	NA	0	0.00
20	NA	NA	NA	NA	NA	0	0.00
21	NA	NA	NA	NA	NA	0	0.00
22	NA	NA	NA	NA	NA	0	0.00
23	NA	NA	NA	NA	NA	0	0.00
24	NA	NA	NA	NA	NA	0	0.00
25	NA	NA	NA	NA	NA	0	0.00
26	NA	NA	NA	NA	NA	0	0.00
						Σ = 1	27.01 in

ATTACHMENT 2

KNA STRUCTURAL ENGINEERS

POLE DESIGNATION: LS50-AB W/ 8 FIXTURES MAX.
MANUFACTURER: MUSCO
PROJECT NO: 215837

JOB NO: 463.358
PROJECT: Tewinkle Park Tennis
LOCATION: Costa Mesa, CA

ASCE 7-16
WIND CRITERIA 95 MPH,EXP C
LOAD COMB 1.2 DEAD + 1.0 WIND

POLE ID: T6
(T2, T3, T5, T7, T10, T12, T13 Sim.)

LED **550**

EPA/FIXTURE*, Af	=	1.78	ft2
D.L./FIXTURE**	=	52.8	lbs
D.L. ECE/FIXTURE***	=	10.0	lbs

* EPA = EFFECTIVE PROJECTED AREA OF LIGHT FIXTURE INCLUDING CROSSARM, PER MUSCO
** D.L.= DEAD LOAD OF FIXTURE, & CROSSARM, PER MUSCO
*** D.L.= DEAD LOAD OF ECE, PER MUSCO

P = SUPERIMPOSED WT + POLE WT					
v					
^ |||a	<--	<--FIXTURES, F/Af= qz*Gf*Cf =	30.56	PSF MAX	*(29.4-1)*
| |v|	<--	<--where qz=.00256*Kz*Kzt*Kd*Ke(V)^2 =	25.22	PSF MAX	*(26.10-1)*
| |||	<--	<---			

ATTACHMENT TYPE	NUMBER	DIST. FROM TOP POLE,FT	PA SQ FT	Cf	EPA SQ FT	Kz	qz PSF	WIND,F LBS	WEIGHT,P LBS
LED550	4.0	0.5		1.0	1.78	1.089	25.17	217	211
LED550	4.0	0.5		1.0	1.78	1.089	25.17	217	211
	0.0	5.5		1.3	1.78	1.065	24.61	0	0
	0.0	8.0		1.3	1.78	1.052	24.31	0	0
	0.0	10.5		1.3	1.78	1.038	23.99	0	0
	0.0	13.0		1.3	1.78	1.024	23.66	0	0
	0.0	15.5		1.3	1.78	1.009	23.31	0	0
	0.0	18.0		1.3	1.78	0.993	22.94	0	0
	0.0	20.5		1.0	1.78	0.976	22.54	0	0
	0.0	23.0		1.0	1.78	0.957	22.12	0	0
ECE	8.0	37.9	9.00	1.3	11.70	0.849	19.61	278	80
							TOTALS =	712	502

| |v|	<--				
| |||	<--				
| |v|	<--				
| |||	<--				
| |v|	<--				
| |||	<--				
| |v|	<--				
| |||	<--				
| |v|	<--				
| |||	<--				
| |v|	<--				
v | |b	<--				
		POLE, F/Af= qz*Gf*Cf =	21.39	PSF MAX	*(29.4-1)*
		where qz=.00256*Kz*Kzt*Kd*Ke(V)^2 =	25.22	PSF MAX	*(26.10-1)*

LOADING DIAGRAM

INPUT

-> l =	49.57	ft. (ht. from adj. grade)	
-> l =	49.57	ft. (ht. from grade)	
->tA =	0.12	in. (pole thk. @ top)	
->dA =	6.00	in. (pole diam. @ top)	
->dB =	11.93	in. (pole diam. @ btm)	
->tB =	0.142	in. (pole thk. @ btm)	
->Fy =	38.0	ksi (fixt mount sect. =	5.25 ft)
->Fy =	55.0	ksi (other pole sect.)	
-> E =	29,000	ksi	
->Kzt=	1	*(Figure 26.8-1)*	
->Kd =	1	*(Table 26.6-1)*	
-> Kz =	1.092	MAX-EXP C @ 49.6 FT.	*(Table 26.10-1)*
->Ke =	1.00		*(Table 26.9-1)*
-> Cf =	1.00	LIGHT FIXTURE (INCLUDED IN EPA)	
-> Cf =	0.700	MAX (VARIES 0.5-1.2 FOR RND POLE)	*(Figure 29.4-1)*

POLE DAMPING, beta= 0.025 *Per Musco test*

OUTPUT

-> POLE NATURAL FREQUENCY = 0.617 Hz *1/(2PI*(DELTA/386)^0.5) where DELTA is due to self weight*
-> Gf= 1.21 *(Section 26.11.5)* *(Reference Vibration Problems in Engineering by Timoshenko, 4th ED. pg.34)*

Pole Properties:

Ia =	9.58	in4	taper =	0.140	in/ft
Ib =	91	in4	db/da =	1.988	
ra =	2.079	in	rb =	4.166	in.
Aa =	2.217	in2	Ab =	5.26	in2
Sa =	3.19	in3	Sb =	15.30	in3

From Critical Buckling Loads of Tapered Columns, ASCE 2/62:

n =	Log (Ib/(Ia)/Log (dB/dA) =	3.28	
P* =	(Ib/Ia)/(Ib/Ia)^.333 =	4.5	
kl/req*	(1/(P*)^.5)[kl/ra] =	283	(where k= 2.1)

AISC 360-16 Specification Table B4.1, Case 15

	for Fy =	55.0 KSI	38 KSI
D/t < .45E/Fy =	237	343	(MAX)
D/t < .31E/Fy =	163	237	Noncompact
D/t < .07E/Fy =	37	53	Compact
D/t < .11E/Fy =	58	84	Slender element Section for Uniform Compression

Section 26.11.5 Gust-Effect Factor

constant epsilon,e =		0.2	Lz	=	489.7
constant l	=	500	N1	=	3.391
Vz	=	89.13	Rn	=	0.065
4.6n1h/Vz	=	1.579			
4.6n1B/Vz	=	0.024	R	=	1.048
15.4n1L/Vz	=	0.080	g_R	=	4.073
			c	=	0.200
Rh	=	0.441	Iz	=	0.203
RB	=	0.984	Q	=	0.932
RL	=	0.949	G	=	0.891
		Gf =	1.211		

SHEAR,F=	0.832	*KIPS*	MOMENT, M =	25.17	*K-FT*	e= M/F =	30.24	*FT* AXIAL,P =	1.136 *KIPS*	**ASD Forces at groundline (for foundation design)**
SHEAR,F=	1.387	*KIPS*	MOMENT, M =	41.95	*K-FT*	e= M/F =	30.24	*FT* AXIAL,P =	1.363 *KIPS*	**Nominal Forces at groundline**

M < ΦMn = 82 K-FT Precast Base O.K.

Pole Stress Check = 0.574 Max. < 1 Pole O.K.

Max. Deflection = 28.835 Inch <0.10H= 59 Inch AASHTO 10.4.2

ATTACHMENT 2

Distance from top of Pole FT	Outside Diameter of Pole,D IN	Pole thick,t IN	D/t	Kz	qz PSF	Cf Pole	kl/r eqiv.	E3-4 Fe	E3-2 or E3-3 Design comp strength, Pn KIPS	Acting unfactored, Pr KIPS	F8.1-F8.4 Design flex. strength, Mn K-FT	Req'd flex. strength, Mr K-FT	Pr/Pc	H1-1b for Pr/Pc <0.2	H1-1a for Pr/Pc ≥ 0.2	2nd Order /1st Order Moment FT-K	CSR O.K.	Req'd shear strength,, F KIPS	1st Order Delta IN	C2.2a P-Delta Moment FT-K	Total 2nd Order Moment FT-K	E7-4 Q	ACTING MOM DUE TO DL	M/I	DEFL DUE TO DL IN
0	6.00	0.120	50.0	1.092	25.22	0.7	283	3.56	6.23	0.000	12.02	0.0	0.000	0.000	N.A.	1.000	Y	0.000	28.8	0.0	0.0	1.2467	0.00	0.0002	25.67
1	6.10	0.120	50.8	1.087	25.12	0.7	283	3.56	6.34	0.430	12.38	0.2	0.081	0.062	N.A.	1.198	Y	0.445	27.8	0.0	0.3	1.2375	0.00	0.0209	24.75
2	6.19	0.120	51.6	1.082	25.01	0.7	283	3.56	6.44	0.438	12.73	0.7	0.082	0.101	N.A.	1.132	Y	0.456	26.8	0.1	0.8	1.2286	0.44	0.0605	23.84
3	6.29	0.120	52.4	1.078	24.89	0.7	283	3.56	6.54	0.446	13.10	1.1	0.082	0.138	N.A.	1.119	Y	0.467	25.8	0.1	1.3	1.2201	0.88	0.0971	22.92
4	6.38	0.120	53.2	1.073	24.78	0.7	283	3.56	6.64	0.454	13.46	1.6	0.082	0.174	N.A.	1.113	Y	0.478	24.7	0.2	1.8	1.2117	1.33	0.131	22.02
5	6.48	0.120	54.0	1.068	24.67	0.7	283	3.56	6.74	0.462	13.84	2.1	0.082	0.209	N.A.	1.109	Y	0.489	23.7	0.2	2.3	1.2036	1.79	0.1676	21.11
6	6.46	0.120	53.8	1.063	24.55	0.7	283	3.56	6.72	0.470	18.48	2.6	0.084	0.197	N.A.	1.106	Y	0.500	22.7	0.3	2.9	1.0391	2.25	0.2005	20.22
7	6.60	0.120	55.0	1.057	24.43	0.7	283	3.56	6.87	0.479	19.24	3.1	0.084	0.219	N.A.	1.104	Y	0.512	21.8	0.3	3.4	1.0312	2.73	0.2242	19.34
8	6.73	0.120	56.1	1.052	24.31	0.7	283	3.56	7.01	0.487	20.01	3.6	0.083	0.240	N.A.	1.102	Y	0.523	20.8	0.4	4.0	1.0237	3.21	0.2452	18.47
9	6.87	0.120	57.3	1.047	24.18	0.7	283	3.56	7.16	0.496	20.80	4.1	0.083	0.261	N.A.	1.101	Y	0.535	19.8	0.4	4.6	1.0165	3.70	0.2637	17.62
10	7.01	0.120	58.4	1.041	24.06	0.7	283	3.56	7.31	0.505	21.60	4.7	0.083	0.280	N.A.	1.099	Y	0.546	18.9	0.5	5.1	1.0096	4.20	0.28	16.78
11	7.15	0.120	59.6	1.036	23.93	0.7	283	3.56	7.45	0.515	22.41	5.2	0.083	0.298	N.A.	1.098	Y	0.558	18.0	0.5	5.7	1.0029	4.71	0.2944	15.96
12	7.29	0.120	60.8	1.030	23.79	0.7	283	3.56	7.60	0.524	23.25	5.8	0.083	0.315	N.A.	1.096	Y	0.571	17.1	0.6	6.4	0.9965	5.23	0.3071	15.15
13	7.43	0.120	61.9	1.024	23.66	0.7	283	3.56	7.75	0.533	24.09	6.4	0.083	0.331	N.A.	1.095	Y	0.583	16.2	0.6	7.0	0.9903	5.76	0.3182	14.36
14	7.57	0.120	63.1	1.018	23.52	0.7	283	3.56	7.90	0.543	24.96	7.0	0.083	0.346	N.A.	1.094	Y	0.595	15.3	0.7	7.6	0.9844	6.30	0.3281	13.59
15	7.71	0.120	64.2	1.012	23.38	0.7	283	3.56	8.04	0.553	25.83	7.6	0.083	0.361	N.A.	1.092	Y	0.608	14.5	0.7	8.3	0.9786	6.85	0.3367	12.84
16	7.85	0.120	65.4	1.006	23.24	0.7	283	3.56	8.19	0.563	26.73	8.2	0.083	0.375	N.A.	1.091	Y	0.621	13.7	0.7	8.9	0.9731	7.41	0.3442	12.11
17	7.98	0.120	66.5	0.999	23.09	0.7	283	3.56	8.34	0.573	27.63	8.8	0.083	0.388	N.A.	1.090	Y	0.634	12.9	0.8	9.6	0.9678	7.97	0.3508	11.40
18	8.12	0.120	67.7	0.993	22.94	0.7	283	3.56	8.49	0.584	28.56	9.4	0.083	0.401	N.A.	1.088	Y	0.647	12.1	0.8	10.3	0.9626	8.55	0.3566	10.72
19	8.26	0.120	68.9	0.986	22.78	0.7	283	3.56	8.63	0.595	29.49	10.1	0.083	0.413	N.A.	1.087	Y	0.660	11.4	0.9	11.0	0.9577	9.14	0.3616	10.05
20	8.40	0.120	70.0	0.979	22.62	0.7	283	3.56	8.78	0.605	30.44	10.8	0.083	0.425	N.A.	1.086	Y	0.673	10.6	0.9	11.7	0.9529	9.74	0.3659	9.40
21	8.54	0.120	71.2	0.972	22.46	0.7	283	3.56	8.93	0.616	31.41	11.4	0.083	0.436	N.A.	1.084	Y	0.687	9.9	1.0	12.4	0.9482	10.35	0.3696	8.78
22	8.68	0.120	72.3	0.965	22.29	0.7	283	3.56	9.08	0.627	32.39	12.1	0.083	0.447	N.A.	1.083	Y	0.700	9.3	1.0	13.1	0.9437	10.97	0.3727	8.17
23	8.82	0.120	73.5	0.957	22.12	0.7	283	3.56	9.22	0.639	33.39	12.8	0.083	0.458	N.A.	1.082	Y	0.714	8.6	1.1	13.9	0.9393	11.61	0.3754	7.59
24	8.96	0.120	74.6	0.950	21.94	0.7	283	3.56	9.37	0.650	34.40	13.6	0.083	0.468	N.A.	1.080	Y	0.728	8.0	1.1	14.7	0.9351	12.25	0.3777	7.03
25	9.10	0.120	75.8	0.942	21.76	0.7	283	3.56	9.52	0.662	35.43	14.3	0.083	0.477	N.A.	1.079	Y	0.742	7.4	1.1	15.4	0.931	12.91	0.3795	6.50
26	9.23	0.120	77.0	0.934	21.57	0.7	283	3.56	9.66	0.674	36.47	15.0	0.084	0.486	N.A.	1.078	Y	0.756	6.8	1.2	16.2	0.927	13.58	0.381	5.98
27	9.37	0.120	78.1	0.925	21.37	0.7	283	3.56	9.81	0.688	37.53	15.8	0.084	0.496	N.A.	1.076	Y	0.770	6.2	1.2	17.0	0.9232	14.25	0.3666	5.49
28	9.28	0.142	65.3	0.916	21.17	0.7	283	3.56	11.46	0.702	44.23	16.6	0.073	0.440	N.A.	1.075	Y	0.784	5.7	1.2	17.8	0.9733	14.95	0.3516	5.02
29	9.42	0.142	66.3	0.907	20.96	0.7	283	3.56	11.64	0.716	45.51	17.4	0.074	0.447	N.A.	1.074	Y	0.797	5.2	1.3	18.7	0.9688	15.66	0.3518	4.58
30	9.56	0.142	67.3	0.898	20.74	0.7	283	3.56	11.81	0.731	46.80	18.2	0.074	0.454	N.A.	1.072	Y	0.811	4.7	1.3	19.5	0.9643	16.38	0.3518	4.15
31	9.70	0.142	68.3	0.888	20.51	0.7	283	3.56	11.99	0.745	48.12	19.0	0.075	0.460	N.A.	1.071	Y	0.825	4.3	1.4	20.4	0.96	17.12	0.3516	3.74
32	9.84	0.142	69.3	0.878	20.28	0.7	283	3.56	12.17	0.760	49.45	19.8	0.075	0.467	N.A.	1.070	Y	0.839	3.8	1.4	21.2	0.9559	17.87	0.3514	3.36
33	9.98	0.142	70.3	0.867	20.03	0.7	283	3.56	12.34	0.775	50.80	20.7	0.075	0.473	N.A.	1.068	Y	0.853	3.4	1.4	22.1	0.9518	18.64	0.351	3.00
34	10.12	0.142	71.3	0.856	19.77	0.7	283	3.56	12.52	0.791	52.17	21.5	0.076	0.479	N.A.	1.067	Y	0.867	3.0	1.4	23.0	0.9479	19.42	0.3505	2.65
35	10.26	0.142	72.2	0.849	19.61	0.7	283	3.56	12.69	0.806	53.55	22.4	0.076	0.484	N.A.	1.066	Y	0.881	2.7	1.5	23.9	0.944	20.22	0.3499	2.33
36	10.40	0.142	73.2	0.849	19.61	0.7	283	3.56	12.87	0.822	54.96	23.3	0.077	0.490	N.A.	1.065	Y	0.896	2.3	1.5	24.8	0.9403	21.04	0.3493	2.03
37	10.54	0.142	74.2	0.849	19.61	0.7	283	3.56	13.04	0.838	56.38	24.2	0.077	0.495	N.A.	1.063	Y	0.910	2.0	1.5	25.7	0.9367	21.87	0.3486	1.75
38	10.68	0.142	75.2	0.849	19.61	0.7	283	3.56	13.22	0.934	57.82	25.3	0.085	0.506	N.A.	1.062	Y	1.203	1.7	1.6	26.8	0.9331	22.71	0.3484	1.49
39	10.82	0.142	76.2	0.849	19.61	0.7	283	3.56	13.39	0.951	59.28	26.5	0.085	0.516	N.A.	1.060	Y	1.218	1.4	1.6	28.1	0.9297	23.65	0.3487	1.25
40	10.96	0.142	77.2	0.849	19.61	0.7	283	3.56	13.57	0.967	60.75	27.7	0.086	0.525	N.A.	1.058	Y	1.233	1.2	1.6	29.3	0.9263	24.61	0.3488	1.04
41	11.10	0.142	78.2	0.849	19.61	0.7	283	3.56	13.75	0.984	62.25	28.9	0.086	0.534	N.A.	1.056	Y	1.248	1.0	1.6	30.6	0.923	25.59	0.3489	0.84
42	11.24	0.142	79.1	0.849	19.61	0.7	283	3.56	13.92	1.001	63.76	30.2	0.086	0.543	N.A.	1.055	Y	1.264	0.8	1.7	31.8	0.9198	26.58	0.3488	0.66
43	11.38	0.142	80.1	0.849	19.61	0.7	283	3.56	14.10	1.019	65.29	31.5	0.087	0.551	N.A.	1.053	Y	1.279	0.6	1.7	33.1	0.9167	27.59	0.3487	0.51
44	11.52	0.142	81.1	0.849	19.61	0.7	283	3.56	14.27	1.036	66.84	32.8	0.087	0.559	N.A.	1.051	Y	1.295	0.4	1.7	34.4	0.9137	28.62	0.3484	0.37
45	11.66	0.142	82.1	0.849	19.61	0.7	283	3.56	14.45	1.054	68.40	34.1	0.088	0.566	N.A.	1.050	Y	1.311	0.3	1.7	35.8	0.9107	29.66	0.3481	0.26
46	11.80	0.142	83.1	0.849	19.61	0.7	283	3.56	14.62	1.072	69.99	35.4	0.088	0.574	N.A.	1.048	Y	1.328	0.2	1.7	37.1	0.9078	30.73	0.3477	0.17
47	11.94	0.142	84.1	0.849	19.61	0.7	283	3.56	14.80	1.090	71.59	36.7	0.088	0.581	N.A.	1.047	NA	1.344	0.1	1.7	38.4	0.905	31.81	0.3472	0.09
48	12.08	0.142	85.1	0.849	19.61	0.7	283	3.56	14.98	1.108	73.21	38.1	0.089	0.588	N.A.	1.045	NA	1.361	0.0	1.7	39.8	0.9022	32.91	0.3467	0.04
49	12.22	0.142	86.0	0.849	19.61	0.7	283	3.56	15.15	1.127	74.85	39.4	0.089	0.595	N.A.	1.044	NA	1.377	0.0	1.7	41.2	0.8995	34.02	0.3461	0.01
50	12.36	0.142	87.0	0.849	19.61	0.7	283	3.56	15.33	1.142	76.51	40.8	0.089	0.601	N.A.	1.042	NA	1.394	0.0	1.7	42.5	0.8969	35.16	0	0.00

Reference: 2022 CBC, ASCE 7-16

INPUT:

Job Location:	Costa Mesa, CA		
Site Class	D-Default		ASCE
0.2 Sec MCE, Ss	1.312	g	ASCE
1.0 Sec MCE, S_1	0.469	g	ASCE
Site Coeff., F_a	1.200		ASCE
Site Coeff., F_v	1.831		ASCE
$S_{MS} = F_a S_S$	1.574	g	ASCE
$S_{M1} = Fv\, S_1$	0.859	g	ASCE
$S_{DS} = 2/3 S_{MS}$	1.050	g	ASCE
$S_{D1} = 2/3 S_{M1}$	0.572	g	ASCE
$Ts = S_{D1}/S_{DS}$	0.545	sec	
Long Period transition period, T_L	8.0	sec	ASCE 7-16 -Figure 22-12
Risk Category	II		Table 1604.5
Seismic Design Category	D		2022 CBC Section 1613.3.5

OUTPUT:

Light Pole Class	LS50-AB		
Fundamental Period, T	1.62	sec	1/Pole Natural Frequency
Seismic coeff., R	1.5		ASCE 7-16 Table 15.4-2
Overstrength Factor, Ω	1.5		ASCE 7-16 Table 15.4-2
Importance Factor, I	1.00		ASCE 7-16 Section 15.4.1.1 & Table 1.5-2
Redundancy factor, ρ	1.0		ASCE 7-16 Section 15.6
DESIGN SEISMIC FORCE			
$V = C_S W$			ASCE 7-16 Eqn. 12.8-1
$C_S = S_{DS}/(R/I)$ for $T \le T_S$	0.700	g	ASCE 7-16 Eqn. 12.8-2
Cs max. for 1.5Ts <T≤ TL, Cs =1.5 SD1/T(R/I)	0.353	g	ASCE 7-16 Sect. 11.4.8 & Eqn. 12.8-3
C_S min = $0.044 S_{DS} I \ge 0.03$	0.046	g	ASCE 7-16 Eqn. 15.4-1
if $S_1 \ge 0.6$g, C_S min = $0.8 S_1/(R/I)$	N.A.	g	ASCE 7-16 Eqn. 15.4-2
Load Combination, 1.2D+ 1.0E			ASCE 7-16 Section 2.3.2 Load Comb 5
where E = Eh + Ev			ASCE 7-16 Eqn. 12.4-1
and Eh = pQ_E	0.353	W	ASCE 7-16 Eqn. 12.4-3
and Ev = $0.2 S_{DS} D$	0.210	D	ASCE 7-16 Eqn. 12.4-4
Load Combination, 1.2D + (pQe + $0.2 S_{DS} D$)			

Load Combination, 1.2D + (pQe + $0.2 S_{DS} D$)	1.410	D	+	0.353	W

Total Seismic Weight, W =	1.543	kips	See following page		
SEISMIC SHEAR, V =	0.682	kips	<	1.387 kips WIND SHEAR	WIND CONTROLS

Vertical Distribution of Seismic Force, F_x = $C_{vx}V$ ASCE7-16 Eqn. 12.8-11 & Section 12.8.5

k= 1.560

Item	w	h_x	$w_x h_x^k$	$w_x h_x^k / \sum w_x h_x^k$	Cvx*V	OTM
Fixtures	0.211	49.07	92	0.308	0.168	8.24
Fixtures	0.211	49.07	92	0.308	0.168	8.24
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
Top Pole Section	0.043	48.20	18	0.062	0.034	1.62
2nd Pole Section	0.253	34.30	63	0.211	0.115	3.95
1st Pole Section	0.358	12.75	19	0.064	0.035	0.44
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
			0	0.000	0.000	0.00
ECE	0.080	15.00	5	0.018	0.010	0.15
1/2 Precast base above grade	0.387	7.25	8	0.029	0.016	0.11
Sum	1.543		297	1.000	0.545	22.76
Total Dead Load at grade	1.929					

SEISMIC OTM = 22.76 kip-ft < 41.95 kip-ft Wind OTM WIND CONTROLS

engineer: CLC
design: Musco Pole Design 2B

Pole Calcuations - Page 1

ACI 318-14

Inputs

Pole Type	2B		f_{py} =	230.0 ksi	Strand Yield Strength
D_o =	11.92 in	Outer Diameter	f_{pu} =	270.0 ksi	Strand Ultimate Strength
D_i =	5.625 in	Inner Diameter	f'_c =	9.5 ksi	28 Day Strength of Concrete
D_{tc} =	9 in	Diameter of Tendon Circle	E_s =	29000.0 ksi	Elastic Modulus of Strand
d_t =	0.5 in	Strand Diameter	IPF =	0.64	Initial Prestress Factor
n =	10	Number of Tendons	PLF =	0.82	Prestress Loss Factor
A_{ps} =	0.153 in²	Area of Single Strand	a =	3.69 in	
Φ =	0.90	Resistance Factor	c =	5.67 in	
$ß_1$ =	0.65	$f_c \geq 8$ ksi			

Determine Concrete Compression Forces (Bending Only)

Calculate the Properties of the Compression Zone

A. Calculate the Section Properties based on Outer Radius (Note: These Calculations Assume there is no core in the pole)

$c_o = D_o/3$ = 3.97 in — Initial Guess

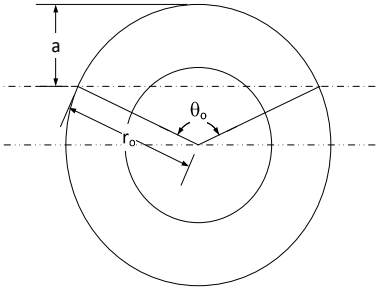
$r_o = D_o/2$ = 5.96 in

$\Theta_o = 2 * \cos^{-1}((r_o - a)/r_o)$ = 2.36

$I_o = r_o^4/8 * \Theta_o - \sin(\Theta_o) + (2*\sin(\Theta_o)*\sin(\Theta_o/2)^2)$ = 450.9 in^4

$A_o = (r_o^2*\cos^{-1}*(r_o-a)/r_o) - ((r_o-a)*\sqrt{(2*r_o*a)-a^2})$ = 29.36 in²

$y_{ro} = (4*r_o*\sin(\Theta_o/2)^3)/(3*(\Theta_o-\sin(\Theta_o)))$ = 3.80 in



B. Calculate the Section Properties based on Inner Radius (Note: These Calculations Assume there is no core in the pole)

$r_i = D_i/2$ = 2.81 in

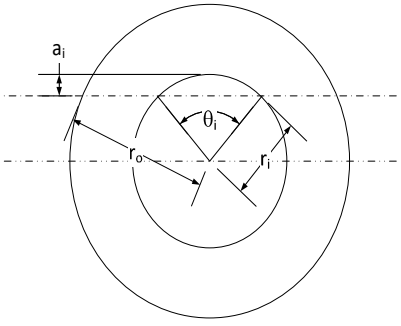
a_i = 0.54 in

$\Theta_i = 2 * \cos^{-1}((r_i - a_i)/r_i)$ = 1.26

$I_i = r_i^4/8 * \Theta_i - \sin(\Theta_i) + (2*\sin(\Theta_i)*\sin(\Theta_i/2)^2)$ = 7.5 in^4

$A_i = (r_i^2*\cos^{-1}*(r_i-a)/r_i) - ((r_i-a)*\sqrt{(2*r_i*a)-a^2})$ = 1.2 in²

$y_{ri} = (4*r_i*\sin(\Theta_i/2)^3)/(3*(\Theta_i-\sin(\Theta_i)))$ = 2.49 in



Note: If the inner raidius is outside the compression zone, I_i & A_i will be set to 0

Conclusion

A Calculate the Combined Section Properties:

$A_c = A_o - A_i$ = 28.1 in² — Area of the Compression Zone

$I_c = I_o - (I_i + A_i + y_{ri}^2)$ = 435.9 in^4 — Mass Moment of Intertia of Combined Section

$y = (A_o*y_o - A_i*y_i) / A_c$ = 3.85 in — Centroid for the Combined Arc Section

$y_c = c + r_o + y$ = 3.56 in — Centroid for the Effective Compression Area

$A' = \pi*(r_o^2 - r_i^2) - A_c$ = 58.6 in² — Area of the Tension Zone with the Strand Included

engineer: CLC
design: Musco Pole Design 2B

Pole Calcuations - Page 2

Determine Concrete Compression Forces (Bending Only)

Conclusion Continued

B. Compute the Effective Compression Area

Note: Then number of strands in compression (N_c) is determinde by the results of the calculations in the Tendon Strain Table.

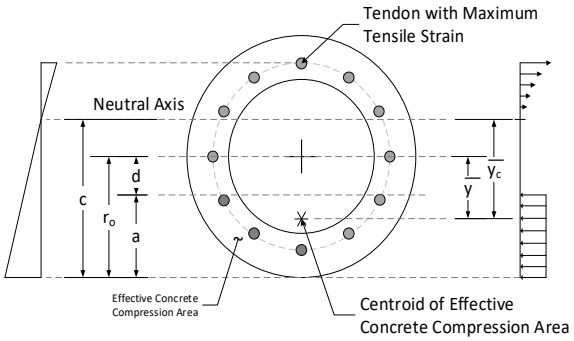
$A_{pscomp} = N_c * A_{ps} =$ 0.46 in²

Effective Area of Concrete in Compression

$A_e = A_c - A_{pscomp} =$ 27.69 in²

C. Compute the Compression Force

$F_c = A_e * 0.85 * f'_c =$ 223.6 kip



Determine Steel Tensile Forces

Calculate the Total Prestressing Force.

$f_{se} = IPF * PLF * f_{pu} =$	141.7 ksi	Total Prestressing Stress
$\varepsilon_{se} = f_{se}/E_s =$	0.0049	Prestressing Strain
$f_{py}/E_s =$	0.0079	Maximum Tendon Yield Strain
$F_{ps} = \varepsilon_{se} * A_{st} * E_s =$	21.7	Force in Single Prestress Strand
$F_t = \Sigma$ Line Forces =	223.6 kip	From the Tension Line Table

Converge the Forces to Achieve a Balance Condition

c =	5.67 in
$F_c - F_t =$	0 kip

Converge the Forces to Achieve a Balance C 0

A. Compressive Force Moment

$M_{cf} = (F_c * y_c)/(12*in/ft) =$ 66.4 k*ft

B. Tension Force Moment

$M_t = \Sigma M_{ti} =$ 25.2 k*ft Sum of Moments in the Tendon Line Table

Calculate Ultimate Moment Capacity

Extreme Tensile Strain =	0.0025	Within Transition Zone
$M_n = M_{cf} + M_t =$	91.6 kip*ft	
$M_a = \Phi M_n =$	**82.4 kip*ft**	
$M_{cr} =$	**42.5 kip*ft**	Cracking Moment (See Page 3)

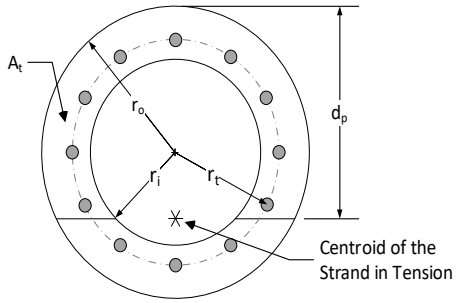
Calculate Development Length

$f_{se} =$	141.7 ksi	
$f_{py} / f_{pu} =$	0.85	
$\gamma_p =$	0.40	
Approximate $f_{ps} = (1-(\gamma_p * \rho * f_{pu}))/(f'_c * ß_1) * f_{pu} =$	176.9 ksi	ACI 318-14 Eqn 20.3.2.3.1
$L_d = (f_{se}/3000) * d_b + (f_{ps}-f_{se})/1000 * d_b =$	41.2 in	ACI 318-14 Eqn 25.4.8.1

engineer: CLC
design: Musco Pole Design 2B

Pole Calcuations - Page 3

Calculation of Mcr and Other Properties



$n_t = n - n_c = 7$

d_p = Σ Elevations of Tendons in Tension/n_t = 7.64 in

Distance from Centroid of Tension Steel to Center of Pole

$d = d_p - r_o = 1.68$ in

$b_o = D_o - d_p = 4.28$ in

Area of the Outer Region Determined by b_o

$A_{co}' = r_o^2*\cos^{-1}((r_o-b_o)/r_o)-((r_o-b_o)*\sqrt{((2*r_o*b_o)-r_o^2)}) = 36.0$ in²

Area of the Outer Region Determined by b_i

$b_i = b_o - (r_o - r_i) = 1.13$ in

$A_{ci}' = r_i^2*\cos-1((r_i-b_i)/r_i)-((r_i-b_i)*\sqrt{((2*r_i*b_i)-r_i^2)}) = 3.6$ in²

$A'' = A_{co}'-A_{ci}' = 32.4$ in²

$A_{tot} = \pi*(r_o^2-r_i^2) = 86.7$ in² Total Concrete Area

$b_{dp} = A_t = A_{tot} - A'' = 54.3$ in²

$f_r = 7.5*\sqrt{f'_c} = 731.0$ psi Modulus of Rupture

$f_{pe} = n*A_{ps}*f_{se}/A_{tot} = 2499.3$ psi

$I_g = \pi/4 * ((D_o)^4-(D_i)^4) = 941.86$ in Moment of Inertia of Gross Section

$M_{cr} = (f_r+f_{pe})/A_t*(I_g/r_o) = 42.5$ k*in Cracking Moment (ACI 318-14 24.2.3.9)

$\rho = 0.0197$ Reinforcement Ratio

project:
project number:
engineer: CLC
design: Musco Pole Design 2B

Pole Calcuations - Tendon Line Tension Table

ACI 318-14

n_t = 10 Number of Tendons

E = 29000 ksi Modulus of Elasticity

A_{ps} = 0.153 in² Area of a Strand

c = 5.67 in

LINE n	LINE STRAIN $S(e_b + \varepsilon_{se})$	fps (KSI)	FORCE (KIPS)	MOMENT (FT-KIPS)
1	0.0074	215.18	32.9230	13.14
2	0.0139	403.99	61.8111	20.24
3	0.0116	334.95	51.2475	7.18
4	0.0086	249.61	38.1902	-3.50
5	0.0062	180.57	27.6265	-7.71
6	0.0027	77.10	11.7958	-4.14
7	0.0000	0.00	0.0000	0.00
8	0.0000	0.00	0.0000	0.00
9	0.0000	0.00	0.0000	0.00
10	0.0000	0.00	0.0000	0.00
11	0.0000	0.00	0.0000	0.00
12	0.0000	0.00	0.0000	0.00
13	0.0000	0.00	0.0000	0.00
14	0.0000	0.00	0.0000	0.00
15	0.0000	0.00	0.0000	0.00
16	0.0000	0.00	0.0000	0.00
17	0.0000	0.00	0.0000	0.00
18	0.0000	0.00	0.0000	0.00
19	0.0000	0.00	0.0000	0.00
20	0.0000	0.00	0.0000	0.00
21	0.0000	0.00	0.0000	0.00
22	0.0000	0.00	0.0000	0.00
23	0.0000	0.00	0.0000	0.00
24	0.0000	0.00	0.0000	0.00
25	0.0000	0.00	0.0000	0.00
26	0.0000	0.00	0.0000	0.00
	Σ =	1461.40	223.59	25.20

project:
project number:
engineer: CLC
design: Musco Pole Design 2B

Pole Calcuations - Tendon Line Tension Table

ACI 318-14

n_t =	10	Number of Tendons	c =	5.67 in	From Iteration
r_o =	5.96 in	Outer Radius	ε_{se} =	0.0049	Prestressing Strain
D_{tc} =	9	Diameter of Tendon Circle	ε_{smax} =	0.0079	Maximum Tendon Yield Strain
a =	3.69 in	ß1 * c			

TENDON #	ANGLE (FROM VERT) (RADIANS)	ANGLE (FROM VERT) (DEGREES)	TENDON ELEV. (INCHES) (FROM COMP. SIDE)	BENDING STRAIN ε_b	TOTAL STRAIN $\varepsilon_b + e_{se}$	TENDON w/in COMP. BLOCK? (Y = 1, N = 0)	TENDON ELEV. TO THOSE IN TEN. (FROM COMP. SIDE)
1	0.00	0	10.46	0.0025	0.0074	0	10.46
2	0.63	36	9.60	0.0021	0.0070	0	9.60
3	1.26	72	7.35	0.0009	0.0058	0	7.35
4	1.88	108	4.57	-0.0006	0.0043	0	4.57
5	2.51	144	2.32	-0.0018	0.0031	1	0.00
6	3.14	180	1.46	-0.0022	0.0027	1	0.00
7	3.77	216	2.32	-0.0018	0.0031	1	0.00
8	4.40	252	4.57	-0.0006	0.0043	0	4.57
9	5.03	288	7.35	0.0009	0.0058	0	7.35
10	5.65	324	9.60	0.0021	0.0070	0	9.60
11	NA	NA	NA	NA	NA	0	0.00
12	NA	NA	NA	NA	NA	0	0.00
13	NA	NA	NA	NA	NA	0	0.00
14	NA	NA	NA	NA	NA	0	0.00
15	NA	NA	NA	NA	NA	0	0.00
16	NA	NA	NA	NA	NA	0	0.00
17	NA	NA	NA	NA	NA	0	0.00
18	NA	NA	NA	NA	NA	0	0.00
19	NA	NA	NA	NA	NA	0	0.00
20	NA	NA	NA	NA	NA	0	0.00
21	NA	NA	NA	NA	NA	0	0.00
22	NA	NA	NA	NA	NA	0	0.00
23	NA	NA	NA	NA	NA	0	0.00
24	NA	NA	NA	NA	NA	0	0.00
25	NA	NA	NA	NA	NA	0	0.00
26	NA	NA	NA	NA	NA	0	0.00
						Σ = 3	53.50 in

DESIGN OF EMBEDDED POLE FOOTING-
NONCONSTRAINED
2019 CBC Section 1807.3.2.1

KNA STRUCTURAL ENGINEERS

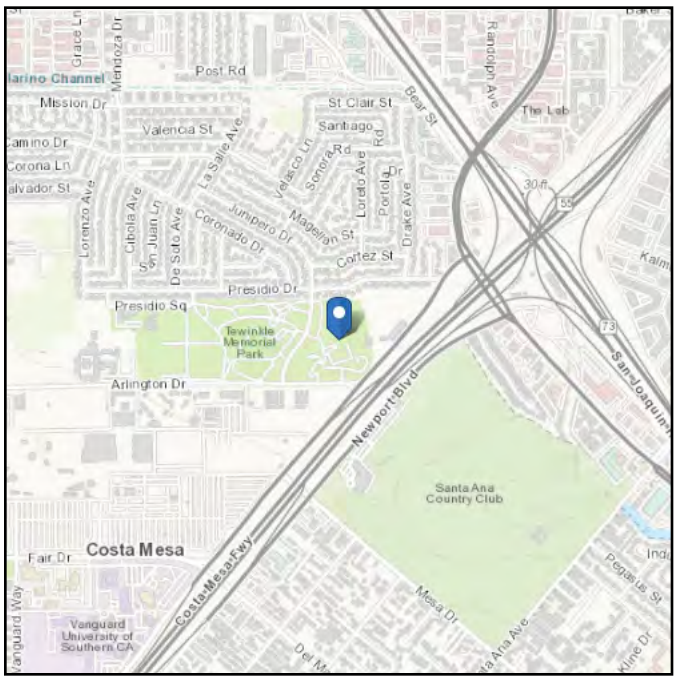
Mark/Type Grade			LS50-A	LS50-AB
INPUT				
Shear, P	lbs	=	540	832
height of P above grade, h	ft	=	29.3	31.2
allow lateral brg pressure, s	psf/ft	=	200	200
max allow lateral brg pressure	psf/ft	=	2400	2400
Pier Diameter, b	ft	=	2.5	2.5
OUPUT				
Moment at grade, M	ft-lbs	=	15,826	25,999
acting lateral brg pressure, S_1	psf	=	443	526
allow lateral brg pressure, S_1	psf	=	443	526
$A=2.34P/(S_1b)$		=	1.14	1.48
Min req'd embedment, d $=A/2\{1+(1+4.36h/A)^{1/2}\}$	ft	=	6.64	7.88
Add Depth to Ignore			1.00	1.00
Total Embed Required			7.64	8.88
USE 30 IN DIAMETER --->			8'-0	
USE 30 IN DIAMETER --->				10'-0

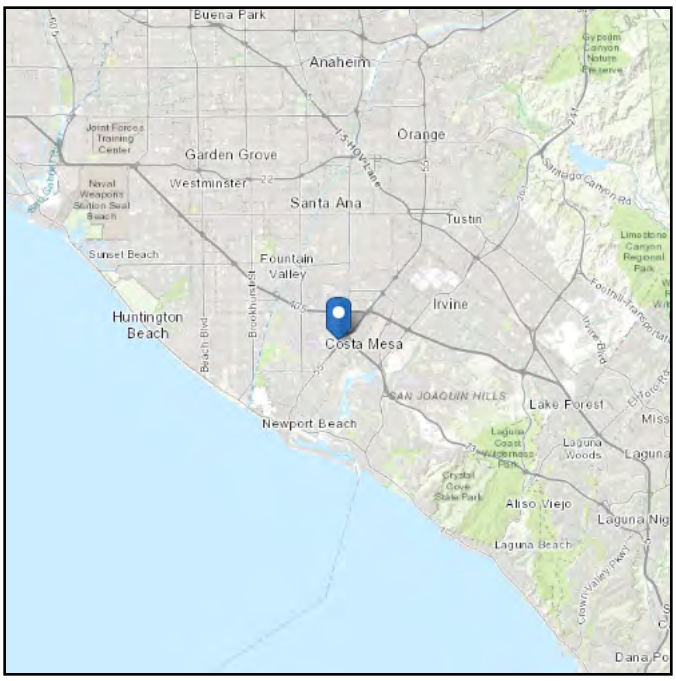
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 33.670293
Longitude: -117.893252
Elevation: 51.389649551292884 ft (NAVD 88)





Wind

Results:

Wind Speed	95 Vmph
10-year MRI	66 Vmph
25-year MRI	72 Vmph
50-year MRI	76 Vmph
100-year MRI	81 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Tue Nov 07 2023

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.312	S_{D1} :	N/A
S_1 :	0.469	T_L :	8
F_a :	1.2	PGA :	0.565
F_v :	N/A	PGA_M :	0.677
S_{MS} :	1.574	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.05	C_v :	1.362

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Tue Nov 07 2023

Date Source: USGS Seismic Design Maps

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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POLE FOUNDATION SCHEDULE
(SEE LIGHT POLE FOUNDATION DETAIL)

TYPE	ASD GROUNDLINE FORCES (MAXIMUM)			C.I.P. DEEP FOUNDATION	
	MOMENT (M) KIP–FT	SHEAR (V) KIPS	VERTICAL (P) KIPS *	DIAMETER INCHES	EMBEDMENT FEET
LSS50–A	15.290	0.540	0.560	30"	8'–0"
LSS50–AB	25.170	0.832	1.136	30"	10'–0"

* VERTICAL FORCE DOES NOT INCLUDE WEIGHT OF PRECAST BASE. VERTICAL (P) LOAD IS THE DRESSED POLE WEIGHT FOR ERECTION PURPOSES.

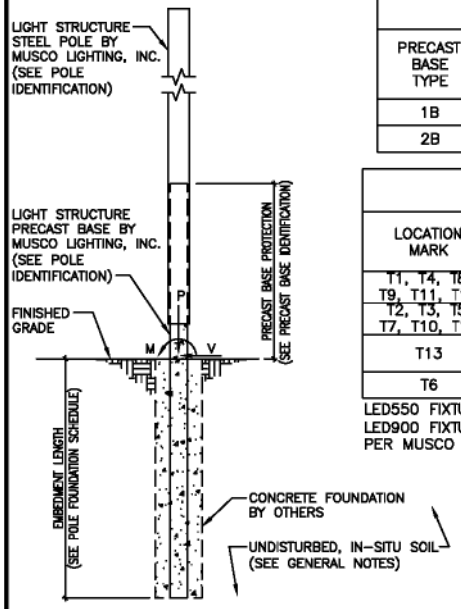
PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	WEIGHT LBS	OVERALL LENGTH FEET	HEIGHT ABOVE GRADE FEET	EMBEDMENT IN C.I.P. DEEP FOUNDATION FEET	OUTSIDE DIAMETER INCHES
1B	1,020	15'–2"	7'–2"	8'–0"	9.563"
2B	1,840	17'–3"	7'–3"	10'–0"	12.00"

POLE IDENTIFICATION

LOCATION MARK	POLE TYPE	PRECAST BASETYPE	FIXTURE CONFIGURATION (MAX # OF FIXTURES PER CROSSARM)	FIXTURE EPA (MAXIMUM)
T1, T4, T8, T9, T11, T14	LSS50–A	1B	2 LED550	3.0
T2, T3, T5, T7, T10, T12	LSS50–AB	2B	4 LED550	6.4
T13			4(2 LED900, 2 LED550)	7.2
T6			8(4/4) LED550	12.4

LED550 FIXTURE: EPA = 1.6 SQ–FT MAX & WEIGHT = 40 LBS (FIXTURE ALONE),
LED900 FIXTURE: EPA = 1.8 SQ–FT MAX & WEIGHT = 80 LBS (FIXTURE ALONE),
PER MUSCO LIGHTING, INC.



LIGHT POLE FOUNDATION DETAIL
SCALE: NO SCALE

STATEMENT OF SPECIAL INSPECTIONS*

ITEM	CONTINUOUS/PERIODIC	SCOPE
1. PIER FOUNDATIONS	CONTINUOUS	INSPECT INSTALLATION OF DRILLED PIER FOUNDATIONS. VERIFY DIAMETER, EMBEDMENT DEPTHS AS SCHEDULED, DEPTHS OF FILL, AND BEARING STRATA
2. CONCRETE PLACEMENT	CONTINUOUS	INSPECT PLACEMENT OF CONCRETE FOR PROPER APPLICATION TECHNIQUES. VERIFY THAT CONCRETE CONVEYANCE AND DEPOSITING AVOIDS SEGREGATION OR CONTAMINATION. VERIFY THAT CONCRETE IS PROPERLY CONSOLIDATED.
3. CRETEX PRECAST/ PRESTRESSED CONCRETE BASES	(PCI CERTIFIED)	FABRICATOR EXEMPT.** REFERENCE ICC ESR–3765.
4. STRUCTURAL STEEL	(L.A. CITY APPROVED)	FABRICATOR EXEMPT.** REVIEW CERTIFIED MILL TESTS REPORTS AND IDENTIFICATION MARKINGS.

* The Special Inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the Building Official, for inspection of the particular type of construction or operation requiring special inspection.
**Special inspections shall not be required when the work is done on the premises of a fabricator registered and approved by the City to perform such work without special inspection.

GENERAL NOTES

ALL CONSTRUCTION AND WORKMANSHIP SHALL CONFORM TO THE CALIFORNIA BUILDING CODE, 2022 EDITION.

WIND– ASCE 7–16, Vult = 95 MPH (EXPOSURE C); Vasd = 74 MPH (EXPOSURE C), RISK CATEGORY II

SEISMIC – SS=1.312; S1=0.469; SDS=1.050; SD1=0.572; RISK CATEGORY=II; I=1.0; SITE CLASS=D; R=1.5; SEISMIC DESIGN CATEGORY=D–DEFAULT; SEISMIC–FORCE–RESISTING–SYSTEM=NON–BUILDING STRUCTURE, NOT SIMILAR TO BUILDINGS; ANALYSIS PROCEDURE=EQUIVALENT LATERAL FORCE PROCEDURE.

REFERENCE POLE LOCATION DRAWING FOR ACTUAL POLE PLACEMENT AND SITE LOCATION.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION PROCEDURES AND SAFETY CONDITIONS AT THE JOB SITE.

SOIL DESIGN PARAMETERS

REFERENCE CHAPTER 18, SECTIONS 1806, 1807, AND 1810 OF THE 2022 EDITION OF THE CALIFORNIA BUILDING CODE. ASSUME CLASS 5 SOILS.

ASSUMED ALLOWABLE END BEARING SOIL PRESSURE: 1,500 PSF (TABLE 1806.2) OR 250 PSF SKIN FRICTION (SECTION 1810.3.3.1.4)

ASSUMED ALLOWABLE LATERAL PASSIVE SOIL BEARING PRESSURE: 200 PSF/FT FOR ISOLATED POLES NOT ADVERSELY AFFECTED BY A 0.5 INCH MOTION AT THE GROUND SURFACE (SECTION 1806.3.4).

ASSUMED DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL DESIGN PARAMETERS AT LEVEL OR SLOPING CONDITIONS (IF ANY) MUST BE VERIFIED BY A GEOTECHNICAL ENGINEER.

ENCOUNTERING SOIL FORMATIONS THAT WILL REQUIRE SPECIAL DESIGN CONSIDERATIONS OR EXCAVATION PROCEDURES MAY EXIST. POLE FOUNDATIONS MAY NEED TO BE REANALYZED ACCORDING TO THE SOIL CONDITIONS THAT EXIST.

IF ANY DISCREPANCIES OR INCONSISTENCIES ARISE, NOTIFY THE ENGINEER OF SUCH DISCREPANCIES. FOUNDATIONS WILL THEN BE REVISED ACCORDINGLY.

ALL PRECAST BASES AND CONCRETE BACKFILL MUST BEAR ON AND AGAINST FIRM, UNDISTURBED SOIL OR AS APPROVED BY A GEOTECHNICAL ENGINEER.

ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND PLACEMENT OF CONCRETE BACKFILL. CASING MAY BE REQUIRED IF CAVING OCCURS. IN SUCH A CASE, APPROVAL BY A GEOTECHNICAL ENGINEER IS REQUIRED.

ALL EXCAVATIONS MUST BE FREE OF WATER OR CONCRETE SHALL BE PLACED WITH A TREMIE PIPE IN ACCORDANCE WITH ACI STANDARD 336. CONCRETE PLACED BY THE TREMIE METHOD SHALL HAVE A MINIMUM ULTIMATE STRENGTH OF 1,000 PSI GREATER THAN REQUIRED UNDER "CONCRETE BACKFILL" BELOW.

CONCRETE BACKFILL

CONCRETE BACKFILL WITHOUT STEEL REINFORCEMENT SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH AT 28 DAYS OF 3,000 PSI (2,500PSI USED FOR STRUCTURAL DESIGN). SEE STATEMENT OF SPECIAL INSPECTIONS REQUIRED.

CONCRETE BACKFILL SHALL ATTAIN A MINIMUM STRENGTH OF 2,500 PSI PRIOR TO STEEL POLE ERECTION. USE TYPE II/V PORTLAND CEMENT OR AS RECOMMENDED BY THE ENGINEER. MIX IN CONFORMANCE WITH ASTM C–94. AGGREGATES PER ASTM C–33. (1" MAX AGG. SIZE). 3/8" MAX AGG. SIZE ACCEPTABLE WHERE PUMP MIXES ARE USED FOR UNREINFORCED CONCRETE BACKFILL.

PLACE CONCRETE IMMEDIATELY AFTER COMPLETION OF EXCAVATION AND INSPECTION BY THE GEOTECHNICAL ENGINEER. NO EXCAVATIONS SHALL BE LEFT UNPROTECTED OR OPEN OVERNIGHT.

CONCRETE SHALL BE PLACED IN ONE CONTINUOUS OPERATION (NO CONSTRUCTION JOINT) TO GRADE, WITH SPECIAL EQUIPMENT, WITH A MAXIMUM FREEFALL OF 5 FT AND TO PREVENT CONCRETE FROM STRIKING THE SIDES OF THE EXCAVATION. VIBRATE TOP 5 FT OF CONCRETE AT UNREINFORCED PIERS, VIBRATE FULL DEPTH AT REINFORCED PIERS.

MISCELLANEOUS

FIXTURES MUST BE LOCATED TO MAINTAIN 10'–0" MINIMUM HORIZONTAL CLEARANCE FROM ANY OBSTRUCTION. POLES, FIXTURES, PRECAST BASES, ELECTRICAL ITEMS, PLATFORMS, SPECIFICATIONS, AND INSTALLATION PER MUSCO LIGHTING, INC.

POLE SUPPORT FOUNDATION	MUSCO LIGHTING, INC. 2107 STEWART ROAD MUSCATINE, IOWA 52761 MUSCO No. 215837	DATE 11/07/23
TEWINKLE PARK TENNIS COSTA MESA, CA	KNA STRUCTURAL ENGINEERS 9931 MUIRLANDS BLVD. IRVINE CA, 92618 KNA No. 463.358	SHEET C1 OF 1

Project Submittal: Bill of Materials

Equipment Description	
56	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-900 luminaires
16	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-1200 luminaires
36	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-1500 luminaires
✓	Factory wired and assembled pole top luminaire assemblies
✓	Factory wired electrical component enclosures
✓	Factory built wire harnesses with plug-in connections
Controls	
1	24” x 72” Control and monitoring cabinet
1	24” x48” Control and monitoring cabinet
1	24” x 72” Control and monitoring cabinet- secondary
28	30-amp contactors
8	On-Off-Auto (OOA) switches
Warranty	
✓	Musco’s Constant 25™ product assurance and warranty program that eliminates 100% maintenance costs for 25 years, including labor, materials, monitoring and guaranteed light levels.

Project Submittal: Bill of Materials

Equipment Description	
37	CREE OSQ LED Fixtures LED
13	27’ Valmont soft square steel pole with base plate
Controls	
1	24” x 48” Control and monitoring cabinet
5	30-amp contactors
1	On-Off-Auto (OOA) switches
Warranty	
✓	Musco’s 10-Year warranty guarantees your lighting system to be free from defects in materials and workmanship. This includes labor and materials to replace defective parts or repair defects in workmanship.

Project Submittal: Bill of Materials

Equipment Description	
14	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-900 luminaires
66	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-1200 luminaires
18	Light-Structure System™ Retrofit Total Light Control™ TLC-LED-1500 luminaires
32	Light-Structure System™ Retrofit Total Light Control™ TLC-BT-575 luminaires
✓	Factory wired and assembled pole top luminaire assemblies
✓	Factory wired electrical component enclosures
✓	Factory built wire harnesses with plug-in connections
Controls	
1	24”x 72” Control and monitoring cabinet primary
1	24” x 72” Control and monitoring cabinet secondary
24	30-amp contactors
4	On-Off-Auto (OOA) switches
Warranty	
✓	Musco’s Constant 25™ product assurance and warranty program that eliminates 100% maintenance costs for 25 years, including labor, materials, monitoring and guaranteed light levels.

Project Submittal: Bill of Materials

Equipment Description	
46	Light-Structure System™ Total Light Control™ TLC-LED-550 luminaires
2	Light-Structure System™ Total Light Control™ TLC-LED-900 luminaires
14	50’ galvanized steel poles
14	Pre-cast concrete foundations (9,500 PSI) with integrated grounding
Controls	
2	24” X 72” Control and monitoring cabinet
Warranty	
✓	Musco’s Constant 25™ product assurance and warranty program that eliminates 100% maintenance costs for 25 years, including labor, materials, monitoring and guaranteed light levels.

ATTACHMENT 2

CITY OF COSTA MESA

ORANGE COUNTY, CALIFORNIA

NOTICE TO BIDDERS, PROPOSAL, CONTRACT, AND
SPECIAL PROVISIONS FOR

LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT

CITY PROJECT NO. 23-09

Prepared Under the Direction of

Seung Yang, P.E.

City Engineer

Copy No. _____ Checked by _____

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PAGE NUMBER

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MISCELLANEOUS CONTRACT DOCUMENTS

PROJECT LOCATION MAP

CITY OF COSTA MESA
ORANGE COUNTY, CALIFORNIA
NOTICE INVITING BIDS

NOTICE IS HEREBY GIVEN that the City of Costa Mesa ("City") invites sealed bids, to be submitted electronically only, for the following project:

LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

1. **BID SUBMISSION AND OPENING:** Bids must be submitted electronically via the City of Costa Mesa's PlanetBids portal before the deadline of **3:00 P.M., Thursday, November 9, 2023**, at which time or shortly thereafter the City Clerk will open bids electronically. The bid results will be posted online via PlanetBids. No paper bids or any other form of submittal will be accepted. Any bid received after the scheduled closing time for the receipt of bids will be rejected. The City is not responsible for and accepts no liability in the event a response is late due to any network, internet, or any other technical difficulty or interruption. It shall be the sole responsibility of the bidder to ensure that his/her/its bid is received by the deadline.

   To access the bid documents and bid on this project, potential vendors and bidders must first register through the City's PlanetBids portal at: *https://www.planetbids.com/portal/portal.cfm?CompanyID=45476*.

2. **SCOPE OF WORK AND BID DOCUMENTS:** The scope of work generally consists of all labor, parts, materials, equipment, deliveries, setup, mobilization, etc., to fully install and operate City-furnished light-emitting diode (LED) lights at the following City parks and athletic facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex.

   The plans, specifications, and bid documents for this project can be obtained via the City's PlanetBids portal at: *https://www.planetbids.com/portal/portal.cfm?CompanyID=45476*.

   It is the bidder's responsibility to ensure that the most current version of the solicitation, including any addenda, has been downloaded. Bids received without the applicable addenda will be rejected as incomplete.

3. **PRE-BID MEETING OR JOB WALK:** NONE.

4. **BID CONTENTS:** All bids must be submitted on the proposal form included in the bid documents. No bid will be considered unless it is made on the proposal form furnished by the City and made in accordance with the provisions of the bid requirements.

5. **BID SECURITY:** Each bidder must submit an **original** certified check, cashier's check, or a bid bond, made payable to or in favor of the City of Costa Mesa, in an amount equal to at least ten percent (10%) of the total amount of the bid, to the Costa Mesa City Clerk prior to the bid submission deadline. No bid will be considered unless such certified check, cashier's check, or bid bond was received by the City Clerk prior to the bid submission deadline. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

6. **CONTRACTOR'S LICENSE:** A valid **California Contractor's License Class "C-10" (Electrical Contractor)** issued by the California Contractors State License Board is required at the time the contract is awarded pursuant to California Public Contract Code section 3300. Each bidder must also be qualified as required by law at the time of the bid opening.

7. **REGISTRATION WITH THE DEPARTMENT OF INDUSTRIAL RELATIONS:** Pursuant to Labor Code sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed

in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work unless registered and qualified pursuant to Labor Code section 1725.5.

8. **PREVAILING WAGES:** This project is a "public work" subject to prevailing wage requirements. Pursuant to provisions of Sections 1770 et seq. of the California Labor Code, all works employed on the project shall be paid not less than the general prevailing rate of per diem wages, as determined by the Director of the Department of Industrial Relations (DIR) for work of a similar character in the locality in which the work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work. Copies of the prevailing rate of per diem wages are on file with Costa Mesa Public Services Department and are available to any interested party upon request. The applicable State prevailing wages are also set forth on the Department of Industrial Relations' website: http://www.dir.ca.gov; these rates are subject to predetermined increases. The prime contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This project is subject to compliance monitoring and enforcement by the DIR.

9. **PAYMENT BOND AND PERFORMANCE BOND:** A Payment Bond and a Performance Bond, each in the amount of 100% of the contract amount, will be required of the successful bidder prior to award of the contract.

10. **RETENTION:** The City withholds five percent (5%) of each progress payment as retention. Pursuant to Public Contract Code section 22300, the successful bidder may substitute certain securities for money withheld by the City to ensure performance of the contract. At the request and expense of the contractor, securities equivalent to the amount withheld shall be deposited with the public agency, or with a state or federally chartered bank in this state as the escrow agent, who shall then pay those moneys to the contractor. Securities will be returned to the contractor upon satisfactory completion of the contract.

11. **NON-DISCRIMINATION:** The bidding process and contract are subject to State and Federal non-discrimination requirements, including but not limited to the requirement that no person or business shall discriminate on the basis of race, color, national origin, ancestry, religious creed, physical disability, mental disability, medical condition, marital status, sex, gender, gender expression, gender identity, sexual orientation, age, or military or veteran status in its solicitation, selection, hiring, or treatment of individuals or businesses in connection with the bidding process or work performed for the City in connection with the project.

12. **CITY'S RIGHT TO REJECT BIDS:** The City of Costa Mesa reserves the right, in its sole discretion, to reject any or all bids, or to waive any minor irregularities or informalities in any bid.

13. **ADDITIONAL REQUIREMENTS:** This project is subject to local, State, and Federal regulations and requirements, as detailed in the bid documents, including economic sanctions against the Russian Federation.

For all inquiries, please contact **Rob Ryan**, Maintenance Services Manager, Public Works Department, via e-mail at *robert.ryan@costamesaca.gov*.

Brenda Green, City Clerk
City of Costa Mesa
Dated: October 5, 2023

INFORMATION FOR BIDDERS

1. PREPARATION OF BID FORM: The City of Costa Mesa (City) requires that bids be submitted on the proposal available on *PlanetBids* at such time and place as is stated in the Notice Inviting Bids. All information requested in the bid forms must be provided. All bids shall be submitted electronically via the City's public bidding platform, *PlanetBids* **only**. No other form of submittal shall be accepted. It is the sole responsibility of the Bidder to see that his bid is received in proper time. Any bid received after the scheduled closing time for receipt of bids will be **rejected**. Each Bidder is responsible for acknowledging all addenda.

2. QUALIFICATION OF BIDDERS: Each Bidder shall submit a list of Construction Project References indicating Public Works and/or similar construction projects completed or in progress within the last 24 months. Forms for this purpose are furnished with the bid package.

3. BID SECURITY / BID BOND: Each bid shall be accompanied by either cash, cashier's check made payable to the City, a certified check made payable to the City, or a bidder's bond executed by an admitted surety insurer, made payable to the City, in an amount not less than 10% of the maximum amount of the bid. The Bidder's Bond shell be signed by both, the bidder and the Surety; and both signatures shall be notarized. The bid security shall be given as a guarantee that the bidder shall execute the contract if it be awarded to him in conformity with the Contract Documents and shall provide the surety bond or bonds as specified therein within fourteen (14) days after a written Notice of Intent to Award Contract is deposited in the mail. ***NO electronic bid securities through e-mail or other electronic means will be accepted.***

4. NONCOLLUSION AFFIDAVIT: Each bid shall be accompanied by a notarized Noncollusion Affidavit on a form which is included in the Contract Documents.

5. SIGNATURE: Via the *PlanetBids* platform, the bid must be *electronically* or *digitally* signed in the name of the Bidder and must be person or persons duly authorized to sign the bid on behalf of the Bidder.

6. CORRECTIONS: Any corrections made to the submitted bid must be made electronically via *PlanetBids*.

7. DELIVERY OF PROPOSAL: Proposals shall be submitted electronically via PlanetBids: *https://www.planetbids.com/portal/portal.cfm?CompanyID=45476*. No other form of submittal shall be accepted by the City.

8. BID DEPOSIT RETURN: Deposits of three of more low bidders, the number being at the discretion of the City, will be held for sixty (60) calendar days or until posting by the successful bidder of the Bonds and Certificates of Insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the deposits will be returned.

9. TAXES: No mention shall be made in the proposal of Sales Tax, Use Tax or any other tax, as all amounts bid will be deemed and held to include any such taxes which may be applicable.

10. WITHDRAWAL OF BIDS: Any bidder may withdraw his bid either personally, by written request, or by telegraphic request confirmed in the manner specified above at any time prior to the scheduled closing time for receipt of bids.

11. AGREEMENT AND BONDS: The Agreement form, which the successful bidder, as Contractor, will be required to execute, and the forms and amounts of surety bonds and Certificate of Insurance which he will be required to furnish prior to the execution of the Agreement, are included in the Contract Documents and should be carefully examined by the Bidder. The successful Bidder will be required to submit **THREE (3)** executed copies of the Agreement, the Performance Bond, the Payment Bond and the Certificate of Insurance. Payment and performance bonds shall be issued by a surety who is listed in the latest revision of U.S. Department of Treasury Circular 570 and Code of Civil Procedure Section 995.120. The Performance Bond and the Payment Bond shall be signed by both, the Bidder and the Surety; and both signatures shall be notarized.

12. FORFEITURE FOR FAILURE TO POST SECURITY AND EXECUTE AGREEMENT: In the event the Bidder to whom the Notice of Intent to Award Contract is given fails or refuses to post the required bonds and Certificate of Insurance and return executed copies of the Agreement within fourteen (14) calendar days after notification, the City may declare the Bidder's bid deposit or bond forfeited as damages caused by the failure of the bidder to post such security and execute such copies of the Agreement, and may give Notice of Intent to Award Contract to the next lowest responsive and responsible bidder, or may call for new bids.

13. BIDDERS INTERESTED IN MORE THAN ONE BID: No person, firm or corporation shall be allowed to make, or file or be interested in more than one bid for the same work unless alternate bids are specifically called for.

14. EXAMINATION OF SITE AND CONTRACT DOCUMENTS: Each bidder shall visit the site of the proposed work and fully acquaint himself with the conditions relating to the construction and labor so that he may fully understand the facilities, difficulties, and restrictions attending the execution of the work under the contract. Bidders shall thoroughly examine and be familiar with the drawings and specifications. The failure or omission of any bidder to receive or examine any contract document, form, instrument, addendum, or other document or to visit the site and acquaint himself with conditions there existing shall in no way relieve any bidder from any obligation with respect to his bid or to the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this section.

15. INTERPRETATION OF PLANS AND DOCUMENTS: If any Bidder contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the drawings, specifications, or other Contract Documents, or finds discrepancies in, or omissions from the drawings and specifications, it may submit to the Engineer a written request for an interpretation or correction thereof. The Bidder submitting the Request for Interpretation (RFI) shall be responsible for its prompt delivery and on the form included within this IFB (Page B-6) Any interpretation or correction of the Contract Documents will be made only by addendum duly issued and a copy of such addendum will be mailed or delivered to each person receiving a set of the Contract Documents. No person is authorized to make any oral interpretation of any provision in the Contract Documents to any Bidder, and no Bidder is authorized to rely on any such unauthorized oral interpretation.

16. ADDENDA: The effect of all addenda to the Contract Documents shall be considered in the bid package and said addenda shall be made part of the Contract Documents and shall be returned with the bid package. Failure to submit any such addenda with the bid package may render the bid irregular and result in its rejection by the City.

17. QUESTIONS TO THE ENGINEER: Questions regarding the bid documents (i.e. Plans, Specifications, Contract Documents, Bid Forms, etc.) will be received by the Engineer up to five (5) working days prior to the bid opening as specified in the Notice Inviting Bids. Questions asked of the Engineer after this time will not be addressed.

18. EQUIVALENT MATERIALS: Requests for the use of equivalents to those specified, must be submitted to the City. Only substitutions approved prior to bid due date via addenda Product Substitutions, will be considered. No substitutions will be considered after bid due date and contract award. It is the sole responsibility of the successful bidder to prove to the City that such a material is truly an equivalent.

19. EVIDENCE OF RESPONSIBILITY: Upon the request of the City, a bidder whose bid is under consideration for the award of the contract shall submit promptly to the City satisfactory evidence showing the Bidder's financial resources, its construction experience, and its organization and plant facilities available for the performance of the contract.

20. LEGAL RESPONSIBILITIES: All proposals must be submitted, filed, made and executed in accordance with State and Federal laws relating to bids for contracts of this nature whether the same or expressly referred to herein or not. Any Bidder submitting a proposal shall by such action thereby agree to each and all of the terms, conditions, provisions and requirements set forth, contemplated and referred to in the Plans, Specifications and other Contract Documents, and to full compliance therewith. Additionally, any Bidder submitting a proposal shall, by such action thereby, agree to pay at least the minimum prevailing per diem wages as provided in Section 1773, et. seq. of the Labor Code for each craft, classification or type of workman required as set forth by the Director of Industrial Relations of the State of California.

21. ANTI-DISCRIMINATION: It is the policy of the City that in connection with all work performed under contracts, there be no discrimination against any prospective or active employee engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age, or marital status. The Contractor agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code Section 12900, and Labor Code Section 1735. In addition, the Contractor agrees to require like compliance by any subcontractors employed on the work by him/her.

22. DRUG-FREE WORKPLACE POLICY: Contractor, upon notification of contract award, shall establish a Drug-Free Awareness Program to inform employees of the dangers of drug abuse in the workplace, the penalties that may be imposed upon employees for drug abuse violations occurring in the workplace, and the employee assistance programs available to employees. Each employee engaged in the performance of a City contract must be notified of this Drug-Free Awareness Program, and must abide by its terms. Contractor shall conform to all the requirements of City's Policy No. 100-5. Failure to establish a program, notify employees, or inform the City of a drug-related workplace conviction will constitute a material breach of contract and cause for immediate termination of the contract by the City.

23. BID PROTEST PROCEDURES: Any bid protest must be submitted in writing before 5:00 PM of the 5th business day following bid openings. The initial protest document shall contain a complete statement of the basis for the protest. The protest shall refer to the specific portion of the document which forms the basis for the protest. The protest shall include the name, address and telephone number of the person representing the protesting party. The party filing the protest shall concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the outcome of the protest. Such parties shall include all other Bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest. Upon receipt of a bid protest, the matter shall be reviewed by the Public Services Director, whose decision shall be final. This procedure supersedes the procedure of appeal outlined in City of Costa Mesa Municipal Code Section 2-303.

24. ASSEMBLY BILL 626: Assembly Bill 626 (AB 626), adds section 9204 to the Public Contract Code creating a claims resolution process applicable to any claim (as defined) by a contractor against a public entity filed in connection with a public works project. Section 9204 applies to public works contracts entered into on and after January 1, 2017. The legislation was supposed to sunset (end) on January 1, 2020, unless extended by subsequent legislation. The summary of Section 9204 is specified as follows:

    In the event of any dispute or controversy with the City over any matter whatsoever, the Contractor shall not cause any delay or cessation in or of Work, but shall proceed with the performance of the Work in dispute. The Contractor shall retain any and all rights provided that pertain to the resolution of disputes and protests between the parties. The Disputed Work will be categorized as an “unresolved dispute” and

payment, if any, shall be as later determined by agreement or a court of law. The Contractor shall keep accurate, detailed records of all Disputed Work, claims and other disputed matters.

All claims arising out of or related to the Contract Documents or this Project, and the consideration and payment of such claims, are subject to the Government Claims Act (Government Code Section 810 et seq.) with regard to filing claims. All such claims are also subject to the dispute procedures set forth in Public Contract Code Section 9204 and Public Contract Code Section 20104, et seq. (Article 1.5), to the extent each is applicable. This Contract hereby incorporates those provisions as through fully set forth herein. Thus, the Contractor or any Subcontractor must file a claim in accordance with the Government Claims Act as a prerequisite to filing a construction claim in compliance with Section 9204 and Section 20104 et seq. (if applicable), and must then adhere to Section 20104, et seq. and Section 9204, as applicable, pursuant to the definition of “claim” as individually defined therein.

REQUEST FOR INTERPRETATION OF CONTRACT DOCUMENTS

Date:

Time:

Company:

Contact Person:

Address:

Telephone:	**FAX:**

Plan Sheet:

Specification Section:

INTERPRETATION REQUESTED:

REPLY:

T0 A/E:

PROPOSAL
FOR THE
LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

The Honorable City Council
City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92626

Dear Council Members:

In compliance with the NOTICE INVITING BIDS FOR THE **LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09,** a copy which is hereto attached, the undersigned has carefully examined the location of the proposed Work, the Plans, Specifications and other Contract Documents and is therefore satisfied as to the conditions to be encountered, as to the character, quality and quantity of work to be performed and materials to be furnished and as to the requirements of the specifications and the Contract. It is mutually agreed that the submission of a proposal shall be considered prima facie evidence that the BIDDER has made such examination.

If awarded the Contract, the undersigned agrees to commence the Work under the Contract **WITHIN TEN (10) WORKING DAYS AFTER DATE OF CONTRACT, AND COMPLETE SAID WORK WITHIN FORTY (40) WORKING DAYS** from the first day of commencement of such work unless legal extension is granted in accordance with the terms set forth in the specifications, and to perform and complete the Work as shown on the Plans and in accordance with the Specifications and other Contract Documents, and to furnish all labor, materials, tools and equipment necessary to complete the Work in-place therefor, in the manner and time herein prescribed at the following prices, to wit:

BID SCHEDULE PROPOSAL

ITEM #	BID ITEM DECRIPTION	QTY.	UNIT	UNIT PRICE (in figures)	ITEMS TOTAL (in figures)
LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES:					
1	All Labor, Parts, Materials, Equipment, Deliveries, Setup, Mobilization, etc., to Fully Install and Operate City-Furnished Light-Emitting Diode (LED) Lights at the Following City Parks and Athletic Facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex	1	L.S.		

TOTAL BID PROPOSAL FIGURES: $

TOTAL BID PROPOSAL (Words):

_____

_____

The award of the Contract shall be based on the lowest responsive Bid amount, and the City reserves the right to delete one or more bid items and/or to increase and/or to decrease bid items' quantities.

The CITY also reserves the right to reject all Bids.

_____
Bidder's Initials

PROPOSAL BID SCHEDULE (CONTINUED)

NOTES:

1. The accuracy of estimate quantities as shown is not guaranteed; the Bidder shall make his/her own estimate from the drawings and field review for verification. If the unit price and the total amount are different, the unit price will control the bid. Payment shall be based on actual work done and/or actual quantities used.

2. The City reserves the right to delete one or more bid items and/or to increase or decrease bid items' quantities, at no additional cost to the City.

3. FA designates force account. Payment shall be made on a time and materials basis, only if directed by the ENGINEER.

4. (F) Designates Final Pay Item. When an item of work is designated as "FINAL PAY ITEM" in the Specifications, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions. If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

   The estimated quantity for each item of work designated as "FINAL PAY ITEM" in the Specifications, shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.

   In case of discrepancy between the quantity shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown in the Engineer's Estimate.

5. Bidder declares that it has read and understands Items 14 & 15 of Information for Bidders (Page B-2 and B-3).

6. Bidder agrees to initial or notarize (if applicable) all pages on P-1, P-1a, P-1b, P1-c, and through P-11 uploaded onto *PlanetBids*.

_____
Bidder's Initials

PROPOSAL SCHEDULE
(CONTINUED)

(Please Type or Print)

Total Amount for Base Bid (in written words) _____

_____ ($_____)
in figures

Contractor's Lawful Name: _____

Bidder's Name: _____ Bidder's Initials: _____

Contractor's License No. _____ Expiration: _____

Contractor's Taxpayer I.D. Number: _____

Contractor's DIR Registration Number:_____

Signature: _____ Date: _____

Contractor's Address: _____

_____

Telephone Number:(_____)_____ Mobile No.:(_____)_____

Fax Number: (_____)_____ E-mail:_____

24-Hour Emergency Contacts:

_____ Telephone Number: (_____)_____
Name
Mobile No.: (_____)_____

_____ Telephone No.: (_____)_____
Name
Mobile No.: (_____)_____

_____ Telephone No.: (_____)_____
Name
Mobile No.: (_____)_____

_____
Bidder's Initials

PROPOSAL SCHEDULE
(CONTINUED)

The Contractor agrees that the City will not be held responsible if any of the approximate quantities shown in the foregoing proposal shall be found incorrect, and he shall not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work as estimated and the work actually done. If any error, omission or misstatements shall be discovered in the estimated quantities, it shall not invalidate this contract or release the Contractor from the execution and completion of the whole or part of the work herein specified, in accordance with the specifications and the plans herein mentioned and the prices herein agreed upon and fixed therefore, or excuse him from any of the obligations or liabilities hereunder, or entitle him to any damages or compensation otherwise than as provided for in this contract.

The Contractor agrees that the City shall have the right to increase or decrease the quantity of any bid item or portion of the work or to omit portions of the work as may be deemed necessary or expedient, and that the payment for incidental items or work, not separately provided in the proposal shall be considered included in the price bid for other various items or work.

Accompanying this proposal is "Cash," "Certified Check," or "Bidder's Bond" (circle one) in the amount of _____ ($_____) equal to at least ten (10%) percent of the total bid price, payable to the City of Costa Mesa, to guarantee that within fourteen (14) days after written notice is deposited in the mail, or the bidder has received notice by telephone, the bidder will furnish proper Certificates of Insurance, and required bonds satisfactory to the City and execute a contract in accordance with the proposal and in the manner and form required by the contract documents.

The undersigned deposits the above-named security as a proposal guarantee and agrees that it shall be forfeited to the City of Costa Mesa as Liquidated Damages if the above requirements are not complied with.

_____
Bidder's Initials

Respectfully Submitted,

Contractor's Business Name	Contractor Title
Business Address: Street	Singed By Title
City State Zip	Contractor's License No. and Classification Exp. Date
Business Phone Number	Date
Name Title	Residence: Street
City State Zip	Residence phone Number

If the bid is by a corporation, state the names of the officers who can sign an agreement on behalf of the corporation and whether more than one officer must sign.

☐ Corporation Taxpayer I.D. Number: _____

	Can Sign	Must Sign
Name_____	☐	☐
Name_____	☐	☐
Name_____	☐	☐

If the bid is by a partnership or a joint venture, state the names and addresses of all general partners and joint ventures.

☐ Partnership or Joint Ventures Taxpayer I.D. Number: _____

Name _____

Address _____

Name _____

Address _____

If the bidder is a sole proprietorship or another entity that does business under a fictitious name, the bid shall be in the real name of the bidder with a designation following showing "DBA (the fictitious name)"; provided, however, no fictitious name shall be used unless there is a current registration with the Orange County Recorder.

The full names and residences of all persons and parties interested in the foregoing proposal, as principals, are as follows:

NOTE: Give first and last names in full; in case of corporation, give names of President, Secretary, Treasurer and Manager, and affix corporate seal; in case of partnerships and joint ventures, give names of all the individual members.

_____
Bidder's Initials

Bidder shall signify receipt of all Addenda here, if any:

Addendum No.	Date Received	Bidder's Signature

CONSTRUCTION PROJECT REFERENCES

In order to more fully evaluate your firm's background and experience for the project herein proposed, it is requested that you submit a list of Public Works and/or similar construction projects completed, or in progress, within the last 24 months. This information will be used to evaluate whether the bid is responsive and or responsible to the call for bids.

Date Project Awarded	Awarding Agency	Agency's Contract Administrator Contact Information

_____
Bidder's Initials

DESIGNATION OF SUBCONTRACTORS

In compliance with the "Subletting and Subcontracting Fair Practices Act" being Sections 4100-4113 of the Public Contract Code of the State of California, and any amendments thereto, each bidder shall set forth below the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement in an amount in excess of one-half (½) of one percent (1%) of the prime contractor's total bid or in the case of bids for the construction of streets or highways, including bridges, in excess of one-half (½) of one percent (1%) of the prime contractor's total bid or ten thousand ($10,000) dollars, whichever is greater. Bidder shall further set forth the portion of the work, which will be done by each such subcontractor with its Department of Industrial Relations (DIR) registration number. Only one subcontractor for each such portion shall be listed.

If the contractor fails to specify a subcontractor for any portion of the work to be performed under the contract, he/she/it shall be deemed to have agreed to perform the balance of all work, which is not covered, and he/she/it shall not be permitted to subcontract that portion of the work except under the conditions hereinafter set forth.

Subletting or subcontracting of any portion of the work to which no subcontractor was designated in the original bid, shall only be permitted in cases of public emergency or necessity, and then only after a finding reduced to writing as a public record of the Legislative Body of the Owner.

All information must be filled out and typed. Please use additional pages in this format if needed.

Bid Item (s) Number	***% Portion of Work***	***Name, Address and E-mail of Subcontractor***	***State License Number***	***Class***	***DIR Registration Number***

By submission of this proposal, the Bidder certifies:

1. That (I)(we)(it) is able to and will perform the balance of all work which is not covered in the above subcontractors listing.

2. That the AGENCY will be furnished copies of all subcontracts entered into by subcontractor for this project.

_____
Bidder's Initials

BIDDER'S BOND TO ACCOMPANY PROPOSAL

(Required if the bidder desires to submit bond instead of a certified or cashier's check.)

KNOW ALL PEOPLE BY THESE PRESENTS:

That we,_____ as principals, and _____ as surety, are held and firmly bound unto the City of Costa Mesa, a municipal corporation, organized under the laws of the State of California and situated in Orange County in the sum of _____ ($_____) to be paid to the City, its successors and assigns, for which payment well and truly to be made, we bind ourselves, our heirs, executors, and administrators, successors or assigns, jointly and severally firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH,

That is the certain proposal of the above bounden, _____, if accepted by the City of Costa Mesa, and if the above bounden, _____, his heirs, executors, administrators, successors and assigns, shall duly enter into and execute a contract for such construction, and shall execute and deliver the CERTIFICATE OF INSURANCE and the LABOR AND MATERIAL and the FAITHFUL PERFORMANCE BONDS described within fourteen (14) days from the date of the mailing of a notice of the above bounden, _____, by and from the City, that said contract is ready for execution, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

IN WITNESS WHEREOF:

We hereunto set our hands and seals this _____ day of _____, 20__.

_____	_____
_____	_____
_____	_____
Contractor/ Principal (Notary Acknowledgement to be attached)	Surety/Power of Attorney (Notary Acknowledgment to be attached)

_____
Bidder's Initials

CONTRACT ASSURANCE

The CONTRACTOR or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The CONTRACTOR shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the CONTRACTOR to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as recipient deems appropriate.

The CONTRACTOR will require that the above provision is included in all subcontracts.

_____
Bidder's Initials

NONCOLLUSION AFFIDAVIT

The bidders, by its officers and agents or representatives present at the time of filing this bid, being duly sworn on their oaths say, that neither they nor any of them have in any way directly or indirectly entered into any arrangement or agreement with any other bidder, or with any public officer of such CITY OF COSTA MESA whereby such affiant or affiants or either of them has paid or l s to pay to such bidder or public officer any sum of money, or has given or is to give to such other bidder or public officer anything of value whatever, or such affiant or affiants or either of them has not directly or indirectly, entered into any arrangement or agreement with any other bidder or bidders, which tends to or does lessen or destroy free competition in the letting of the contract sought for on the attached bids; that no bid has been accepted from any subcontractor or supplier through any bid depository, the By-Laws, Rules, or Regulations of which prohibit or prevent the Contractor from considering any bid from any subcontractor or supplier which is not processed through said bid depository, or which prevent any subcontractor or supplier from bidding to any Contractor who does not use the facilities or accept bids from or through such bid depository; that bidder has not bid as subcontractor to other bidders; that no inducement of any form or character other than that which appears upon the face of the bid will be suggested, offered, paid or delivered to any person of the contract, nor has this bidder any agreement or understanding of any kind whatsoever, with any person whomsoever to pay, deliver to, or share with any other person in any way or manner, any of the proceeds of the contracts sought by this bid.

_____
Contractor Firm Name

_____
Name of Principal

_____
Title

_____
Signature

Subscribed and sworn to before me by:

_____

This ____ day of _____, 20___.

My Commission Expires: _____

_____ _____

Notary Public Bidder's Initials

CONTRACTOR'S CERTIFICATION
OF
WORKERS' COMPENSATION INSURANCE REQUIREMENTS
FOR
PUBLIC WORKS PROJECTS
(Labor Code §1861)

I am aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this contract.

Dated: _____

CONTRACTOR

_____

_____
Company Name

PROJECT: LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09

_____
Bidder's Initials

DRUG-FREE WORKPLACE POLICY

CONTRACTOR, upon notification of contract award, shall establish a Drug-Free Awareness Program to inform employees of the dangers of drug abuse in the workplace, the penalties that may be imposed upon employees for drug abuse violations occurring in the workplace, and the employee assistance programs available to employees. Each employee engaged in the performance of a CITY contract must be notified of this Drug-Free Awareness Program, and must abide by its terms. Failure to establish a program, notify employees, or inform CITY of a drug-related workplace conviction will constitute a material breach of contract and cause for immediate termination of the contract by CITY.

CONTRACTOR shall conform to all the requirements of CITY'S Policy No. 100-5. A copy of this policy is attached to the sample contract agreement as an attachment in the Project Specifications.

_____
Bidder's Initials

BIDDER/APPLICANT/CONTRACTOR CAMPAIGN

CONTRIBUTION DISCLOSURE FORM

Proposer/Consultant/Applicant is required to identify any campaign contribution or cumulative contributions greater than $249 to any city council member in the twelve months prior to submitting an application, proposal, statement of qualifications or bid requiring approval by the City Council.

Date	Name of Donor	Company/Business Affiliation	Name of Recipient	Amount

Except as described above, I/we have not made any campaign contribution in the amount of $250 or more to any Costa Mesa City Council Member in the twelve months preceding this Application/Proposal.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

_____
Bidder/Applicant/Proposer

_____
Date

_____
Bidder's Initials

GENERAL PROVISIONS

SECTION 1 – GENERAL

1-2 GENERAL

[Add the following:].

Except as hereinafter provided, the provisions of the latest edition of the Standard Specifications for Public Works Construction (“Green Book”), and all amendments thereto, adopted by the Joint Cooperative Committee of Southern California Chapter, American Public Works Association, Southern California District and Associated Contractors of California; hereinafter referred to as Standard Specifications, are adopted as the "Standard Specifications of the City of Costa Mesa" and shall be considered as a part of these specifications. Copies of the Standard Specifications are available from the publisher:

BNi Building News

1612 S. Clementine Street

Anaheim, California 92802

(714) 517-0971

Where specified in these specifications, the latest edition of the California Building Code, based on the latest edition of the International Building Code, the latest edition of the "Standard Specifications and Standard Plans of the State of California, Department of Transportation, Division of Highways," "Standard Plans of the Orange County Environmental Management Agency," and "Los Angeles County Flood Control District, Design Manual, Standard Drawings" shall apply or unless otherwise noted in these specifications or at the direction of the ENGINEER.

Where referenced in these Specifications, the latest edition of the “City of Costa Mesa Standard Drawings” and the “Work Area Traffic Control Handbook (WATCH)” published by Building News, Inc., shall also apply.

The section numbers of these General Provisions coincide with those of the said Standard Specifications. Only those sections requiring amendment, elaboration, or specifying options, are called out.

The following modifications are made to the "Standard Specifications." If there is a conflict between the "Standard Specifications" and these modifications, these modifications shall have first precedence.

1-2 TERMS AND DEFINITIONS

[Add or redefine the following:].

(a) AGENCY	The City of Costa Mesa, California, hereinafter referred to as "CITY."
(b) BOARD	The City Council of the City of Costa Mesa, California, hereinafter referred to as "BOARD."
(c) CONTRACT DOCUMENTS	Documents including but not limited to the following: The proposal form P-1 through P-9b, Notice Inviting Bids, Standard Specifications, General Provisions, Special Provisions, Plans, Bonds, Insurance Certificates, Agreement, and all Addenda setting forth any modifications of the documents as further specified in contract agreement.
(d) ENGINEER	The administrating officer of the City of Costa Mesa or his authorized representative hereinafter referred to as ENGINEER.
(e) BIDDER	Any individual, firm, partnership, corporation, or combination thereof, submitting a bid proposal for the work contemplated in the contract documents, acting directly or through a duly authorized representative, hereinafter referred to as BIDDER.
(f) LEGAL ADDRESS OF CONTRACTOR	The legal address of the Contractor shall be the address given on the Contractor's bid and is hereby designated as the place to which all notices, letters or other communications to the Contractor shall be mailed or delivered.
(g) LABORATORY	An established laboratory approved and authorized by the ENGINEER for testing materials and work involved in the contract.

1-3 ABBREVIATIONS

CALTRANS	State of California, Department of Transportation, Division of Highways
O.C.E.M.A.	Orange County Environmental Management Agency
L.A.C.F.C.D.	Los Angeles County Flood Control District

1-6 BIDDING AND SUBMISSION OF THE BID

1-6.1 General

[Add the following:].

Proposal shall be made and submitted on proposal forms P-1 through P-9a in accordance with the Notice Inviting Bids. In addition to the required signatures in the spaces provided in the proposal forms, each BIDDER shall initial each sheet of the proposal forms at the bottom right hand corner.

No person, firm, partnership, corporation, or combination thereof shall be allowed to make or file or be interested in more than one bid for the same work, unless alternate bids are called for. A person, firm, partnership, corporation, or combination thereof who has submitted a sub-proposal to a BIDDER or who has quoted prices on materials to a BIDDER is not thereby disqualified from submitting a sub-proposal to or quoting prices to the other bidders. If, on the opening of bids, more than one bid appears in which the same person, firm, partnership, corporation or combination thereof is interested as a principal, all such bids shall be rejected.

Proposals with interlineations, alterations, or erasures shall be initialed by the BIDDER'S authorized agent. Alternative proposals, special conditions, or other limitations or provisions affecting the bid, except as such called for in the contract documents, will render the bid informal and may cause its rejection.

All proposals must give the prices bid for the various items of work and must be signed by the BIDDER, who shall give his address. Each bid shall have thereon the affidavit of the BIDDER that such bid is genuine and not sham nor collusive, nor made in the interest nor behalf of any other person not therein named and that the BIDDER has not directly nor indirectly induced or solicited any other BIDDER to put in a sham bid, nor induced nor solicited any person, firm, partnership, corporation, or combination thereof to refrain from bidding, and that the BIDDER has not in any manner sought by collusion to secure himself an advantage over any other BIDDER.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

1-6.1.1 Request for Interpretation

If any person contemplating submitting a bid is in doubt as to the meaning of any part of the Plans, Specification, or other proposed Contract Documents, or finds discrepancies in, or omissions from the drawings or specifications, (It, he, she) may make a request to the ENGINEER, in writing, for an interpretation or correction thereof pursuant to the provisions in the Information for Bidders section of these specifications. The person

submitting such a request shall be responsible for its prompt delivery. All such interpretations of the Contract Documents will be made only by addenda duly issued, and a copy of each such addendum will be mailed or delivered to each person receiving a set of Contract Documents at (its, his, her) last address of record. The CITY will not be responsible for any other explanations or interpretations of the Contract Documents.

1-6.1.2 Soil Conditions

The BIDDER shall inspect the soil conditions before submitting a bid. By submitting a bid, the BIDDER acknowledges that he is satisfied with the quality of the work area including but not restricted to the conditions affecting, handling and storage of materials, disposal of excess materials, and the soil conditions.

1-6.1.3 Return of Bid Security

Any BIDDER may withdraw its bid, either personally, or by telegraphic or written request, at any time prior to the scheduled closing time for the receipt of bids. It is the sole responsibility of the BIDDER to see that any such telegraphic or written request is delivered to the City Clerk prior to said closing time. Bid security of such BIDDERS will be returned promptly to the BIDDER.

The bid security of the BIDDER whose bid is accepted will be held by the CITY until the contract has been executed and the accompanying insurance certificates, performance bond and labor and materials bond are approved and filed, whereupon the bid security will then be returned to the BIDDER.

The bid security of the second and third lowest BIDDERS will be retained until the contract is awarded to and executed by the BIDDER whose bid is accepted, or until 45 days after the opening of bids, whichever period is shorter. The bid security of all BIDDERS other than the three lowest will be returned promptly after the opening of bids.

If a BIDDER fails or refuses promptly to execute the agreement to do the work or fails or refuses to comply with insurance and bonding requirements, the bid security shall be forfeited to the CITY and shall be collected and paid into the General Fund of the CITY.

1-6.2 Subcontractor Listing

[Add the following:].

The ENGINEER, as duly authorized officer, may consent to subcontractor substitution requested by the Contractor subject to the limitations and notices prescribed in Section 4107 of the Public Contract Code.

1-7 AWARD AND EXECUTION OF THE CONTRACT

1-7.1 General

[Add the following:].

The award of contract, if awarded, will be to the lowest responsive and responsible bidder whose proposal complies with all requirements of the Notice Inviting Bids and Section 1-6 of these specifications. The BIDDER, upon notification as the "apparent low bidder," shall comply with the CITY'S insurance and bonding requirements by submitting the required insurance certificates and bonds within **fourteen (14) days after the mailing of a Notice of Award to the BIDDER that the contract is ready for execution**. The contract will be awarded within thirty (30) days of receipt of properly approved insurance certificates and bonds pursuant to CITY requirements spelled out in these specifications. BIDDER must take particular note of "insurance requirements" contained in these specifications and sample agreement included within the contract documents, and should provide that information to his insurance broker in order that a properly executed certificate is submitted. The CITY, however, reserves the right to reject any or all bids and to waive any informality in the bids received.

1-7.1.1 Execution of Agreement

The Agreement shall be signed by the successful BIDDER and returned to the CITY no later than **fourteen (14) days from Notice of Award** of the Contract by the CITY. Failure to comply with insurance and bonding requirements as specified in the Agreement and in Section 1-7.1 of these General Provisions shall be considered grounds for the revocation and rejection of the bid and forfeiture of bid security. No proposal shall be considered binding upon the CITY until the execution of the agreement by the CITY. In case of conflict, the agreement shall have precedence over all other written specifications.

1-7.2 Contract Bonds

[Add the following:].

The "Faithful Performance Bond" and the "Labor and Material Bond" as specified in this section shall be for one hundred percent (100%) of the Contract price. The Labor and Material Bond shall be maintained by the Contractor in full force and effect for at least seven (7) months following the filing of the Notice of Completion. The Faithful Performance Bond shall also be kept by the Contractor in full force and effect for at least one (1) year following the filing of the Notice of Completion.

CONTRACTOR shall provide the following:

A certified copy of the certificate of authority of the surety issued by the Insurance Commissioner.

A certificate from the clerk of the county in which the court or officer is located that the certificate of authority of the surety has not been surrendered, revoked, canceled, annulled, or suspended or, in the event that it has, that renewed authority has been granted.

Copies of the surety's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with Section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code.

1-8 SPECIAL PROVISIONS – ECONOMIC SANCTIONS AGAINST THE RUSSIAN FEDERATION EXECUTIVE ORDER N-6-22

[Add the following:].

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. The EO directs state agencies to terminate contracts with, and to refrain from entering any new contracts with, individuals or entities that are determined to be a target of Economic Sanctions. This Executive order extends to recipients of any State Grants (Grantee). Grantees include those who have contracted or will contract to receive State grants funds. Accordingly, should the State determine that a Grantee is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this agreement. The State shall provide the Grantee advance written notice of such termination, allowing the Grantee at least 30 calendar days to provide a written response. Termination of any contract found to be in violation of this Executive Order shall be at the sole discretion of the State.

SECTION 2 – SCOPE OF THE WORK

2-1 WORK TO BE DONE

[Replace in its entirety with the following:].

The scope of work generally consists of all labor, parts, materials, equipment, deliveries, setup, mobilization, etc., to fully install and operate City-furnished light-emitting diode (LED) lights at the following City parks and athletic facilities: Bark Park, Jack R. Hammett Sports Complex, Costa Mesa Tennis Center, and the TeWinkle Park Athletic Complex, and as shown on the Plans and specified within these Contract Documents. The CONTRACTOR shall furnish all labor, materials, tools, equipment and incidentals necessary to perform and complete the Work as shown on the Plans and these Contract Documents, and to the satisfaction of the ENGINEER.

2-2 PERMITS

[Add the following:].

All permits and licenses shall be obtained in sufficient time to prevent delays to the work.

In the event that the CITY has obtained permits, licenses or other authorizations applicable to the work, the Contractor shall comply with the provisions of said permits, licenses and other authorizations.

2-5 THE CONTRACTOR'S EQUIPMENT AND FACILITIES

2-5.1 General

[Add the following:].

The Contractor shall only use the proper construction equipment to protect the City streets from breaking up and deterioration. Haul trucks shall be limited to a gross vehicle weight of 10 tons or less.

2-5.2 Temporary Utility Services

[Add the following:].

The Contractor shall provide for his employees an adequate supply of clean, potable drinking water, which shall be dispensed through approved sanitary facilities.
If water is needed during construction, Contractor shall contact Mesa Consolidated Water District or the Irvine Ranch Water District to obtain necessary permits, instructions, and meters prior to commencing work. The Contractor is required to make any and all necessary installations and connections. All water shall be metered. The Contractor shall pay for all deposits and fees involved.

2-5.4 Haul Routes

[Add the following:].

In order to protect the City streets from deterioration due to hauling of materials, the Contractor shall submit to the ENGINEER (at the pre-construction meeting) for approval, a proposed route for the hauling of materials for disposal. Upon approval, the Contractor shall strictly adhere to that route only, unless written permission from the ENGINEER is obtained to change the route.

Waste Hauler Requirements

The California Green Building Standards Code, 2016 Edition, California Code of Regulations, Title 24, Part 11, impacting waste diversion as documented in the City of Costa Mesa's Municipal Code Chapter 4 of Title 8, requires that all construction and demolition related projects divert 65% of project waste generated from the landfill. Consequently, permitted building projects relating to construction and demolition, newly constructed buildings, additions, alterations, interior and exterior demolitions, etc., are required to divert a minimum of 65% of nonhazardous construction and demolition waste from the landfill by recycling, reuse, or salvage. Generally, these materials include brick, drywall, other masonry, cardboard, green waste, paper, carpet, lumber, plastic, concrete, and/or metals. Asphalt, concrete, excavated soil and land-clearing debris should be 100% diverted from disposal. The County provides a suggested list of locations that are meeting and/or exceeding the 65% diversion requirement and may be used for recycling construction and demolition material.

The City of Costa Mesa requires that all hauling activity in Costa Mesa comply with one of the waste hauling options for your construction and demolition related project:

- Use Franchise Waste Hauler
- Self-Haul Permit - https://www.costamesaca.gov/city-hall/city-departments/public-services/waste-collection-and-recycling

A Construction and Demolition Reporting Form as provided in the Miscellaneous Document Section of these Specifications must be completed and submitted by the Contractor to the CITY prior to the release of retention monies.

2-7 CHANGES INITATED BY THE AGENCY

2-7.1 GENERAL

[Add the following:].

ENGINEER shall be the duly authorized officer of the CITY who may grant the changes prescribed in this section.

2-8 EXTRA WORK

[Add the following:].

The extra work as defined in this section of the Standard Specifications and any work done by the Contractor beyond the lines and grades shown on the plans shall only be performed when ordered in writing by the ENGINEER. In absence of such written order, any such work by the Contractor shall be considered unauthorized and will not be paid. Work so done may be ordered to be removed at the Contractor's expense.

2-9 CHANGED CONDITIONS

[Add the following:].

The Contractor shall promptly act to supply all information to the ENGINEER for proper evaluation. Failure to do so shall constitute a waiver of any payment for delays suffered by the Contractor.

SECTION 3 – CONTROL OF THE WORK

3-1 ASSIGNMENT

[Replace the 1st sentence with the following:].

No contract or portion thereof may be assigned without written consent of the BOARD.

3-4 AUTHORITY OF THE BOARD AND THE ENGINEER

[Add the following:].

When any of the various units or operations of the work have been suspended, the Contractor shall give at least 24 hours advance notice of the time when he or his subcontractor will start or resume any of such units or operations. That notice is to be given during working hours, exclusive of Saturdays, Sundays or holidays, for the purpose of permitting the ENGINEER to make necessary assignments to his representative on the work.

Any work performed in conflict with said notice, without the presence or approval of the ENGINEER, or work covered up without notice, approval or consent may be rejected or ordered to be uncovered for examination at Contractor's expense and shall be removed at Contractor's expense, if so ordered by the ENGINEER or his representative on the work. Any unauthorized or defective work, defective material or workmanship or any unfaithful or imperfect work that may be discovered before the final payment and final acceptance of work shall be corrected immediately by the Contractor without extra charge even though it may have been overlooked in previous inspections and estimates or may have been caused due to failure to inspect the work.

All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made on any plan or drawing by the Contractor after the same has been approved by the ENGINEER, except by direction of the ENGINEER in writing. Deviations from the approved plans, as may be required by critical conditions of construction, must be authorized in writing by the ENGINEER.
All instructions, rulings and decisions of the ENGINEER shall be in writing and are binding on all parties unless a formal protest is made as provided in the following paragraph:

If the Contractor considers any work demanded of him to be outside the requirements of the contract, or if he considers any instruction, ruling or decision of the ENGINEER or ENGINEER'S representative to be unfair, the Contractor shall, within ten (10) days after any such demand is made, or instruction, ruling or decision is given, file a written protest with the ENGINEER, stating clearly and in detail his objections and reasons therefor. Except for such protests and objections as are made of record, in the manner and within the time above stated, the Contractor shall be deemed to have waived and does hereby waive all claims for extra work, damages and extensions of time on account of demands, instructions, rulings and decisions of the ENGINEER.

Upon receipt of any such protest from the Contractor, the ENGINEER shall review the demand, instruction, ruling or decision objected to and shall promptly advise the Contractor, in writing, of his final decision, which shall be binding on all parties, unless within the ten (10) days thereafter the Contractor shall file with the BOARD a formal protest against said decision of the ENGINEER. The BOARD shall consider and render a final decision on any such protest within thirty (30) days of receipt of same. If the BOARD fails to consider and render a final decision on any such protest within thirty (30) days of receipt of the same, the protest shall be deemed denied.

3-5 INSPECTION

[Add the following:].

If the Contractor requests and receives approval from the ENGINEER to receive inspection services from the CITY outside of a normal eight (8) hour day/forty (40) hour work week or on Saturday, Sunday, or CITY holidays, the Contractor shall arrange with the CITY and ENGINEER for the special inspection services and Contractor shall pay for such special inspection services at a fee established by the ENGINEER to defray the cost for such service.

All work, which has been inspected and deemed defective in its construction or does not meet all of the requirements of the plans and/or specifications by the ENGINEER shall be remedied, or removed and replaced by the Contractor in an acceptable manner, and no compensation will be allowed for such correction.

Any work done beyond the limits of the lines and grades shown on the plans or established by the ENGINEER or extra work done without written authority will be considered as unauthorized and not be paid.

Upon failure on the part of the Contractor to comply with any order of the ENGINEER made under the provisions of this article, the ENGINEER shall have authority to cause defective work to be remedied, or removed and replaced, and unauthorized work to be removed, and to deduct the costs and thereof from any monies due or to come due the Contractor.

Payment will not be made for materials wasted or disposed of in a manner not called for under the Contract. This includes rejected material not unloaded from vehicles, material rejected after is has been placed and material placed outside the limits of the project. No compensation will be allowed for disposing of rejected or excess material.

3-6 THE CONTRACTOR'S REPRESENTATIVE

[Add the following:].

Contractor shall file with the ENGINEER the addresses and telephone numbers where its designated representative may be reached during hours when the work is not in progress.

Instructions and information given by the ENGINEER to the Contractor's authorized representative or at the address or telephone numbers filed in accordance with this section shall be considered as having been given to the Contractor.

The Contractor shall have on the work site at all times a competent English-speaking superintendent, as his agent, capable of reading and thoroughly understanding the plans and specifications and other related documents.

3-7 CONTRACT DOCUMENTS

3-7.1 General

[Add the following:].

Contractor will obtain from the ENGINEER, free of charge, copies of plans, general provisions, special provisions and additions to the Standard Specifications that are reasonably necessary for the execution of work.

Contractor shall, at its own expense, obtain copies of the Standard Specifications and Standard Plans and Specifications of CALTRANS, for his general use.

If after the Contract is awarded it appears that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained in the specifications and plans, the

Contractor shall apply to the ENGINEER for such further explanations as may be necessary and shall conform to such explanation or interpretation as part of the Contract.

All scaled dimensions are approximate. Before proceeding with the work, the Contractor shall carefully check and verify all dimensions and quantities and shall immediately inform the ENGINEER or his representative of any discrepancies.

3-10 SURVEYING

[Replace with the following:].

3-10.1 General

The Contractor will perform and be responsible for the accuracy of setting all required survey stakes adequate for the construction of the project.

3-10.3 Line and Grade

Unless otherwise provided in the Special Provisions, lines and grades for construction shall be the responsibility of the Contractor, with the following provisions:

All work under this Contract shall be built in accordance with the lines and grades shown on the plans. Field survey for establishing the lines and grades and for the control of construction shall be the responsibility of the Contractor. All such surveys, including construction staking, shall be under the supervision of a California-licensed land surveyor or by a California-licensed civil engineer allowed by law. Staking shall be performed on all items ordinarily requiring grade and alignment, at intervals normally accepted by the agencies and the trade involved.

The Contractor shall provide a copy of the office calculations and grade sheets to the City Inspector. The Contractor shall be responsible for any error in the finished work and shall notify the ENGINEER within one (1) working day of any discrepancies or design errors discovered during staking.

Unless a separate bid item is provided, the payment for surveying, construction staking, professional services, office calculations, furnishing all labor, materials, equipment, tools and incidentals, and for doing all work involved shall be considered as included in the various items of work, and no additional compensation will be allowed.

3-12 WORK SITE MAINTENANCE

3-12.1 General

[Replace 2nd paragraph with the following:].

Unless the construction dictates otherwise, and unless otherwise approved by the ENGINEER, Contractor shall furnish and operate a self-loading motor sweeper with a functional water spray nozzle system at least once each working day to keep paved areas in the Work zone and along all haul routes acceptably clean whenever construction, including restoration, is incomplete.

3-12.2 Air Pollution Control

[Add the following:].

Failure of the Contractor to comply with the ENGINEER'S dust control orders may result in an order to suspend work until the condition is corrected and, after giving notice to the Contractor, the ENGINEER may order the condition corrected by others. All costs thus incurred shall be deducted from the amount to be paid to Contractor. No additional compensation will be allowed as a result of such suspension.

No separate payment will be made for any work performed nor material used to control dust resulting from Contractor's performance of the work or from public traffic, either inside or outside the right-of-way. Full compensation for such dust control will be considered to be included in the prices paid for the various items of Work involved.

3-12.4.1 General

[Add the following:].

All surplus materials shall be removed from the site of the Work within five (5) days after completion of the Work causing the surplus materials.

3-12.6 Water Pollution Control

3-12.6.1 General

[Add the following:].

Discharge of storm water from construction sites that disturb land equal to or greater than one (1) acre must be in compliance with the state General Construction Activity Permit (Construction Permit). The latest permit provisions of the Construction Permit shall apply. The Contractor is required to contact the Santa Ana Regional Water Quality Control Board (Regional Board) for all information contained in the Construction Permit. In the event project construction occurs during the transition of revised Construction Permits, the Contractor shall incorporate the necessary modifications specified by the revised Construction Permit within the time period specified in the new Construction Permit.

Project Soil Disturbance is: **less than 1 acre** (No General Construction Permit required)

Construction activity subject to the Construction Permit includes clearing, grading, disturbance to the ground such as stockpiling, work area, or excavation that results in soil disturbances of at least one acre of total land area. Construction activity that results in soil disturbances of less than one acre is subject to the Construction Permit if the construction activity is a part of a larger common plan of development that encompasses one or more acres of soil disturbance or if it is determined that discharges from the project pose a significant threat to water quality.

The CONTRACTOR shall have an account with the State for SMARTS (Storm Water Multiple Application and Report Tracking System). The CONTRACTOR shall contact the

CITY with their user ID so that the CITY will grant the CONTRACTOR access as a Data Submitter.

The CONTRACTOR shall complete the NOI within SMARTS https://smarts.waterboards.ca.gov/smarts/faces/SwSmartsLogin.jsp The CONTRACTOR will notify the CITY when the NOI is ready for the CITY to submit to the State. The CONTRACTOR shall pay all fees associated with the NOI process. The CONTRACTOR shall also complete all required reports within SMARTS as required by the General Permit and the Project's Storm Water Pollution Prevention Plan (SWPPP).

The CONTRACTOR shall complete the Annual Report and NOT within SMARTS. Once the CITY has been notified, the CITY will review and submit to the State for processing. A copy of the latest permit is available at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

The CONTRACTOR is hereby directed to read the Construction Permit thoroughly and comply with the requirements as specified therein.

3-12.6.2 Best Management Practices (BMPs)

[Add the following:].

The Contractor shall install and maintain the appropriate Best Management Practices (BMPs) to protect water quality within the project limits through the duration of the Project.

The Contractor shall be responsible for any damage to any portion of the Work occasioned by failure to provide proper drainage control prior to the completion and acceptance of the Work.

Payment for furnishing, installing and maintaining BMPs inclusive of sweeping the Project site as required or directed by the ENGINEER shall be included in the other various bid items associated with the work and no additional payment will be allowed thereof.

3-12.6.3 Storm Water Pollution Prevention Plan (SWPPP)

[Add the following:].

If a General Construction Permit is required pursuant to Section 3-12.6.1 of these General Provisions, the following Storm Water Pollution Prevention Plan (SWPPP) requirements shall be adhered to:

The Contractor is responsible for the preparation and implementation of a SWPPP as required by the Construction Permit. The Contractor is responsible for completing all parts of the SWPPP including, REAPs, monitoring, sampling, rain gauge records, weather reports, submitting pictures of every third storm, non-authorized discharge reports, Ad-Hoc reports, Annual Reports, post construction BMPs and other requirements of the SWPPP.

The completed SWPPP must be signed by a QSD (Qualified SWPPP Developer). The completed SWPPP must be submitted to the resident engineer for City review and acceptance, prior to uploading to SMARTS. The Contractor will be responsible for uploading an electronic format of the SWPPP into SMARTS. The SWPPP must be signed by the City before construction begins. A copy of the SWPPP must be available at the site at all times and must be implemented and revised in accordance with the Construction Permit throughout the duration of the project.

Contractor must have QSP (Qualified SWPPP Practitioner). Contractor shall perform site inspections before and after the storm event, and once each 24-hour period during extended storm event, to identify BMP effectiveness and implement repairs or BMP modifications as soon as possible. Sampling of potential pollutant discharges shall be conducted by trained personnel and required laboratory test conducted by laboratory accredited by the California Department of Health Services Environmental Laboratory Accreditation Program.

Contractor shall be responsible for any penalties assessed against the City if the penalty assessed is due to Contractor's violation of the Construction Permit requirement, or Contractor's failure to fully implement and monitor SWPPP as required.

Erosion and Sediment Control Plans

Erosion and Sediment Control Plans shall be prepared by the Contractor as part of the SWPPP that identify adequate controls to prevent erosion and discharge of sediment off-site. Payment for the Erosion and Sediment Control Plans shall be included as part of the SWPPP.

3-12.6.4 Dewatering

[Add the following:].

Unless otherwise directed in these Special Provisions, the Contractor shall provide and maintain ample means and devices with which to promptly remove and properly dispose of water entering the excavations or other parts of the work at all times during construction. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. The methods may include sump pumps, deep wells, well points, suitable rock or gravel placed below the required bedding for draining and pumping purposes, temporary pipelines, and other means.

Standby pumping equipment shall be on the job site. A minimum of one standby unit shall be available for immediate installation should any well unit fail. The design and installation of well points or deep wells shall be suitable for the accomplishment of the work. Drawings or details indicating the proposed dewatering system shall be submitted to the CITY for review.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property.

Conveyance of the water shall be such as to not interfere with traffic flow or treatment facilities operations. No water shall be drained into work built or under construction without prior consent of the ENGINEER.

Water shall be disposed of in such a manner as not to be a menace to the public health and such disposal shall be performed in accordance with Environmental Protection Agency and State Water Quality Control Board standards (NPDES permit). Any testing and reports required under NPDES permit shall be performed by the Contractor and submitted to the appropriate agency for approval at no additional cost to the CITY.

3-13.3 WARRANTY

[Replace 2nd sentence of 1st paragraph with the following:].

The warranty period shall start on the date the Work is accepted by the Board.

SECTION 4 – CONTROL OF MATERIALS

4-4 TESTING

[Add the following:].

All tests of materials furnished by the Contractor shall be made in accordance with commonly recognized standards of national organizations and such special methods and tests as are prescribed in these specifications. No materials shall be used until they have been approved by the ENGINEER.

The Contractor shall at his expense furnish the CITY, in triplicate, certified copies of all required factory and mill test reports. Any materials shipped by the Contractor from a factory or mill prior to having satisfactorily passed such testing and inspection by a representative of the CITY shall not be incorporated in the work, unless the ENGINEER shall have notified the Contractor, in writing, that such testing and inspection will not be required.

At the option of the ENGINEER, the source of supply of each of the materials shall be approved by the ENGINEER before delivery is started and before such material is used in the work.

Unless otherwise provided in the Special Provisions, the CITY will complete and pay for the initial soils, compaction, and material tests. Any subsequent soil, compaction, and material tests deemed necessary due to the failure of initial tests will be at the Contractor's expense and deducted from the payment due.

SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES

5-1 LAWS AND REGULATIONS

[Add the following:].

The Contractor shall protect and indemnify the CITY, the BOARD, the ENGINEER, and all of its or their officers, agents and servants against any claim or liability arising from or based on the violation of any existing or future State, Federal and local laws, ordinances, regulations, orders or decrees, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications or contract for the work in relation to any such law, ordinance, regulation, order or decree, the Contractor shall forthwith report the same to the ENGINEER in writing.

5-2 SPECIAL NOTICES

[Add the following:].

In addition to the special notices requirement to be served by Personnel Delivery or Certified Mail, special notices may also be served by the utilization of FedEx or UPS express service with a confirmed delivery receipt. Service shell be effective on the date of the receipt of the delivery confirm issued by FedEx or UPS.

5-3 LABOR

5-3.3 Payroll Records

[Add the following:].

In order to verify compliance with the Labor Code, Contractor shall furnish to the ENGINEER, weekly, for the duration of the contract period, copies of his payroll statements showing wages paid to each employee during the preceding week and the employee work classification. Use of Form DH-C-347, Payroll Statement of Compliance, is an acceptable method of fulfilling the above requirement.

5-3.5 Apprentices

[Replace with the following:].

Attention is directed to the provisions of Sections 1777.5 and 1777.6 of the Labor Code concerning the employment of apprentices by the Contractor or any subcontractor under it. The Contractor and any subcontractor under it shall comply with the requirements of those Sections in the employment of apprentices.

Information relative to apprenticeship standards, wage schedules and other requirements may be obtained from the Director of Industrial Relations, Ex-officio the Administrator of Apprenticeship, San Francisco, California, or from the Division of Apprenticeship Standards and its branch offices.

5-4 INSURANCE

[Replace with the following:].

The minimum amounts and types of insurance coverages are as stated in the Agreement (sample copy attached). Prior to bid submittal the BIDDER shall keep fully informed of the latest insurance requirements of the City of Costa Mesa and shall comply with all other provisions of Section 5-4 of the Standard Specifications.

Below are approved endorsements which satisfy the basic insurance requirements contained in contracts entered into by City of Costa Mesa. These have been approved by the City Attorney's office. The terms of any specific contract with the City are controlling. Prior to the commencement of any work, the CITY requires that the ENGINEER receive Certificates of Insurance in **DUPLICATE** for liability coverage of at least $1,000,000 combined single limit, per occurrence and in the aggregate.

Each insurance policy required by the CITY of the Contractor shall contain the following endorsements:

1. Additional Insureds

"The City of Costa Mesa and its elected and appointed boards, officers, agents, and employees are additional insureds with respect to the subject project and agreement."

2. Notice

"Said policy shall not terminate, nor shall it be canceled nor the coverage reduced, until thirty (30) days after written notice is given to City."

3. Other Insurance

"Any other insurance maintained by the City of Costa Mesa shall be excess and not contributing with the insurance provided by this policy."

If any of such policies provide for a deductible or self-insured retention to provide such coverage, the amount of such deductible or self-insured retention shall be approved in advance by City. No policy of insurance issued as to which the City is an additional insured shall contain a provision which requires that no insured except the named insured can satisfy any such deductible or self-insured retention.

5-7 SAFETY

5-7.1 Work Site Safety

5-7.1.1 General

[Add the following:].

Material or other obstructions shall not be placed within fifteen feet (15') of fire hydrants. Fire hydrants shall be made readily accessible to the Fire Department at all times.

5-7.8 Steel Plate Covers

5-7.8.1 General

[Add the following:].

All steel plate covers utilized for the project must be slide resistant. A non-slip coating will be required on the side of the steel plate that that will be utilized for the driving or walking surface.

SECTION 6 – PROSECUTION AND PROGRESS OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK

6-1.1 Construction Schedule

[Replace the 1st Paragraph with the following:].

The Contractor's proposed Construction Work Schedule shall be submitted to the ENGINEER for approval within ten (10) working days after the date of the BOARD's execution of the Contract Agreement. The Construction Work Schedule shall be supported by written statements from each supplier of materials or equipment indicating that all orders have been placed and acknowledged, and setting forth the dates that each item will be delivered. The Construction Work Schedule shall provide sufficient detail to delineate the main milestones start and end dates for each activity with chronological relationships of all the activities of Work showing the number of working days required to complete the entire project within the Contract Days. The schedule shall also incorporate the requirements of Section 402-5 of the Standard Specifications to complete the Work within the Contract Days. Prior to issuing the Notice to Proceed, the ENGINEER will schedule a preconstruction meeting with the Contractor to review the proposed Construction Work Schedule, delivery dates, activity milestone dates, arrange utility coordination, discuss construction methods and staging, and clarify inspection procedures.

The Contractor shall submit progress reports to the ENGINEER by the tenth day of each month. The report shall include an updated Construction Work Schedule. All revisions shall be completed within three days after review by the ENGINEER. The Contractor shall submit requests for changes in the schedule to the CITY for approval at least three (3) working days prior to performing any work. Any deviations from the original approved Construction Work Schedule shall be explained and identified in the updated Construction Work Schedule. Progress payments will be withheld pending receipt of any outstanding reports.

The Contractor shall furnish the ENGINEER with a 3-week look ahead-schedule in a tabular format at every weekly construction meeting. The 3-week look ahead schedule shall utilize the main milestones within the approved Baseline Construction Schedule with updates and include sub-activities.

[Add the following:].

6-1.3 DAILY REPORT SUBMITTAL

Contractor shall submit daily reports to the CITY at the end of each working day. All forms shall be provided by the CITY. Any cost for this item shall be included in the various items of work and no other compensation will be allowed.

6-3 TIME OF COMPLETION

6-3.1 General

[Replace the 1st Sentence with the following:].

The Contractor shall begin the Work within **ten (10) Working Days** after the date the Contract is executed by CITY unless a later start date is agreed upon by the CITY and Contractor within a written Notice-to-Proceed. The Work shall be completed within **FORTY (40) Working Days** from the date set in the Notice-to-Proceed or the first day of commencement of Work, whichever occurs first.

6-5 USE OF IMPROVEMENT DURING CONSTRUCTION

[Add the following:].

Should it become necessary, due to developed conditions, to occupy any portion of the Work before Contract is fully completed, such occupancy shall not constitute acceptance by the CITY of work by Contractor.

6-7 TERMINATION OF THE CONTRACT FOR DEFAULT

6-7.3 Notice of Termination for Default

[Replace the 1st Paragraph with the following:].

The ENGINEER will make the determination if the Contractor had failed to commence satisfactory corrective action within 5 working days after the receipt of the notice to cure, or to diligently continue satisfactory and timely correction of the default thereafter, and will take action as allowed by the Contract Documents.

6-7.4 RESPONSIBILITIES OF SURETY

[Add the following:].

Within 3 working days of receipt of the written notice of termination for default, the Surety shall provide the services needed to maintain the project in accordance with the Contract Documents. The services shall maintain the existing traffic control in place and the maintenance of the project site until the Engineer’s review and acceptance of the Surety’s plan for course of action.

6-9 LIQUIDATED DAMAGES

[Replace the 1ST Paragraph with the following:].

The CONTRACTOR shall pay to the CITY the sum of **$1,250** per calendar day, for each and every calendar day's delay in finishing the Work in excess of the number of Working Days prescribed within these General Provisions and the Agreement, or per the direction of the Engineer. Liquidated damages are calculated per Chapter 12 of the latest edition of the Caltrans Local Assistance Procedures Manual (LAPM).

SECTION 7 – MEASUREMENT AND PAYMENT

7-3 PAYMENT

7-3.1 General

[Replace the 1ST Paragraph with the following:].

Payment for the various items listed on the Bid Proposal, as further specified herein, shall constitute full compensation to the Contractor for furnishing all material, tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of Work and as specified and shown on the drawings, including all costs for compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the California Division of Industrial Safety and the Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor. No separate payment will be made for any item that is not specifically set forth in the Bid Proposal. Costs arising from violations of regulations will be paid by the offending party to the extent that there will be no additional cost to the CITY.

When no bid item is provided for work/improvement shown or indicated on the plans and specifications, payment for such work/improvement will be considered to be included in various applicable items of work.

7-3.2 Partial and Final Payment

[Replace the 1st Paragraph in its entirety with the following:].

The closure date for the purpose of making partial progress payments will be the last day of each month. The Contractor may request, in writing, that such monthly closure date be changed. The ENGINEER may approve such request when it is compatible with the CITY's payment procedure.

[Replace the 2nd Paragraph in its entirety with the following:].

Each month, the Contractor shall meet with the Engineer, a minimum of three (3) working days prior to the submittal of the progress payment to the AGENCY, to finalize and receive approval regarding the measurement of the Work performed through the closure date and the estimated value of the progress payment based on the Contract Unit Prices or as provided for in the Standard Specifications. Any progress payment submitted without such approval will be considered incomplete and returned to the Contractor and no payment shall be considered until such approval is obtained.

[Replace the 3rd Paragraph in its entirety with the following:].

The amount retained and deducted by the BOARD shall be 5% of the progress estimates for all progress payments. No reduction in the amount of retention will be allowed. However, after 50% of the work has been completed, if the BOARD finds that satisfactory progress is being made, it may make any of the remaining progress payments in full for actual work completed. The final payment of the retention amount to the Contractor shall be made thirty-five (35) days after the date of the recording of the Notice of the Completion of the work after it is accepted by the CITY. The 5% withheld from each progress payment shall not include monies withheld for stop notices or other withholding by the CITY. The monies withheld for stop notice and other withholdings shall be in addition to the 5% withheld for retention.

[Add to end of Section the following:].

Contractor shall comply with the requirements of Division 2, Part 1, Chapter 7, Section 7107 of the California Public Contract Code.

The lead time for processing invoices for the monthly progress payments approved by the ENGINEER for inclusion on the warrant list of the CITY is governed by the rules and regulations established by the Finance Department of the CITY. Monthly payments will be processed and paid in accordance with the rules and regulations established or revised by the said Finance Department.

The Contractor shall submit all weight tickets or volumes of all materials used in the construction to the ENGINEER for checking and verification prior to any payment. Failure to do so will postpone the payment to the Contractor, until the matter is resolved satisfactorily.

The weight or volume from submitted tickets must correspond to the work done in the field; if not, the City shall reject the work without compensation to the Contractor, and/or the Contractor shall be directed to replace that work at no additional costs to the City.

After completion of the Contract, the BOARD shall, upon recommendation of the ENGINEER, accept the Work as completed and authorize the Final Payment.

The Final Payment shall be the entire sum found to be due the Contractor after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

No certificate given or payment made under the Contract, except the final certificate or Final Payment, shall be conclusive evidence of full or substantial performance of this Contract; and no payment shall be construed to be an acceptance of any defective work or improper material.

The acceptance of Final Payment by the Contractor shall release the CITY, the BOARD, and the ENGINEER from any and all claims or liabilities on account of work performed by the Contractor under the Contract or any alterations thereof.

The Contractor shall record, on the set of contract documents maintained at the job site, deviations which have been made from the Contract Documents or approved shop drawings – including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Documents. Said record documents shall be supplemented by detailed sketches as necessary or directed, to indicate fully the work as actually constructed.

Requests for partial payments shall not be approved until the record documents are brought up to date. Also, request for final compensation shall not be approved until all the variations between the work as constructed and as originally shown in the Contract Documents have been properly recorded and delivered to the City, after approved by the Engineer.

[Add the following:].

7-3.2.1 Prompt Progress Payment to Subcontractors

Contractor shall comply with the requirements of Division 2, Part 1, Chapter 7, Section 7200 of the California Public Code.

The CONTRACTOR agrees to pay each subcontractor under this Agreement for satisfactory performance of its contract no later than 7 days from the receipt of each payment the CONTRACTOR receives from CITY.

The CONTRACTOR agrees further to release retainage payments to each subcontractor within 7 days after the retention payment is received by the CONTRACTOR.

Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the CITY. Any violation of this provision shall subject the violating prime contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. This clause applies to both DBE and non-DBE prime contractors and subcontractors.

City will be strictly monitoring the Contractor for prompt payment to all subcontractors.

[Add the following:].

7-3.2.2 Prompt Pay Monitoring and Enforcement of Progress Payments

The City of Costa Mesa will use the following monitoring and enforcement mechanisms to ensure that all subcontractors, including DBE's, are promptly paid.

A. The City will strictly monitor the prime contractor or subcontractor(s) for prompt release of progress payments for all subcontracted work as follows:

   1. The effective date of release is the date the City releases the check to the prime contractor by mailing or hand delivery at the City of Costa Mesa (has to be

requested in writing ahead of time).

2. Prime contractor or subcontractor(s) to provide verification in writing that the subcontracts have been paid within 7 days or the time period agreed, from the effective date of release.

3. City may contact subcontractor(s) to confirm receipt of progress payment amount and if it was received within 7 days or the time period agreed from the effective date of release.

B. If the prime contractor or subcontractor(s) is found to be in default of Federal or State Codes concerning prompt payment to subcontractors, City will enforce the following besides the disciplinary action, sanctions and penalties imposed per the codes:

1. City will withhold 150% of the monies due to the subcontractor(s) from the prime contractor's next progress payment.

2. City may also elect to make the payment(s) directly to the subcontractor(s) without the prime contractor's approval for the remainder of the contract.

7-3.3 Delivered Materials

[Replace in its entirety with the following:].

The cost of materials and equipment delivered, but not incorporated in said work, will not be included in the progress payment estimate unless otherwise provided in these Specifications. All materials shall be nontoxic and shall not contain asbestos and hazardous substances as established by applicable laws.

Materials delivered, but not in place, will not be classed as work done, except as otherwise provided in these Specifications.

7-3.4 Mobilization

[Replace in its entirety with the following:].

Mobilization shall consist of all preparatory work and operations. It shall include, but not be limited to, the movement of personnel, equipment, materials and incidentals to the project site necessary for work on the project. The mobilization shall include all other work and operations, which must be performed.

Mobilization shall also include the time, materials, and labor to move the necessary construction equipment to and from the job site and the project administration costs during the entire contract period.

This work shall include, but not be limited to protect-in-place and/or relocation of the facility to accommodate the construction of an improvement; including resetting curb drains through new curbing.
The Contractor shall provide supervisory personnel to keep the construction site in a safe condition and all other related work as required at all times. These requirements shall

also apply to all non-working days during construction period. The Contractor is responsible for securing an adequate storage site for equipment and materials.

The Contractor shall have on the work site at all times, as his agent, a competent English speaking superintendent capable of reading and thoroughly understanding the plans, specifications, and other related documents.

7-3.4.1 Travel Route for Trucking and Equipment

Plans indicating the travel route for the Contractor's equipment movement in and out of the work site must be submitted concurrently with the Haul Route Plan (Section 2-5.4) to the ENGINEER at the pre-construction meeting for approval prior to commencement of any work. The travel route plans, which meet the City's requirements, will be approved and returned to the Contractor; otherwise, further revisions are required until they are acceptable to the City. The approved travel plans shall be strictly adhered to by the Contractor during all phases of the construction.

Any deviation from these requirements is not permitted. All the Contractor's operations will be ceased at once if the Contractor violates any of these requirements. No further payments will be made to the Contractor until problems are resolved according the City's requirements.

7-3.4.2 Construction Sequence/Order of Work

In order to minimize the inconveniences to the residents and businesses, the contractor shall construct the Project and sequence the work where no two adjacent streets are closed at one time, and/or the nearest parking is no more than 300' from the intersection of the street being closed to traffic. The Contractor shall maintain adjacent streets open for ingress and egress and for parking.

7-4 PAYMENT FOR EXTRA WORK

7-4.2 Basis for Establishing Costs.

7-4.2.1 Labor

[Add the following:].

The compensation for employer's payments of payroll taxes; workers compensation insurance; liability insurance; health and welfare; pension; vacation; apprenticeship funds; other direct costs resulting from Federal, State, or local laws; and for assessments or benefits required by lawful collective bargaining agreements to be applied to the actual cost for wages shall be **23 percent** for regular time and overtime.

7-4.3 Markups

7-4.3.1 Work by the Contractor

[Replace in its entirety with the following:].

The allowance for overhead and profit to be added to the Contractor's costs shall be as follows:

Labor:	20%
Materials:	15%
Contractor Owned Equipment	15%
Equipment Rental	10%*
Other Items and Expenditures	10%

To the sum of the costs and markups provided for in this section, 1 percent shall be added as compensation for bonding.

* Equipment Rental rates shall be based on the latest applicable Caltrans Equipment Rental Rates.

7-4.3.2 Work by a Subcontractor

[Replace in its entirety with the following:].

When all or any part of the extra work is performed by a Subcontractor, the markup established in 7-4.3.1 shall be applied to the Subcontractor's actual cost of such work. A markup of five (5) percent on the first $5,000 of the subcontracted portion of the extra work and a markup of five (5) percent on work added in excess of $5,000 of the subcontracted portion of the extra work may be added by the Contractor.

No markups will be allowed for second tier or higher subcontractors.

[Add the following:].

7-6 SUMMARY OF PUBLIC CONTRACT CODE § 9204

The following procedure will apply to any claims by the Contractor on the City:

A "claim" is a separate demand on the City by a contractor on a public works project and sent by registered mail or certified mail with return receipt requested, for one or more of the following:

- A time extension, including relief from penalties for delay
- Payment by the City of money damages under the terms of the contract
- Payment of an amount that is disputed by the City

<u>Initial Review</u>

The claim must be supported by appropriate documentation. The City has 45 days within which to review the claim and provide the contractor with a written statement identifying the disputed and undisputed portions of the claim. If the City does not issue a written

statement, the claim is deemed rejected in its entirety. The City will pay any undisputed portion of the claim within 60 days of issuing the statement.

Meet & Confer

If the contractor disputes the City's written response, or if the City does not issue one, the contractor may request in writing an informal conference to meet and confer for possible settlement of the claim. The City will schedule the meet and confer conference within 30 days of this request and provide a written statement identifying the remaining disputed and undisputed portions of the claim within 10 business days of the meet and confer. The City will pay the undisputed portion within 60 days of issuing this statement.

Mediation

With respect to any disputed portion remaining after the meet and confer, the City and contractor will submit the matter to nonbinding mediation, agree to a mediator within 10 business days after issuing the written statement, and share mediation costs equally. If mediation is unsuccessful, then the terms of the public works agreement and applicable law will govern resolution of the dispute.

Miscellaneous Provisions

Amounts not paid by the City in a timely manner bear interest at 7% per annum. Subcontractors may submit claims via this procedure through the general contractor. The City and contractor may waive the requirement to mediate, but cannot otherwise waive these claim procedures.

TECHNICAL PROVISIONS

FOR

BARK PARK,
JACK R. HAMMETT SPORTS COMPLEX,
COSTA MESA TENNIS CENTER,
AND THE
TeWINKLE PARK ATHLETIC COMPLEX

LIGHTING SPECIFICATION
PREPARED FOR

Tewinkle Park Bark Park

LED Lighting Project
Costa Mesa, CA
September 14, 2023

Project # 215827

SUBMITTED BY:

Musco Sports Lighting, LLC

2107 Stewart Road
PO Box 260
Muscatine, Iowa 52761
Local Phone: 563/263-2281
Toll Free: 800/756-1205
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SECTION 26 56 68 – EXTERIOR ATHLETIC LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

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 these specifications is to define the lighting system performance and design standards for Tewinkle Park Bark Park 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 venues:

1. Dog Park

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 to not drop below specified target values for a period of 10 years.
2. Cost of Ownership: 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 for the duration of the warranty.
3. 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. Fields should be proactively monitored to detect luminaire outages over a 10-year life cycle. All communication and monitoring costs for 10-year period shall be included in the bid.

1.2 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Grid Points	Grid Spacing
Dog Park	3.3fc	1076	10’ x 10’

B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 70.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
13	P1-P13	27’

1.3 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

C. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

1.4 Cost of Ownership

A. Manufacturer shall submit a 10 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly.
2. Non-approved pole technology:
    a. Square static cast concrete poles will not be accepted.
    b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
3. Lighting systems shall use concrete foundations. See Section 2.4 for details.
    a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.

4. Manufacturer will supply all drivers and supporting electrical equipment
    a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
    b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
8. Contactor cabinet to provide on-off control.
9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
    a. Integrated grounding via concrete encased electrode grounding system.
    b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
10. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following enhanced requirements in addition to the standard durability protection specified above:
    a) Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.
    b) Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.
    c) Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:
    1. Electric power: 480 Volt, 3 Phase
    2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The kW consumption for the field lighting system shall be 3.85 kW.

2.3 CONTROL

A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

C. 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. Scheduling tool shall be capable of setting curfew limits.

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.

D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

E. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

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. Report hours saved by using early off and push buttons by users.

F. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.

G. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.4 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2019 California Building Code. Wind loads to be calculated using ASCE 7-16, a design wind speed of 95mi/h, 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. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2016 CBC Table 1806.2.

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. Contractor may issue a change order request / estimate for the Owner’s approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of CA for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of

approved submittals and receipt of complete order information.

3.3 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. Field Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as “guaranteed” on the illumination summary provided by the manufacturer.
2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. Musco warrants your lighting system to be free from defects in materials and workmanship as outlined in Musco’s 10-Year Warranty. Musco agrees to provide labor and materials to replace defective parts or repair defects in workmanship. This includes all Musco manufactured product (wire harnesses, drivers, luminaires, poles, concrete bases, etc.).

B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 10 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.0 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.0.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.

B. Approved Product: Musco’s Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.

D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner’s representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. ***Submit checklist below with submittal.***

Yes/ No	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 b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, 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 foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed 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.
	F	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 to not fall below target levels for warranty period.
	G	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 CA, if required by owner.
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of CA.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product 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 CA.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of CA.
	K	Project References	Manufacturer to provide a list of five (5) projects where the technology and specific fixture proposed for this project has been installed in the state of CA. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.

	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
	N	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 Tewinkle Park Bark Park. 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:** _____/_____/_____

Contractor: _____ **Signature:** _____

Tewinkle Bark Park
Costa Mesa, CA
Retrofit Scope of Work

Customer Responsibilities:

1. Complete access to the site for construction using standard 2-wheel drive rubber tire equipment.
2. Locate existing underground utilities not covered by your local utilities. (i.e. water lines, electrical lines, irrigation systems, and sprinkler heads). Musco or Subcontractor will not be responsible for repairs to unmarked utilities.
3. Locate and mark field reference points per Musco supplied layout. (i.e. home plate, center of FB field).
4. If existing underground wiring is being used ensure usability.
5. Pay any necessary power company fees and requirements.
6. Pay all permitting fees.
7. Provide any existing as-built documents or drawings.
8. Provide sealed Electrical Plans. (If required)

Musco Responsibilities:

1. Provide required fixtures, electrical enclosures, mounts, hardware, wire harnesses, and control cabinets.
2. Provide poletop luminaire assembly on all poles.
3. Provide fixture layout and aiming diagram.

Contractor Responsibilities

General:

1. Obtain any required permitting.
2. Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner and Musco regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect Musco delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
9. Provide startup and aiming as required to provide complete and operating sports lighting system.
10. Installation to commence upon delivery and proceed without interruption until complete. Musco to be immediately notified of any breaks in schedule or delays.

Retrofit Musco Equipment to Existing Poles:

1. Provide labor, materials, and equipment to assemble and install Musco CREE OSQ fixtures on existing non Musco poles and terminate grounding and power feed. Power feed may need to be reworked to adapt to the new Musco equipment.
2. Ensure grounding components meet minimum standards required by NEC and NFPA780.
3. For concrete poles provide new lightning down conductor(aluminum) and $^{5}/_{8}$ in copper ground rod. For poles 75 ft (22 m) or less use 1/0 AWG, poles over 75 ft (22 m) use 4/0 AWG conductor. Bond internal pole ground to new down conductor.
4. For steel poles provide new ground rod and pole bonding conductor per NFPA Annex A.1.6.
5. Down conductor shall be converted to copper wire for any underground runs and bonded to ground rod(s).
6. Ensure all Musco components are bonded to both equipment and lightning grounds. No upward sweeps allowed for lightning down conductor or bonding jumper(s). See installation instructions for further information.
7. Test ground resistance with 3-point megger and confirm 25 ohms or less for each pole. Install additional ground rods or create grounding grid until resistance of 25 ohms or less is achieved.

CODE OF CONDUCT

In order to maintain a high-quality jobsite and installation, Subcontractor represents to Musco that it has the supervision necessary to, and shall train, manage, supervise, monitor, and inspect the activities of its employees for the purpose of enforcing compliance with these safety requirements. Subcontractor acknowledges that Musco does not undertake any duty toward Subcontractor's employees to train, manage, supervise, monitor, and inspect their work activities for the purpose of enforcing compliance with these safety requirements, but Subcontractor agrees to abide by any reasonable recommendations made by Musco or Musco representatives with respect to safety.

Subcontractor agrees that it is or will be familiar with and shall abide by the safety rules and regulations of Musco and the Owner, including, but not limited to the Occupational Safety and Health Act of 1970 (OSHA), all rules and regulations established pursuant thereto, and all amendments and supplements thereto.

Subcontractor further agrees to require all its employees, subcontractors, and suppliers to comply with these requirements. Subcontractor shall also observe and comply with all laws with respect to environmental protection applicable to the Project.

Subcontractor shall require all its subcontractors, employees, visitors, suppliers, and agents under its direction to comply with the following:

1. GENERAL JOBSITE SAFETY AND CLEANLINESS.
   a. Subcontractor's employees and agents shall be required to wear appropriate personal protective equipment including, but not limited to, safety glasses with side shields, work shoes, fall protection devices, and hard hats.
   b. Where a walking or working surface has an unprotected side or edge which is six feet or more above a lower level, Subcontractor shall use guardrail systems, safety net systems, or personal fall arrest systems.
   c. Jobsite shall be kept free of debris including, but not limited to, cardboard and packing materials which can become windborne.
   d. Construction equipment shall be parked during non-use in an orderly fashion so as not to create inconvenience to others using the jobsite.
   e. Subcontractor shall provide for and ensure the use of safety equipment for the Project in accordance with Musco's and Owner's safety requirements, to the extent these may be stricter than federal, state, or local standards, or generally recognized industry applicable standards.
   f. Subcontractor shall provide the Musco project manager with an "Emergency List" showing Subcontractor's designated medical doctor, hospital, insurance company, and any other health service providers, such list to be updated within 24 hours of any change in the information provided.
   g. Within eight (8) hours from the time of an accident (or such shorter period as laws may require), Subcontractor shall advise Musco of any accident resulting in injury to any person or damage to any equipment or facility. Upon request, Subcontractor shall promptly furnish Musco with a written report of any such accident as well as a copy of all insurance and worker's compensation claims involving the Project.
   h. Subcontractor shall maintain and inspect all construction equipment, including cranes and other lifting equipment, prior to each use. Subcontractor warrants that all equipment operators shall be qualified for each piece of construction equipment they intend to operate. Documentation of specific training is the responsibility of the Subcontractor.
   i. Jobsite shall be policed daily for compliance to the above conditions.

j. Subcontractor's employees and agents are prohibited from using drugs and alcohol on the Project property or being under the influence of alcohol or drugs while performing work on the Project. Anyone observed participating in or observed under the influence will be removed from the Project immediately and prohibited from returning, with no exceptions.

2. CONFORMANCE TO STANDARD MUSCO INSTALLATION GUIDELINES.
   a. Review and understand installation instructions are provided with every product installation.
   b. Education of installation personnel to allow for highest efficiency and lowest possibility of failure.
   c. Verify that components have been assembled per Musco installation instructions.
   d. Verify plumb of concrete foundations prior to standing of poles.

3. PROVIDING A QUALITY INSTALLATION TEAM.
   a. Subcontractor's work directly reflects the quality of the installation and may indirectly relate to the quality of the product upon which Musco's reputation is built.
   b. Provide and maintain quality installation equipment. Records of maintenance and/or calibration shall be provided upon request.
   c. Personnel shall be knowledgeable in operation of equipment as well as installation of Musco product.
   d. All personnel provided by Subcontractor shall understand the relationship developed by and between Subcontractor and Musco, also by and between Musco and the customer, and act accordingly.

Tewinkle Bark Park
Costa Mesa, CA
Retrofit Scope of Work

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3. Locate and mark field reference points per Musco supplied layout. (i.e. home plate, center of FB field).
4. If existing underground wiring is being used ensure usability.
5. Pay any necessary power company fees and requirements.
6. Pay all permitting fees.
7. Provide any existing as-built documents or drawings.
8. Provide sealed Electrical Plans. (If required)

Musco Responsibilities:

1. Provide required fixtures, electrical enclosures, mounts, hardware, wire harnesses, and control cabinets.
2. Provide poletop luminaire assembly on all poles.
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2. Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner and Musco regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect Musco delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
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1. Provide labor, materials, and equipment to assemble and install Musco CREE OSQ fixtures on existing non Musco poles and terminate grounding and power feed. Power feed may need to be reworked to adapt to the new Musco equipment.
2. Ensure grounding components meet minimum standards required by NEC and NFPA780.
3. For concrete poles provide new lightning down conductor(aluminum) and $^{5}/_{8}$ in copper ground rod. For poles 75 ft (22 m) or less use 1/0 AWG, poles over 75 ft (22 m) use 4/0 AWG conductor. Bond internal pole ground to new down conductor.
4. For steel poles provide new ground rod and pole bonding conductor per NFPA Annex A.1.6.
5. Down conductor shall be converted to copper wire for any underground runs and bonded to ground rod(s).
6. Ensure all Musco components are bonded to both equipment and lightning grounds. No upward sweeps allowed for lightning down conductor or bonding jumper(s). See installation instructions for further information.
7. Test ground resistance with 3-point megger and confirm 25 ohms or less for each pole. Install additional ground rods or create grounding grid until resistance of 25 ohms or less is achieved.

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Subcontractor agrees that it is or will be familiar with and shall abide by the safety rules and regulations of Musco and the Owner, including, but not limited to the Occupational Safety and Health Act of 1970 (OSHA), all rules and regulations established pursuant thereto, and all amendments and supplements thereto.

Subcontractor further agrees to require all its employees, subcontractors, and suppliers to comply with these requirements. Subcontractor shall also observe and comply with all laws with respect to environmental protection applicable to the Project.

Subcontractor shall require all its subcontractors, employees, visitors, suppliers, and agents under its direction to comply with the following:

1. GENERAL JOBSITE SAFETY AND CLEANLINESS.
   a. Subcontractor's employees and agents shall be required to wear appropriate personal protective equipment including, but not limited to, safety glasses with side shields, work shoes, fall protection devices, and hard hats.
   b. Where a walking or working surface has an unprotected side or edge which is six feet or more above a lower level, Subcontractor shall use guardrail systems, safety net systems, or personal fall arrest systems.
   c. Jobsite shall be kept free of debris including, but not limited to, cardboard and packing materials which can become windborne.
   d. Construction equipment shall be parked during non-use in an orderly fashion so as not to create inconvenience to others using the jobsite.
   e. Subcontractor shall provide for and ensure the use of safety equipment for the Project in accordance with Musco's and Owner's safety requirements, to the extent these may be stricter than federal, state, or local standards, or generally recognized industry applicable standards.
   f. Subcontractor shall provide the Musco project manager with an "Emergency List" showing Subcontractor's designated medical doctor, hospital, insurance company, and any other health service providers, such list to be updated within 24 hours of any change in the information provided.
   g. Within eight (8) hours from the time of an accident (or such shorter period as laws may require), Subcontractor shall advise Musco of any accident resulting in injury to any person or damage to any equipment or facility. Upon request, Subcontractor shall promptly furnish Musco with a written report of any such accident as well as a copy of all insurance and worker's compensation claims involving the Project.
   h. Subcontractor shall maintain and inspect all construction equipment, including cranes and other lifting equipment, prior to each use. Subcontractor warrants that all equipment operators shall be qualified for each piece of construction equipment they intend to operate. Documentation of specific training is the responsibility of the Subcontractor.
   i. Jobsite shall be policed daily for compliance to the above conditions.

j. Subcontractor's employees and agents are prohibited from using drugs and alcohol on the Project property or being under the influence of alcohol or drugs while performing work on the Project. Anyone observed participating in or observed under the influence will be removed from the Project immediately and prohibited from returning, with no exceptions.

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   a. Subcontractor's work directly reflects the quality of the installation and may indirectly relate to the quality of the product upon which Musco's reputation is built.
   b. Provide and maintain quality installation equipment. Records of maintenance and/or calibration shall be provided upon request.
   c. Personnel shall be knowledgeable in operation of equipment as well as installation of Musco product.
   d. All personnel provided by Subcontractor shall understand the relationship developed by and between Subcontractor and Musco, also by and between Musco and the customer, and act accordingly.

ATTACHMENT 2

Control System Summary

Project Specific Notes:

Project Information

Project #:	215827
Project Name:	Tewinkle Park Bark Park
Date:	02/28/22
Project Engineer:	Vashon Alexander
Sales Representative:	Karin Anderson
Control System Type:	Lighting Contactor Cabinet
Communication Type:	None
Scan:	215827A
Document ID:	215827P1V1-0228160557
Distribution Panel Location or ID:	Bark Park
Total # of Distribution Panel Locations for Project:	1
Design Voltage/Hertz/Phase:	480/60/3
Control Voltage:	120

Equipment Listing

DESCRIPTION	APPROXIMATE SIZE
1.Lighting Contactor Cabinet	24 X 48

	QTY	SIZE (AMPS)
Total Contactors	5	30 AMP
Total Off/On/Auto Switches:	1	

Preliminary Plans
Confirm all Details - voltage,
# of distribution panels, etc.

Materials Checklist

Contractor/Customer Supplied:

- ❑ A dedicated control circuit must be supplied per distribution panel location.
  - — If the control voltage is NOT available, a control transformer is required.
- ❑ Electrical distribution panel to provide overcurrent protection for circuits
  - — HID rated or D-curve circuit breaker sized per full load amps on Circuit Summary by Zone Chart
- ❑ Wiring:
  - — See chart on page 2 for wiring requirements
  - — Equipment grounding conductor and splices must be insulated. (per circuit)
  - — Lightning ground protection (per pole), if not Musco supplied.
- ❑ Electrical conduit wireway system
  - — Entrance hubs rated NEMA 4: must be die-cast zinc, PVC, or copper-free die-cast aluminum
- ❑ Mounting hardware for cabinets
- ❑ Breaker lock-on device to prevent unauthorized power interruption to control power
- ❑ Anti-corrosion compound to apply to ends of wire, if necessary

IMPORTANT NOTES

1. Please confirm that the design voltage listed above is accurate for this facility. Design voltage/phase is defined as the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate design voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole. When a 3 phase design is used Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each pole. When a pole has multiple circuits, one contactor is required for each circuit. All contactors are 100% rated for the published continuous load. All contactors are 3 pole.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. A single control circuit must be supplied per control system.
6. Size overcurrent devices using the full load amps column of the Circuit Summary By Zone chart- Minimum power factor is 0.9.

NOTE: Refer to Installation Instructions for more details on equipment information and the installation requirements.

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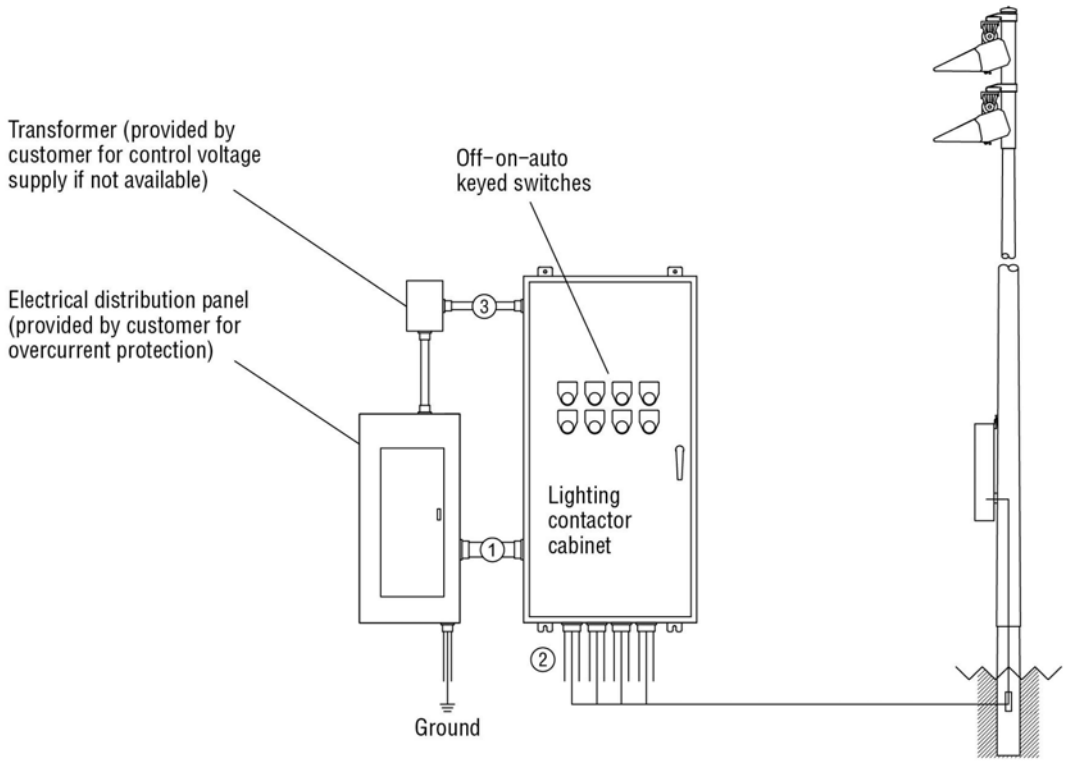
ATTACHMENT 2

Control System Summary

Lighting Contactor Cabinet



Wire	Description	# of Wires	Typ. Wire Size (AWG)	Max. Wire Length (FT)	Wire from Musco	Notes
1	Line power to contactors, and equipment grounding conductor	Note A	Note B	27	No	A – E
2	Load power to lighting circuits, and equipment grounding conductor	Note A	Note B	N/A	No	A – D
3	Control power (dedicated, 20A)	3	12	N/A	No	C, D

R60-28-00_D

Notes:
A. See voltage and phasing per the notes on cover page.
B. Calculate per load and voltage drop.
C. All conduit diameters should be per code.
D. Refer to lighting contactor cabinets installation instructions for more details on equipment information and the installation requirements.
E. Contact Musco if maximum wire length from circuit breaker to contactor exceeds value in chart.

IMPORTANT: Control wire (3) must be in separate conduit from line and load power wires (1, 2).

ATTACHMENT 2

Control System Summary

Tewinkle Park Bark Park / 215827 - 215827A
Bark Park - Page 3 of 4

SWITCHING SCHEDULE

Field/Zone Description	Zones
Dog Park	**1**

CONTROL POWER CONSUMPTION	
120V Single Phase	
VA loading of Musco Supplied Equipment	INRUSH: 1225.0
	SEALED: 130.0

CIRCUIT SUMMARY BY ZONE

POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR ID	ZONE
P1,P2,P3,P4	Dog Park	12	12	**1.5**	30	C1	1
P5,P6,P7,P8	Dog Park	12	12	**1.5**	30	C2	1
P10,P11,P9	Dog Park	9	3	**1.1**	30	C3	1
P12	Dog Park	2	2	**0.4**	30	C5	1
P13	Dog Park	2	2	**0.4**	30	C6	1

*Full Load Amps based on amps per driver.

ATTACHMENT 2

Control System Summary

Tewinkle Park Bark Park / 215827 - 215827A
Bark Park - Page 4 of 4

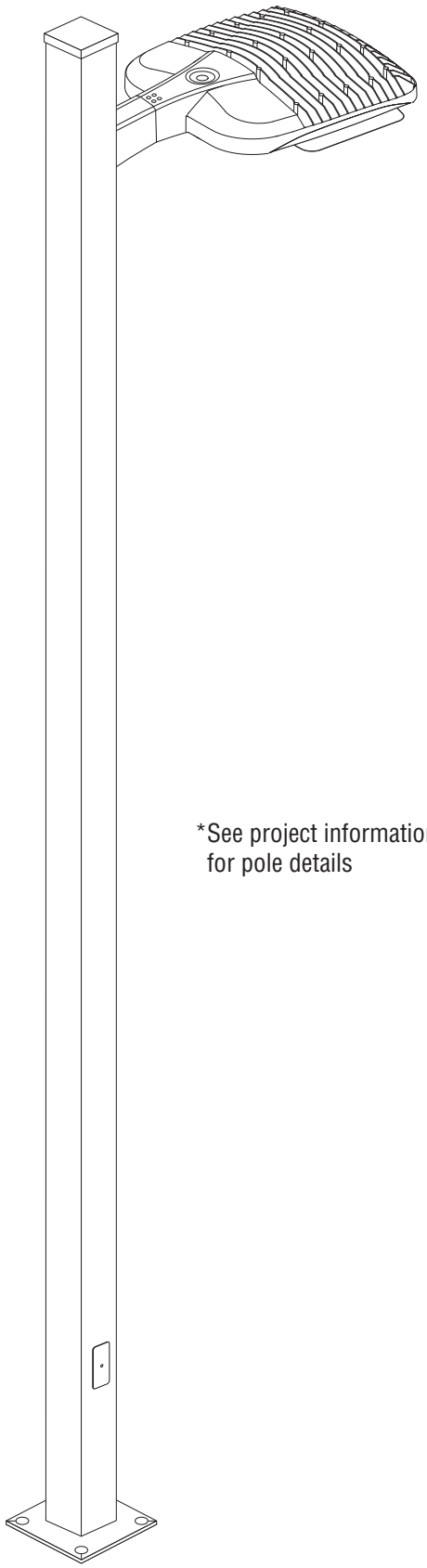
PANEL SUMMARY

CABINET #	CONTROL MODULE LOCATION	CONTACTOR ID	CIRCUIT DESCRIPTION	FULL LOAD AMPS	DISTRIBUTION PANEL ID (BY OTHERS)	CIRCUIT BREAKER POSITION (BY OTHERS)
1	---	C1	Pole P1,P2,P3,P4	1.52		
1	---	C2	Pole P5,P6,P7,P8	1.52		
1	---	C3	Pole P10,P11,P9	1.14		
1	---	C5	Pole P12	0.38		
1	---	C6	Pole P13	0.38		

ZONE SCHEDULE

			CIRCUIT DESCRIPTION	
ZONE	SELECTOR SWITCH	ZONE DESCRIPTION	POLE ID	CONTACTOR ID
Zone 1	1	Dog Park	P1	C1
			P2	C1
			P3	C1
			P4	C1
			P5	C2
			P6	C2
			P7	C2
			P8	C2
			P10	C3
			P11	C3
			P9	C3
			P12	C5
			P13	C6

Datasheet: **OSQ™ Area Luminaire on Valmont® Soft Square Pole**



*See project information for pole details

Luminaire Data

Manufacturer ..... Cree Lighting

Material and finish ..... Die-cast aluminum with powder-coat finish[1]

Mounting ..... Direct pole mount

Weight (luminaire) ..... 28.9 lb (13.1 kg)

Regulatory and Voluntary Qualifications

UL ..... cULus Listed

Environment ..... Suitable for wet locations

Ingress Protection IP66

Emissions ..... Meets FCC Part 15, Subpart B, Class A limits for conducted and radiated emissions

RoHS ..... Compliant

Photometric Characteristics

Lumen maintenance factor[2]

- 25k hours[3] 0.99
- 50k hours[3] 0.97
- 75k hours[3] 0.95
- 100k hours[3] 0.93

CIE correlated color temperature ..... 5700 K

Color Rendering Index (CRI), minimum 70

Lumens 16,000

Footnotes:

1) Cree Lighting's exclusive Colorfast DeltaGuard® finish freatures an E-coat epoxy primer with an ultra-durable powder topcoat, providing excellent resistance to corrosion, ultraviolet degradation, and abrasion. Color options include black, white, silver, and bronze.

2) Lumen maintenance values at 25˚C ambient temperature are calculated per TM-21 based on LM-80 data and in-situ luminaire testing.

3) Values are represented as projected values within six times limit of tested hours per IES TM-21-11.

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Colorfast DeltaGuard® is a registered trademark, and OSQ™ is a trademark of Cree Lighting, A company of IDEAL INDUSTRIES.
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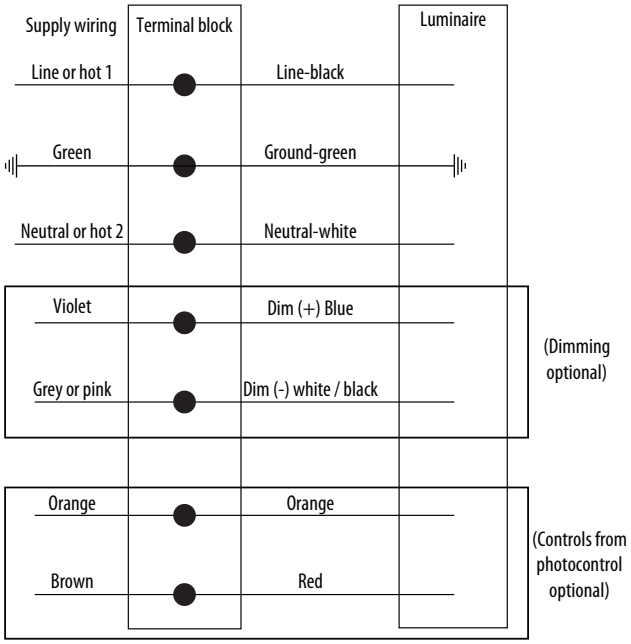
Datasheet: **OSQ™ Area Luminaire on Valmont® Soft Square Pole**

Electrical Data

Rated wattage per luminaire[1] ..... 104 W
Input voltage ..... 120 – 277 V or 347 – 480 V, 50/60 Hz
Driver configuration ..... Integral, Class 1
Driver Efficiency ..... >90%
Starting (inrush) current ..... See note 1
Power factor at full load ..... >0.9
Total Harmonic Distortion at full load ..... <20%
Operating temperature range .-40˚C to +40˚C (-40˚F to +104˚F)
Dimming mode[2] ..... 0 – 10 V dimming to 10%

Typical Wiring



	120 Vac	208 Vac	240 Vac	277 Vac	347 Vac	480 Vac
Max operating current[3]	0.89 A	0.51 A	0.43 A	0.39 A	0.31 A	0.22 A

Footnotes:

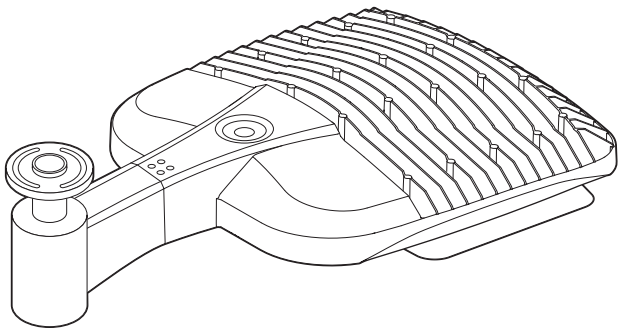
1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25˚C ambient temperature environment.

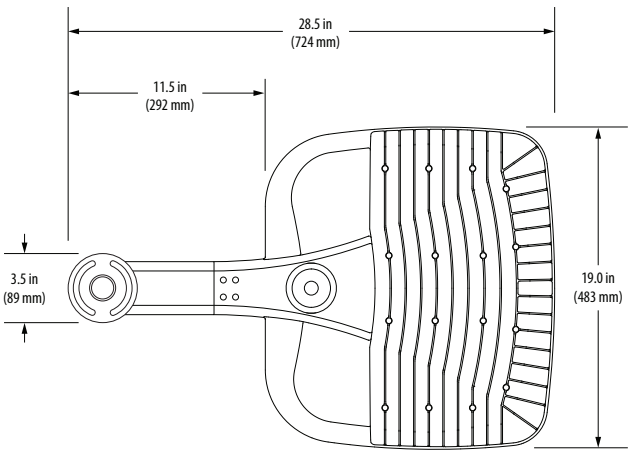
2) Dimming controls not provided by Musco. Driver provides 10 V source current at 1.0 mA, compliant with IEC 60929 Annex E dimming standard.

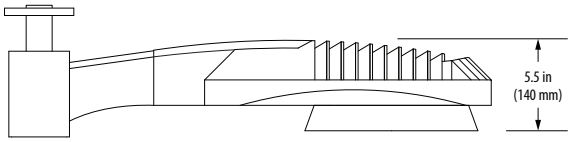
3) Operating current based on 25°C ambient temperature at full load. Contact Musco engineering for amperes if operating in different conditions.

Notes

1. When code dictates fusing, a slow blow fuse or type C/D breaker should be used to address inrush current.







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ATTACHMENT 2

Tewinkle Park Bark Park

Costa Mesa,CA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
P1-P11	27'	27'	3	CREE OSQ	0.31 kW	A
P12-P13	27'	27'	2	CREE OSQ	0.21 kW	A
13			***37***		***3.85 kW***	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Dog Park	3.85 kW	37

Fixture Type Summary

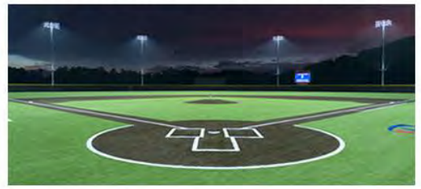
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
CREE OSQ	LED 5700K - 70 CRI	104W	15,147	--	--	--	37

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Dog Park	Horizontal Illuminance	3.39	1	8	11.43	3.39	A	37

From Hometown to Professional



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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
11	P1-P11	27'	3'	30'	CREE OSQ	3	3	0
2	P12-P13	27'	3'	30'	CREE OSQ	1/1*	2	0
13	TOTALS					37	37	0

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Tewinkle Park Bark Park

Costa Mesa,CA

GRID SUMMARY

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

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Scan Average:	**3.39**
Maximum:	8
Minimum:	1
Avg / Min:	5.16
Max / Min:	**11.43**
UG (adjacent pts):	1.59
CU:	0.64
No. of Points:	1076

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**37**
Total Load:	3.85 kW

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 RP-6-15.

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

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

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Tewinkle Park Bark Park

Costa Mesa,CA

EQUIPMENT LAYOUT

INCLUDES:
· Dog Park

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

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

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
11	P1-P11	27'	3'	30'	CREE OSQ	3
2	P12-P13	27'	3'	30'	CREE OSQ	1/1*
13	TOTALS					37

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

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
Cree OSQ	-	-	-	-	0.3	-	0.2

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

ENGINEERED DESIGN By: Vashon Alexander · File #215827A · 28-Feb-22

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LIGHTING SPECIFICATION
PREPARED FOR

Jack Hammett Sports Complex LED Retrofit

LED Lighting Project
Costa Mesa, CA
September 14, 2023

Project # 224349

SUBMITTED BY:

Musco Sports Lighting, LLC

2107 Stewart Road
PO Box 260
Muscatine, Iowa 52761
Local Phone: 563/263-2281
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SECTION 26 56 68 – EXTERIOR ATHLETIC LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

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 these specifications is to define the lighting system performance and design standards for Jack Hammett Sports Complex LED Retrofit 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 venues:

1. Soccer 1
2. Soccer 2
3. Soccer 3
4. Soccer 4

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 to not drop below specified target values for a period of 25 years.
2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.
3. Cost of Ownership: 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 for the duration of the warranty.
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. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

1.2 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Soccer 1	30 fc	2.5:1	96	30’ x 30’
Soccer 2	30 fc	2.5:1	96	30 x 30’
Soccer 3	30 fc	2.5:1	60	30’ x 30’
Soccer 4	30 fc	2.5:1	60	30’ x 30’

B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
15	A1- A4, B1, B2, C1, C2, S1- S6	80’

1.3 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

	Average	Maximum
Spill at Fence Specified Spill Line Horizontal Footcandles	0.05 fc	0.25 fc
Spill at Fence Specified Spill Line Max Vertical Footcandles	0.05 fc	0.02 fc

C. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.

D. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer’s laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

1.4 Cost of Ownership

A. Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be

stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly.
2. Non-approved pole technology:
    a. Square static cast concrete poles will not be accepted.
    b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
3. Lighting systems shall use concrete foundations. See Section 2.4 for details.
    a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
4. Manufacturer will supply all drivers and supporting electrical equipment
    a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
    b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
8. Contactor cabinet to provide on-off control.
9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
    a. Integrated grounding via concrete encased electrode grounding system.
    b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
10. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following

enhanced requirements in addition to the standard durability protection specified above:

a) Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.

b) Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

c) Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:
1. Electric power: 480V Volt, 3 Phase
2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The kW consumption for the field lighting system shall be 90.60 kW.

2.3 CONTROL

A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

C. 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. Scheduling tool shall be capable of setting curfew limits.

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.

D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

E. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

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. Report hours saved by using early off and push buttons by users.

F. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.

G. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.4 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2019 California Building Code. Wind loads to be calculated using ASCE 7-16, a design wind speed of 95mi/h, 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. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2016 CBC Table 1806.2.

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. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of CA for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of approved submittals and receipt of complete order information.

3.3 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. Field Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer

shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.

B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.0 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.0.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.

B. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.

D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. ***Submit checklist below with submittal.***

Yes/ No	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 b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, 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 foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed 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.
	F	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 to not fall below target levels for warranty period.
	G	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 CA, if required by owner.
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of CA.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product 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 CA.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of CA.
	K	Project References	Manufacturer to provide a list of five (5) projects where the technology and specific fixture proposed for this project has been installed in the state of CA. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.
	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.

	N	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 Jack Hammett Sports Complex LED Retrofit. 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:** _____/_____/_____

Contractor: _____ **Signature:** _____

Jack Hammett Sports Complex LED Retrofit
Costa Mesa, CA
Retrofit Scope of Work

Customer Responsibilities:

1. Complete access to the site for construction using standard 2-wheel drive rubber tire equipment.
2. Locate existing underground utilities not covered by your local utilities. (i.e. water lines, electrical lines, irrigation systems, and sprinkler heads). Musco or Subcontractor will not be responsible for repairs to unmarked utilities.
3. Locate and mark field reference points per Musco supplied layout. (i.e. home plate, center of FB field).
4. If existing underground wiring is being used ensure usability.
5. Pay any necessary power company fees and requirements.
6. Pay all permitting fees.
7. Provide any existing as-built documents or drawings.
8. Provide sealed Electrical Plans. (If required)

Musco Responsibilities:

1. Provide required fixtures, electrical enclosures, mounts, hardware, wire harnesses, and control cabinets.
2. Provide poletop luminaire assembly on all poles
3. Provide fixture layout and aiming diagram.

Contractor Responsibilities

General:

1. Obtain any required permitting.
2. Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner and Musco regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect Musco delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
9. Provide startup and aiming as required to provide complete and operating sports lighting system.
10. Installation to commence upon delivery and proceed without interruption until complete. Musco to be immediately notified of any breaks in schedule or delays.

Retrofit Musco Equipment to Existing Poles:

1. Provide labor, materials, and equipment to assemble and install Musco TLC for LED® equipment on existing poles and terminate grounding and power feed. Power feed may need to be reworked to adapt to the new Musco equipment.
2. Ensure grounding components meet minimum standards required by NEC and NFPA780.
3. For concrete poles provide new lightning down conductor(aluminum) and $^{5}/_{8}$ in copper ground rod. For poles 75 ft (22 m) or less use 1/0 AWG, poles over 75 ft (22 m) use 4/0 AWG conductor. Bond internal pole ground to new down conductor.
4. For steel poles provide new ground rod and pole bonding conductor per NFPA Annex A.1.6.
5. Down conductor shall be converted to copper wire for any underground runs and bonded to ground rod(s).
6. Ensure all Musco components are bonded to both equipment and lightning grounds. No upward sweeps allowed for lightning down conductor or bonding jumper(s). See installation instructions for further information.
7. Test ground resistance with 3-point megger and confirm 25 ohms or less for each pole. Install additional ground rods or create grounding grid until resistance of 25 ohms or less is achieved.

CODE OF CONDUCT

In order to maintain a high-quality jobsite and installation, Subcontractor represents to Musco that it has the supervision necessary to, and shall train, manage, supervise, monitor, and inspect the activities of its employees for the purpose of enforcing compliance with these safety requirements. Subcontractor acknowledges that Musco does not undertake any duty toward Subcontractor's employees to train, manage, supervise, monitor, and inspect their work activities for the purpose of enforcing compliance with these safety requirements, but Subcontractor agrees to abide by any reasonable recommendations made by Musco or Musco representatives with respect to safety.

Subcontractor agrees that it is or will be familiar with and shall abide by the safety rules and regulations of Musco and the Owner, including, but not limited to the Occupational Safety and Health Act of 1970 (OSHA), all rules and regulations established pursuant thereto, and all amendments and supplements thereto.

Subcontractor further agrees to require all its employees, subcontractors, and suppliers to comply with these requirements. Subcontractor shall also observe and comply with all laws with respect to environmental protection applicable to the Project.

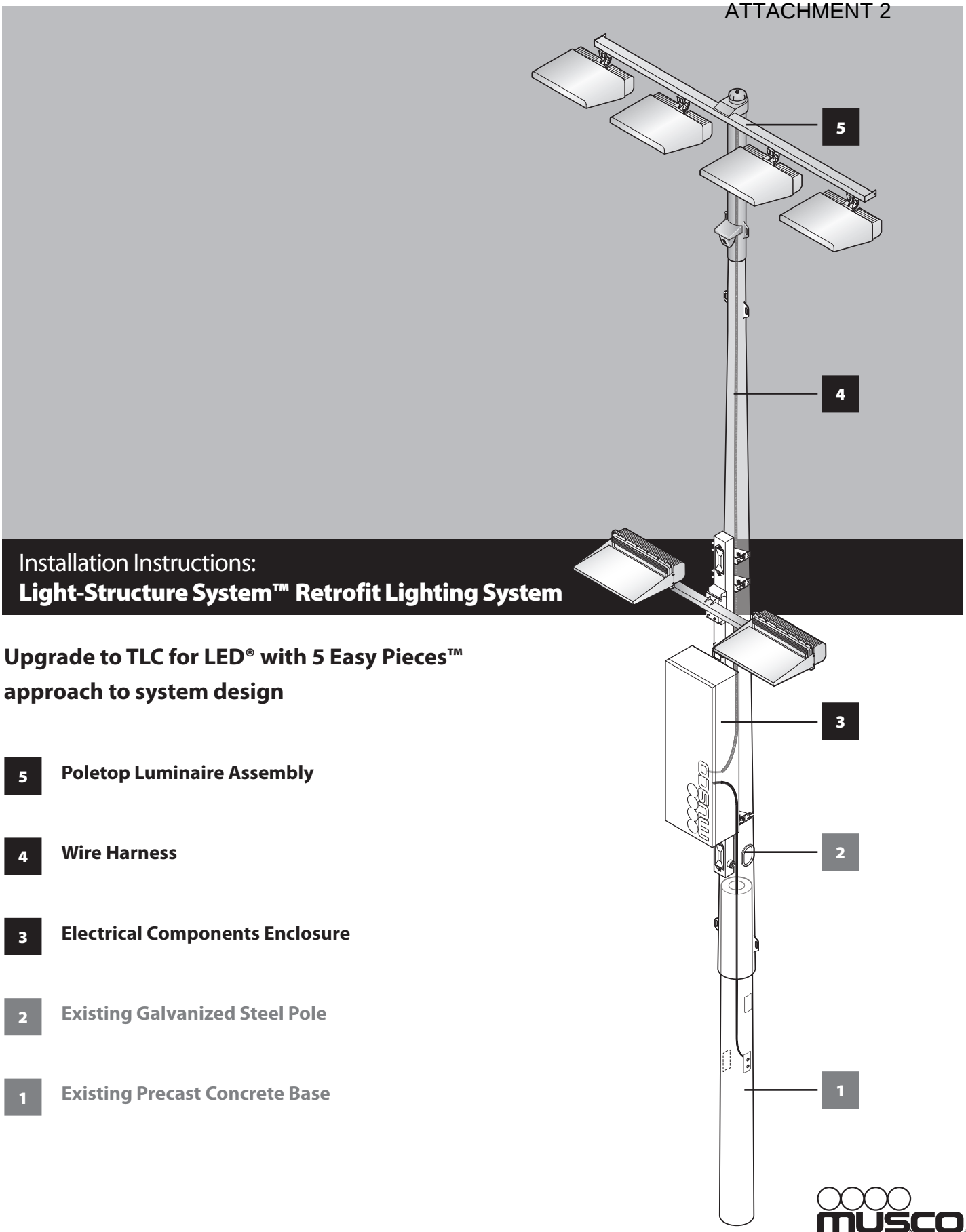
Subcontractor shall require all its subcontractors, employees, visitors, suppliers, and agents under its direction to comply with the following:

1. GENERAL JOBSITE SAFETY AND CLEANLINESS.
   a. Subcontractor's employees and agents shall be required to wear appropriate personal protective equipment including, but not limited to, safety glasses with side shields, work shoes, fall protection devices, and hard hats.
   b. Where a walking or working surface has an unprotected side or edge which is six feet or more above a lower level, Subcontractor shall use guardrail systems, safety net systems, or personal fall arrest systems.
   c. Jobsite shall be kept free of debris including, but not limited to, cardboard and packing materials which can become windborne.
   d. Construction equipment shall be parked during non-use in an orderly fashion so as not to create inconvenience to others using the jobsite.
   e. Subcontractor shall provide for and ensure the use of safety equipment for the Project in accordance with Musco's and Owner's safety requirements, to the extent these may be stricter than federal, state, or local standards, or generally recognized industry applicable standards.
   f. Subcontractor shall provide the Musco project manager with an "Emergency List" showing Subcontractor's designated medical doctor, hospital, insurance company, and any other health service providers, such list to be updated within 24 hours of any change in the information provided.
   g. Within eight (8) hours from the time of an accident (or such shorter period as laws may require), Subcontractor shall advise Musco of any accident resulting in injury to any person or damage to any equipment or facility. Upon request, Subcontractor shall promptly furnish Musco with a written report of any such accident as well as a copy of all insurance and worker's compensation claims involving the Project.
   h. Subcontractor shall maintain and inspect all construction equipment, including cranes and other lifting equipment, prior to each use. Subcontractor warrants that all equipment operators shall be qualified for each piece of construction equipment they intend to operate. Documentation of specific training is the responsibility of the Subcontractor.
   i. Jobsite shall be policed daily for compliance to the above conditions.

j. Subcontractor's employees and agents are prohibited from using drugs and alcohol on the Project property or being under the influence of alcohol or drugs while performing work on the Project. Anyone observed participating in or observed under the influence will be removed from the Project immediately and prohibited from returning, with no exceptions.

2. CONFORMANCE TO STANDARD MUSCO INSTALLATION GUIDELINES.
   a. Review and understand installation instructions are provided with every product installation.
   b. Education of installation personnel to allow for highest efficiency and lowest possibility of failure.
   c. Verify that components have been assembled per Musco installation instructions.
   d. Verify plumb of concrete foundations prior to standing of poles.

3. PROVIDING A QUALITY INSTALLATION TEAM.
   a. Subcontractor's work directly reflects the quality of the installation and may indirectly relate to the quality of the product upon which Musco's reputation is built.
   b. Provide and maintain quality installation equipment. Records of maintenance and/or calibration shall be provided upon request.
   c. Personnel shall be knowledgeable in operation of equipment as well as installation of Musco product.
   d. All personnel provided by Subcontractor shall understand the relationship developed by and between Subcontractor and Musco, also by and between Musco and the customer, and act accordingly.



Installation Instructions:
Light-Structure System™ Retrofit Lighting System

Upgrade to TLC for LED® with 5 Easy Pieces™ approach to system design

5 **Poletop Luminaire Assembly**

4 **Wire Harness**

3 **Electrical Components Enclosure**

2 **Existing Galvanized Steel Pole**

1 **Existing Precast Concrete Base**

We Make It Happen®

2021 Musco Sports Lighting, LLC · M-2768-en04-1

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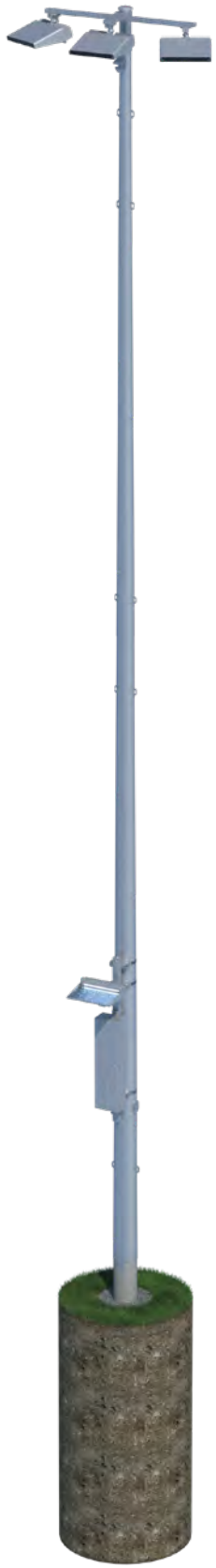

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Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear the appropriate personal protective equipment including:

- Hard hat
- Steel-toed shoes
- Leather work gloves
- Eye protection

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1.

The luminaires should be positioned so that prolonged staring into the luminaire at a distance closer than 12–37 m (40–121 ft) is not expected, per IEC/TR 62778. See table.

Luminaire	Distance
TLC-LED-400	24 m (79 ft)
TLC-LED-550	24 m (79 ft)
TLC-BT-575	20 m (65 ft)
TLC-LED-600	24 m (79 ft)
TLC-LED-900	24 m (79 ft)
TLC-LED-1200	37 m (121 ft)
TLC-LED-1500	37 m (121 ft)

About These Instructions

These instructions give basic assembly procedures for the Light-Structure System retrofit. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative.

Throughout this manual note these important symbols:

The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.

The tip symbol points out advice that makes installation easier.

The stop and check symbol signals you to stop and verify conditions before proceeding.

The recycle symbol identifies recyclable materials.

The contact Musco symbol appears in special situations where you may need to contact Musco for further information.

The go-to arrow indicates a branch in a procedure for special situations. In the case of optional equipment, the instructions may be in another document.

Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

Contractor/installer supplied tools	Function	Page
Hammer, pry-bar, banding cutters	Unloading equipment	7
Ground resistance meter	Verifying existing lightning ground system	8
Angle grinder	Removal of poletop luminaire assembly	12
Dead blow mallet	Removal of poletop luminaire assembly	12
Two 1½ ton chain-type come-alongs	Jacking pole sections together	27
Large Phillips-head screwdriver	Tightening captive screws to seal enclosure to pole hub	11, 16
Standard screwdriver	Tightening distribution lugs, 45 A disconnect switch	10, 35
Torque wrench with ⅜, 7⁄16 and 9⁄16 in sockets	Tightening luminaire retaining cable and spreader bar hardware. Must cover a range of torque from 5 ft•lb to 40 ft•lb (6 N•m to 55 N•m)	17, 32
Torque wrench to cover the following ranges: 60 in•lb (6.8 N•m) to 120 in•lb (13.6 N•m) 16 ft•lb (21.7 N•m) to 40 ft•lb (54.2 N•m)	Proper torquing of fasteners	17 – 32
Electrical fish tape, electrician's tape	Feeding wire harness through pole	17
Spray paint, chalk, or flags	Marking points to sight in aiming	28
10 ft (3 m) stepladder or small line truck	Connecting supply wires to electrical enclosure	34, 35
Musco supplied tools	**Function**	**Page**
9⁄16 in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	11 – 32
1 1⁄16 in socket, extension, breaker bar, and 1 1⁄16 in wrench	Tightening structural fasteners	13, 31
7⁄16 in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	26
5⁄32 in hex key	Attaching handhole covers on base and steel pole	33, 35
3⁄16 in hex key	Attaching grounding conductors inside electrical enclosure	35
5⁄16 in hex key	Attaching grounding conductors inside pole at handhole	35
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	35
Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)	Lubricating pole slip-fit connections	27
Machinery needed	**Function**	**Page**
Crane or forklift with nylon strapping and 8 ft (2.5 m) sling (sized to weight of poletop luminaire assembly)	Unloading materials, poletop assembly	7, 11 – 13, 21, 27
Manlift or bucket truck	Poletop setting and removal, enclosure setting and removal	7, 11 – 13, 21, 27
Load-rated crane, nylon slings, and shackles	Setting poletops	9 – 13, 21 – 23, 25 – 35

Documents You Need

- ❑ Musco *Pole Assembly Drawing*
- ❑ *Field Aiming Diagram*
- ❑ *Control System Summary*

If you do not have all of these documents, contact your local Musco representative.

Before You Begin

Electrical System Requirements

A qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

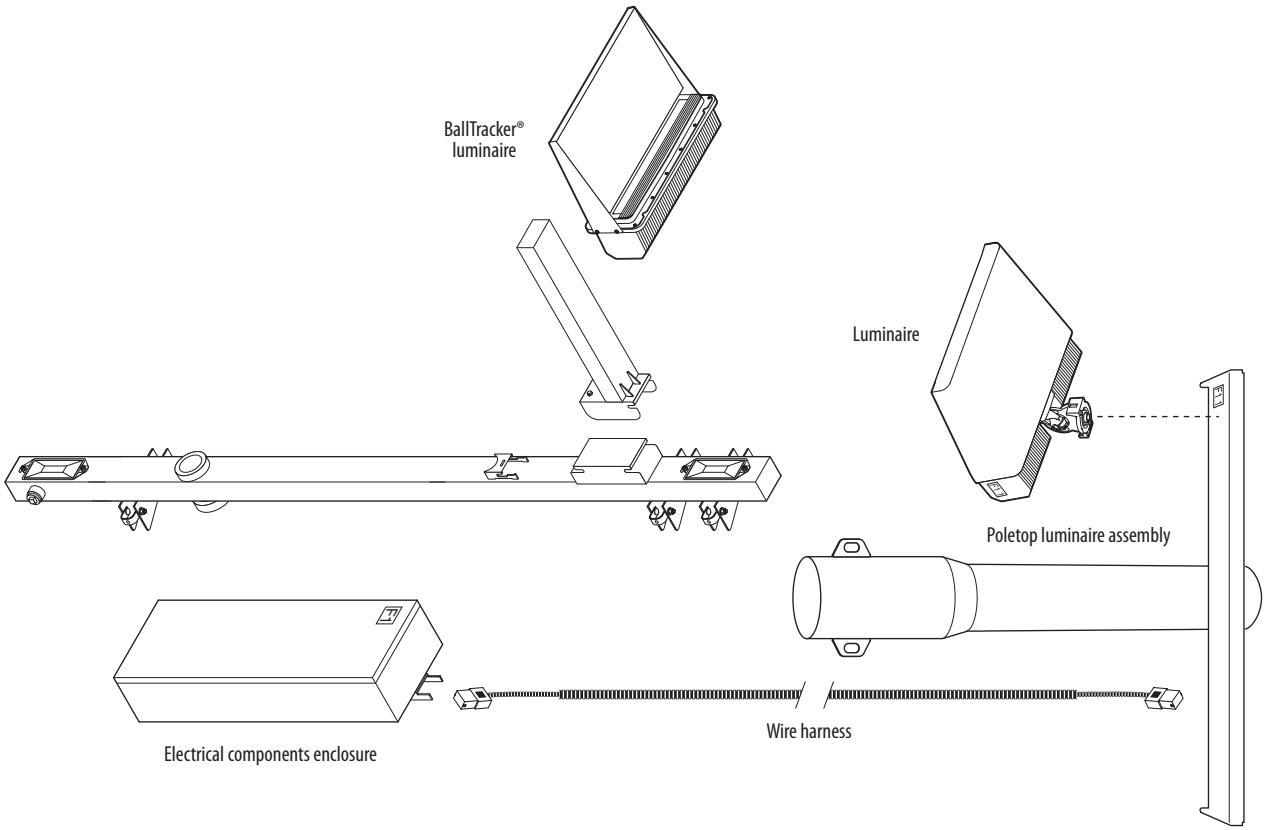
Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

Components Matching and Labeling

Pole locations are identified by a pole ID (A1, A2, B1, B2, etc.) on the *Field Aiming Diagram*. These IDs are also marked on the individual components:

- Poletop luminaire assemblies, bolt-on crossarms, and luminaire shipping cartons
- Wire harnesses
- Electrical components enclosures



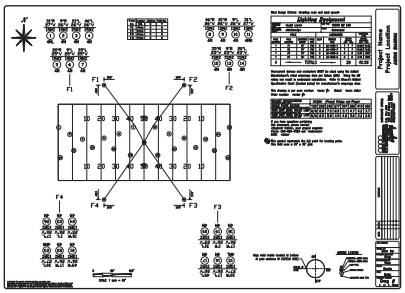
Before You Begin

Documents We Provide

Field Aiming Diagram

The *Field Aiming Diagram* is your map for locating all poles on your project. It gives this information:

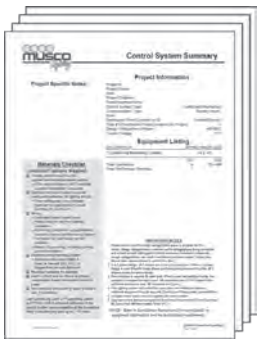
- Pole IDs, locations, and heights
- Luminaire IDs
- Common aiming point for all poles, or individual aiming points for each pole
- Full load current for each luminaire



Control System Summary

Projects with a control system include a *Control System Summary*. It gives this information:

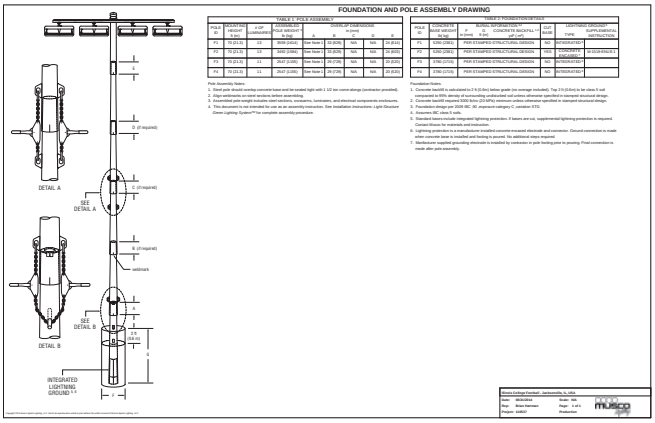
- Control system diagram and details
- Contactors and cabinets
- Lighting circuits
- Voltage, phase, and frequency
- Full load current for each circuit



Musco Pole Assembly Drawing

This drawing provides information related to the installation of the poletop luminaire assembly.

- Poletop or crossarm weight
- Poletop luminaire assembly minimum overlaps



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Before You Begin

Unloading Instructions

A typical shipment includes electrical components enclosures, wire harnesses, and poletop luminaire assemblies with luminaires.

For ease of installation, set all matched components by the proper pole location as noted on the *Field Aiming Diagram*.

Tools/Materials Needed

- ❑ Crane with nylon web sling or forklift (load rated)
- ❑ Hammer
- ❑ Pry bar
- ❑ Banding cutters

Warning
Crushing hazard.

Do not cut shipping bands or remove blocking from equipment until it is supported by unloading equipment.

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store electrical components enclosures and luminaires in a dry location or cover with tarp until ready to install.

If additional information is needed, contact your local Musco representative.

Please recycle.
Luminaires, wire harnesses, and other components are shipped in recyclable cardboard packaging.

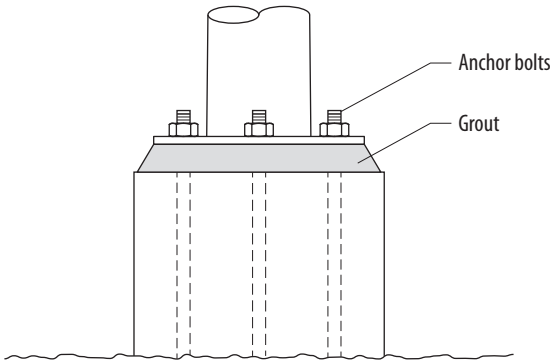
Installation Instructions: **Light-Structure System™ Retrofit Lighting System**

Before You Begin

Inspections

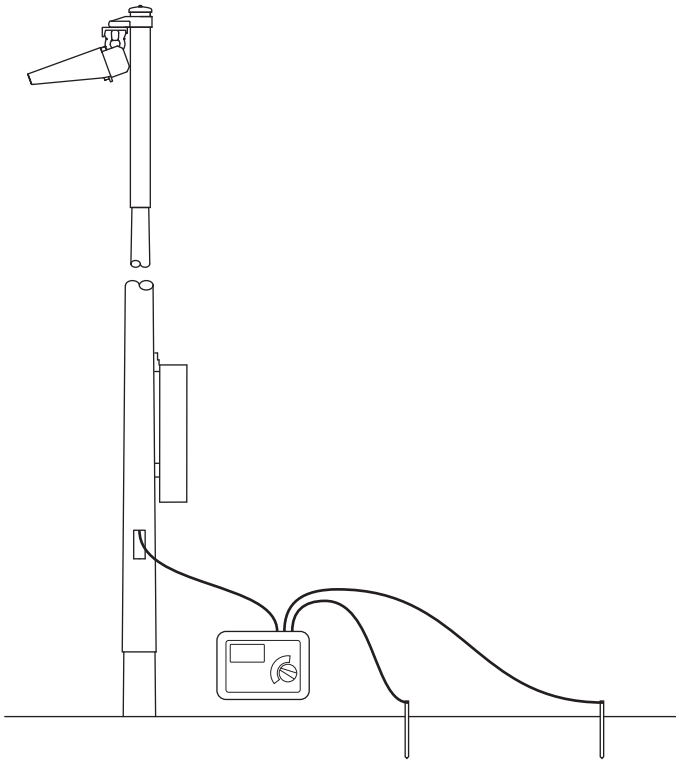
1 A qualified inspector must examine the base and pole sections for damage or prior field modifications.

2 Repair grout on baseplate poles (if necessary).

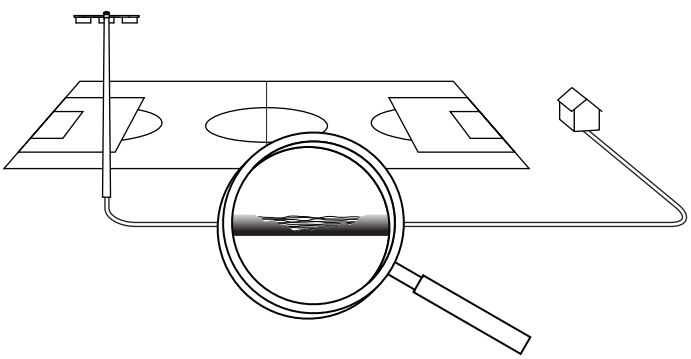


3 If pole is equipped with an external ground rod, test earth ground connection of pole. If greater than 25 ohms, install additional ground rod and retest.

Repeat until < 25 ohms.



4 To the extent possible, inspect power supply wiring for good condition. Leakage current should not exceed 20 mA.



Notify your local Musco representative if concerns are identified with any of these items.

Disassembly

Overview

Remove the existing equipment to be replaced: electrical components enclosures, wire harness, and poletop luminaire assembly (or bolt-on crossarms).

Tools/Materials Needed

Musco Supplied (For bolt-on crossarms.)

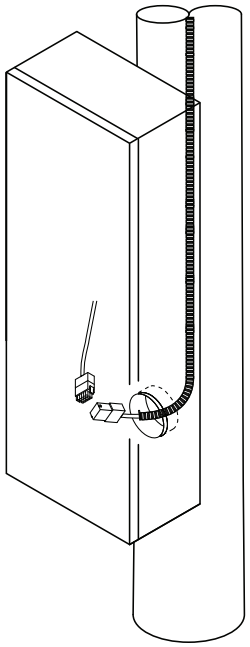
- ❑ 1 1/16 in socket, ¾ in drive
- ❑ Breaker bar, ¾ in drive
- ❑ 4 in extension, ¾ in drive
- ❑ 1 1/16 in wrench

Contractor Supplied

- ❑ 9/16 in wrench, 9/16 in socket and ratchet
- ❑ Angle grinder with metal cutting wheel
- ❑ Crane and slings to support poletop luminaire assembly
- ❑ Dead blow hammer
- ❑ Ratchet, ¾ in drive

Disassembly

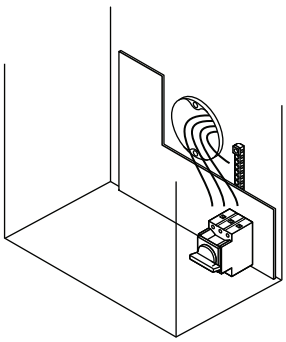
1 In electrical components enclosure, disconnect pole harness from enclosure harness. Feed end of pole harness into pole interior. Cut off connector if necessary.



Warning

Risk of electrical shock

Ensure all circuits are disconnected before proceeding



2 Disconnect electrical supply wiring and equipment grounding conductor.

3 Remove wire harnesses between top, middle, and bottom boxes.

4 Remove wiring between stacks.

TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Disassembly

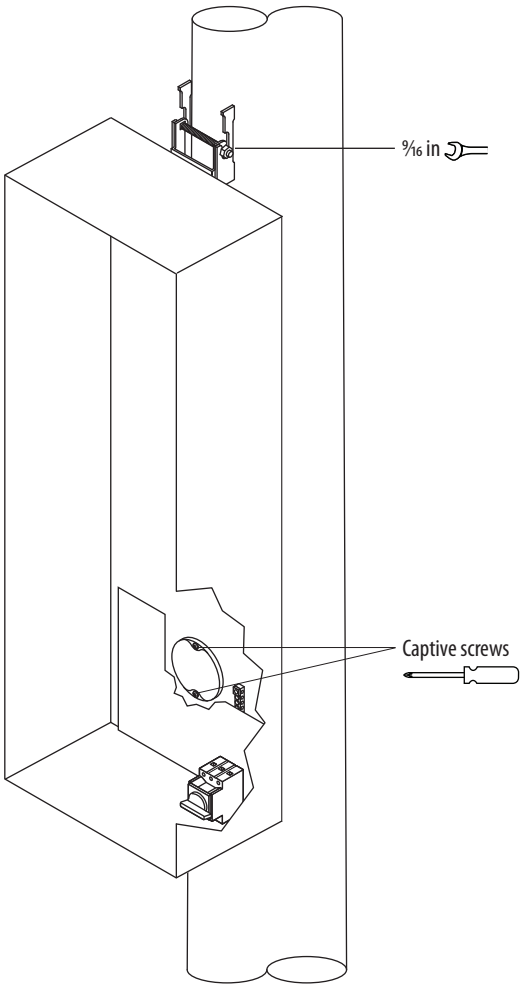
5 Using 9⁄16 in wrench and Phillips screwdriver, loosen enclosure hanger bolts, and captive hub screws.

6 Using a crane and sling, remove enclosures from the stack, starting at the top.

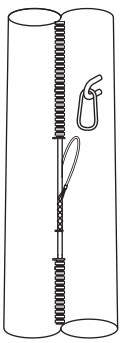
Caution

Electrical components enclosures are heavy.

Enclosures may weigh up to 225 lb (102 kg). Lift with caution.



7 Disconnect middle wire support grip on poles greater than 80 ft (24.5 m).



Leave the pole harness connected to the poletop luminaire assembly. It will pull out as the poletop is removed.

Disassembly

8 Determine if entire poletop luminaire assembly (welded crossarms) or crossarms only (bolted crossarms) will be replaced.

If replacing bolt-on crossarms, skip to *Bolt-on Crossarm Removal.*

9 Using 9⁄16 in wrench, loosen set screw.

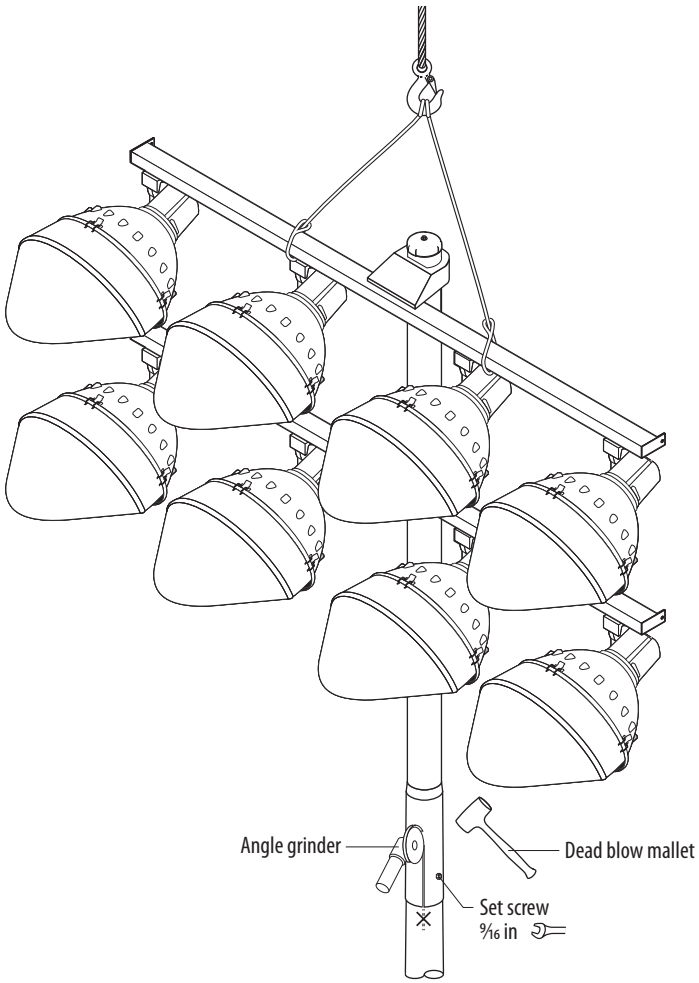
10 Use crane to sling around the top crossarm and provide a slight separating force to the poletop.

Warning
Crushing hazard.

Do not attempt to "pop off" the poletop using the crane only as the high separating forces can cause an uncontrolled separation and potential injury.

11 Use an angle grinder to make a relief cut in the overlap area of the poletop luminaire assembly. Do not damage the pole section underneath the poletop.

12 Tap on the poletop with a dead blow mallet until it begins to move and separate.



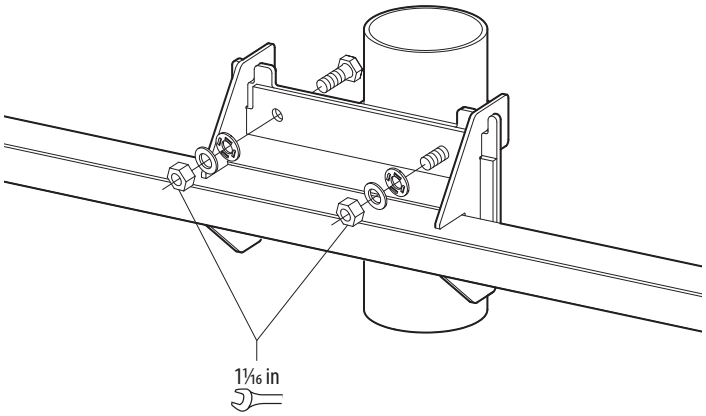
TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Disassembly

Bolt-On Crossarm Removal

1 Use crane and sling to support crossarm.

2 Use supplied breaker bar, 1 1/16 in socket, extension, and wrench to remove crossarm retaining bolts.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

Overview

The electrical components enclosure is factory-wired and tested. It contains essential electrical components of the lighting system in an accessible location.

Tools/Materials Needed

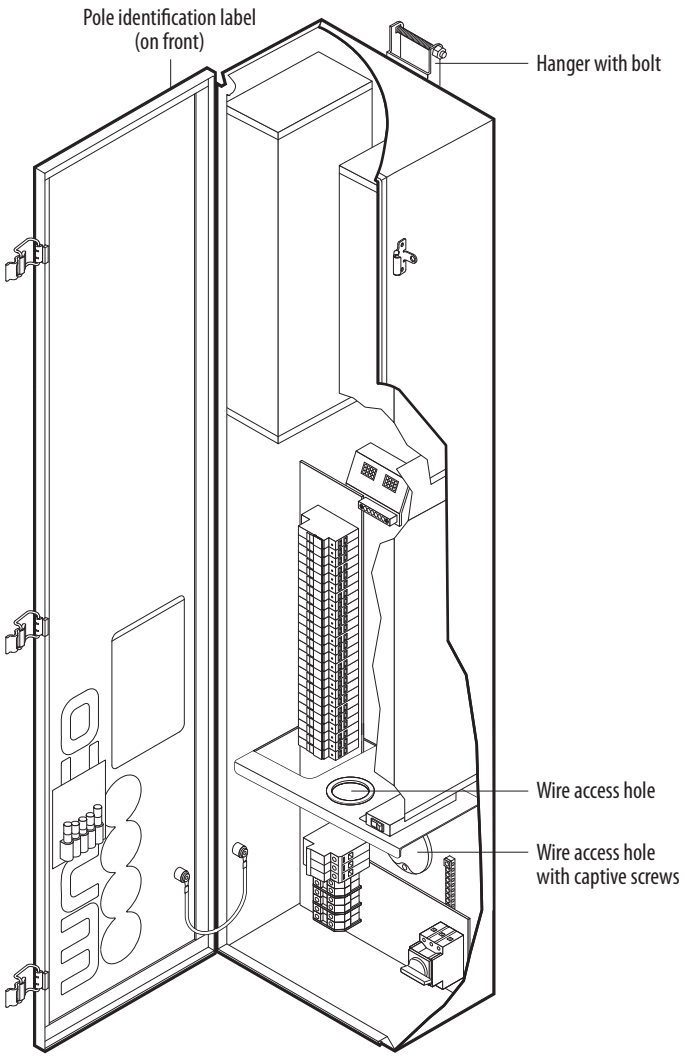
Musco Supplied

- ❑ ½ and 9⁄16 in offset combination wrenches
- ❑ Snips
- ❑ *Field Aiming Diagram*

Contractor Supplied

- ❑ Torque wrench with ½ and 9⁄16 in sockets
- ❑ Large Phillips-head screwdriver
- ❑ Measuring tape
- ❑ Marker
- ❑ 10 ft (3 m) stepladder or small line truck

Consult project documents to determine if your enclosures will mount on existing hangers or if new mounting bracket has been provided.



Electrical Components Enclosure and BallTracker® Luminaire

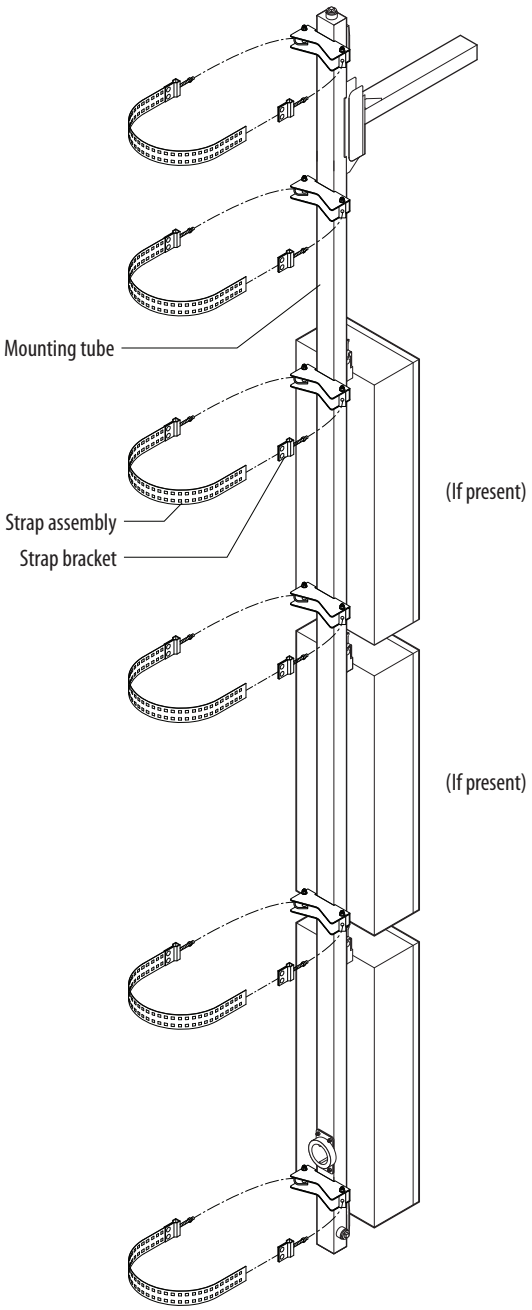
Round Pole Strap Selection

Diameter	Round Pole Strap Length
0 – 17 in (0 – 432 mm)	45 in (1143 mm)
17.01 – 22 in (432 – 559 mm)	60 in (1524 mm)
22.01 – 28 in (559 – 711 mm)	78 in (1981 mm)
28.01 – 34 in (711 – 864 mm)	96 in (2438 mm)
34.01 – 40 in (864 – 1016 mm)	114 in (2896 mm)
40.01 – 46 in (1016 – 1168 mm)	132 in (3353 mm)

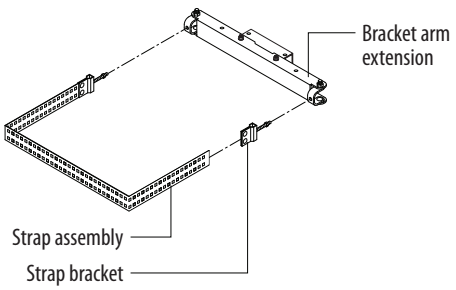
Square Pole Strap and Bracket Selection

Width	Strap Length	Bracket Arm Extension Width
0 – 12 in (0 – 304 mm)	45 in (1143 mm)	14 in (356 mm)
12.01 – 16 in (304 – 406 mm)	60 in (1524 mm)	18.5 in (470 mm)
16.01 – 20 in (406 – 508 mm)	78 in (1981 mm)	22.5 in (572 mm)
20.01 – 24 in (508 – 610 mm)	96 in (2438 mm)	26.5 in (673 mm)
24.01 – 28 in (610 – 711 mm)	114 in (2896 mm)	30.5 in (775 mm)

Mounting tubes are marked with pole ID. One strap assembly and one strap bracket required per mounting arm (as shown).



Round pole option (shown)



Option for square pole

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Electrical Components Enclosure and BallTracker® Luminaire

Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

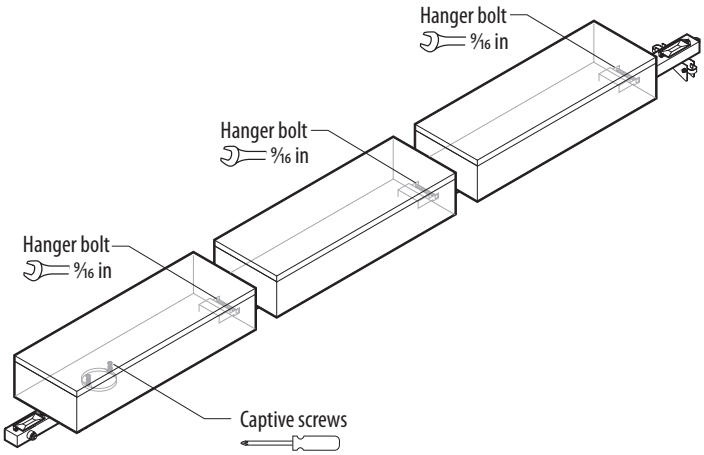
Assembly Procedure

Caution
Electrical components enclosures are heavy.

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

1 Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillips-head screwdriver. Tighten hanger bolt with 9⁄16 in wrench.

2 Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with 9⁄16 in wrench.



Electrical Components Enclosure and BallTracker® Luminaire

3 If pole includes a BallTracker® luminaire, attach bracket using ¾ in socket and torque wrench. Tighten captive bolts to 40 ft•lb (54 N•m).

4 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route crossarm wire harness to upper handhole for connection to pole harness.

Ensure crossarm wire harness is not pinched between mating plates.

5 Attach luminaire using 7⁄16 in wrench. Tighten captive screws until fully tight. Do not exceed 20 ft•lb (27 N•m).

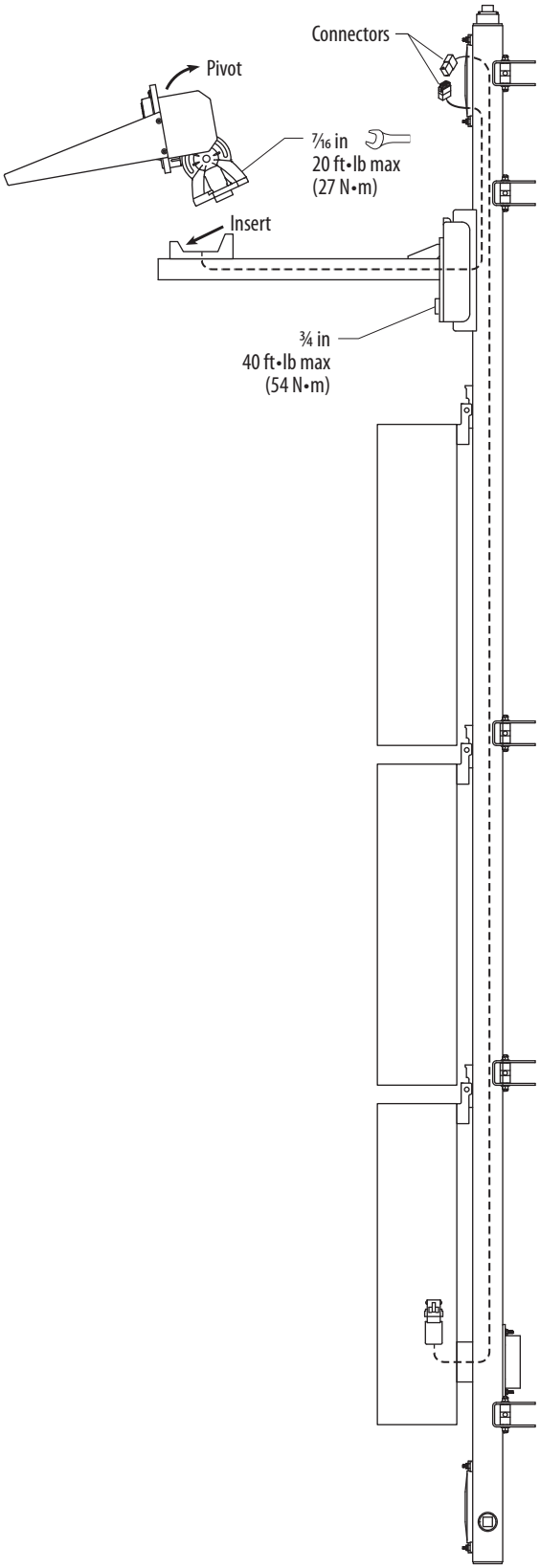
6 Pull BallTracker® wire harness through tube.

Feed bottom of harness into enclosure hub.

7 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use handholes to access tube and aid in routing pole harness. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

8 Attach support grips at top handhole.

9 Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.



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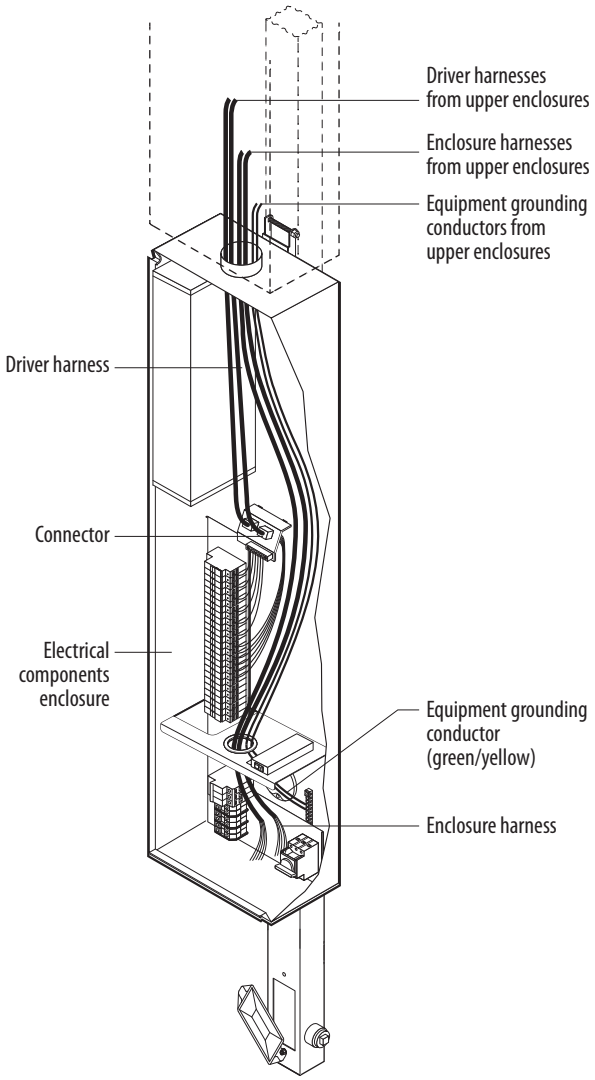
Electrical Components Enclosure and BallTracker® Luminaire

Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician.

10 Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

11 Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.

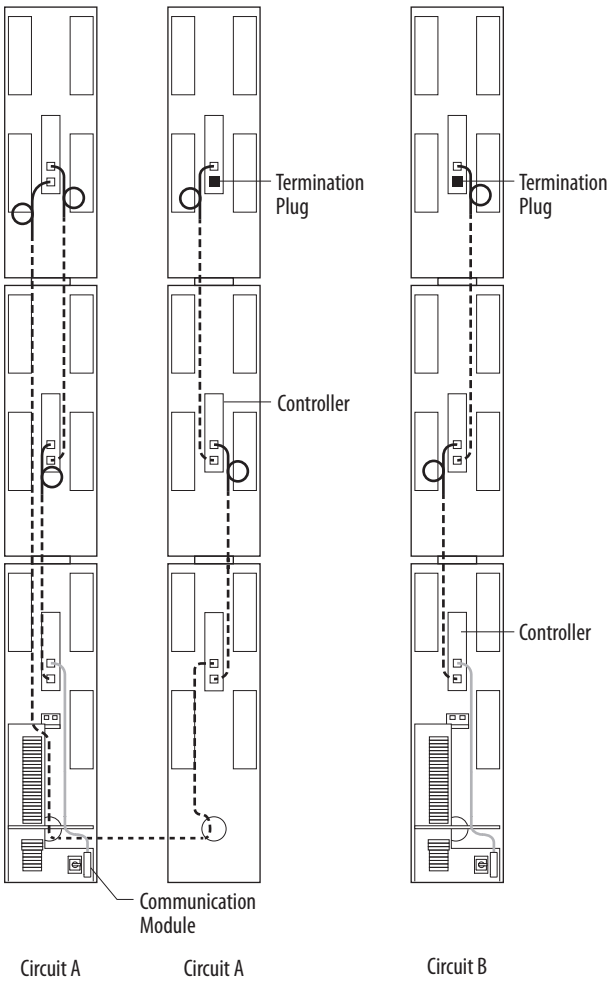


Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 9–10 if controller not present

12 Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown.

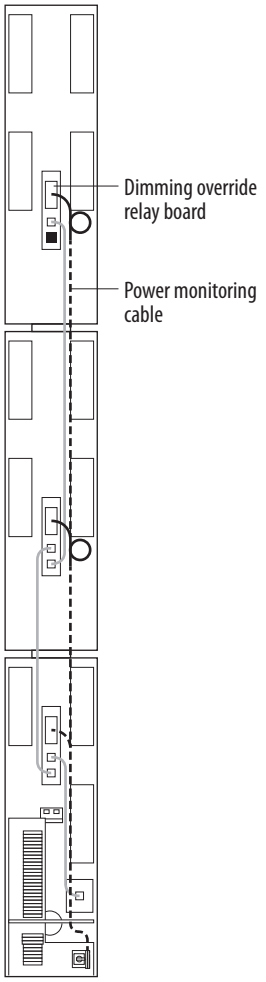
Connections between stacks must be done after stacks are mounted on the pole.



Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 10 if emergency egress lighting dimming override relay board is not present.

13 Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



Electrical Components Enclosure and BallTracker® Luminaire

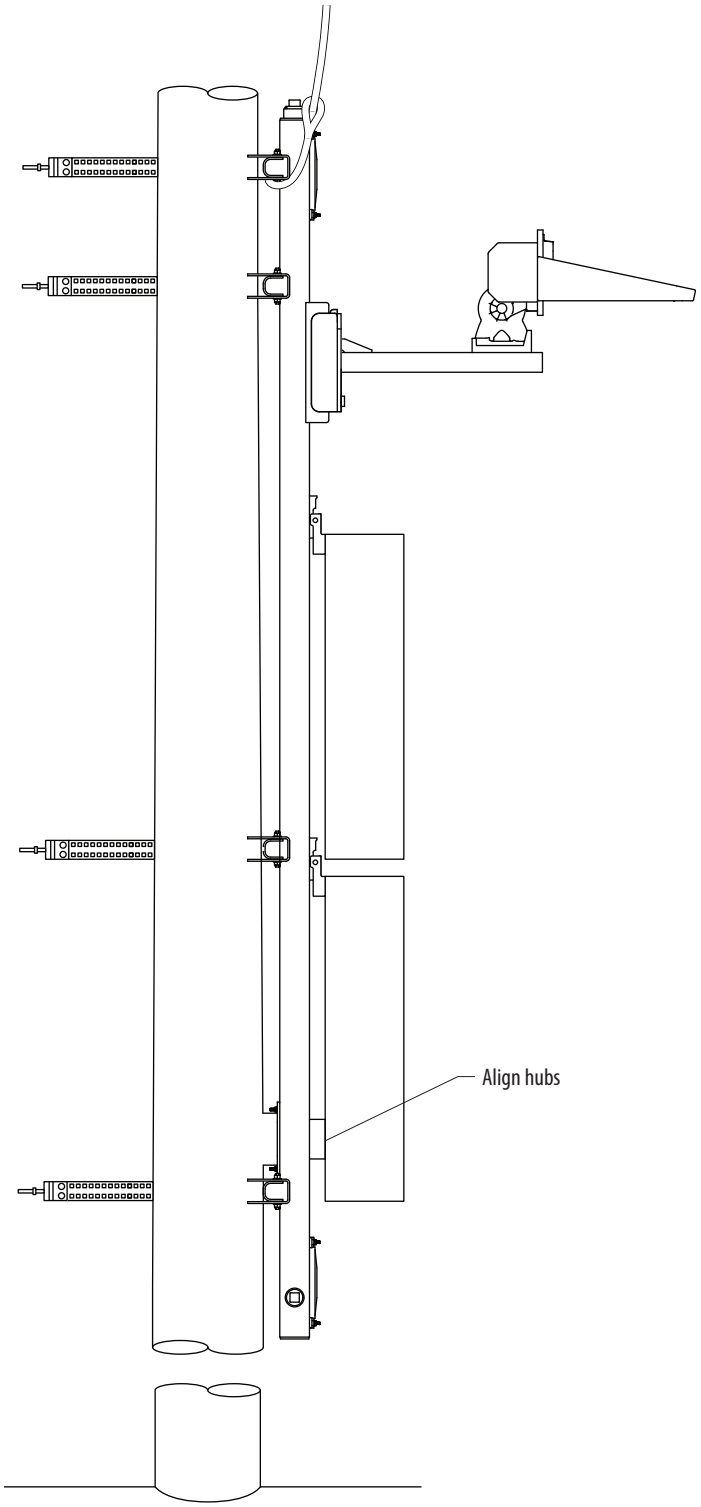
Installation Procedure

- ☑ Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

1. Sling enclosure stack under the welded arm for strapping connections (not under the BallTracker luminaire crossarm) and lift enclosure stack.
2. Align hub on tube with pole hub.

- ☑ Enclosure stacks that are not mounted on a pole hub will include cover plates for tube opening. Ensure these plates are installed.

- ☑ BallTracker® luminaires should face the field. If pole hub does not face the field, contact your Project Engineer or local Musco representative.



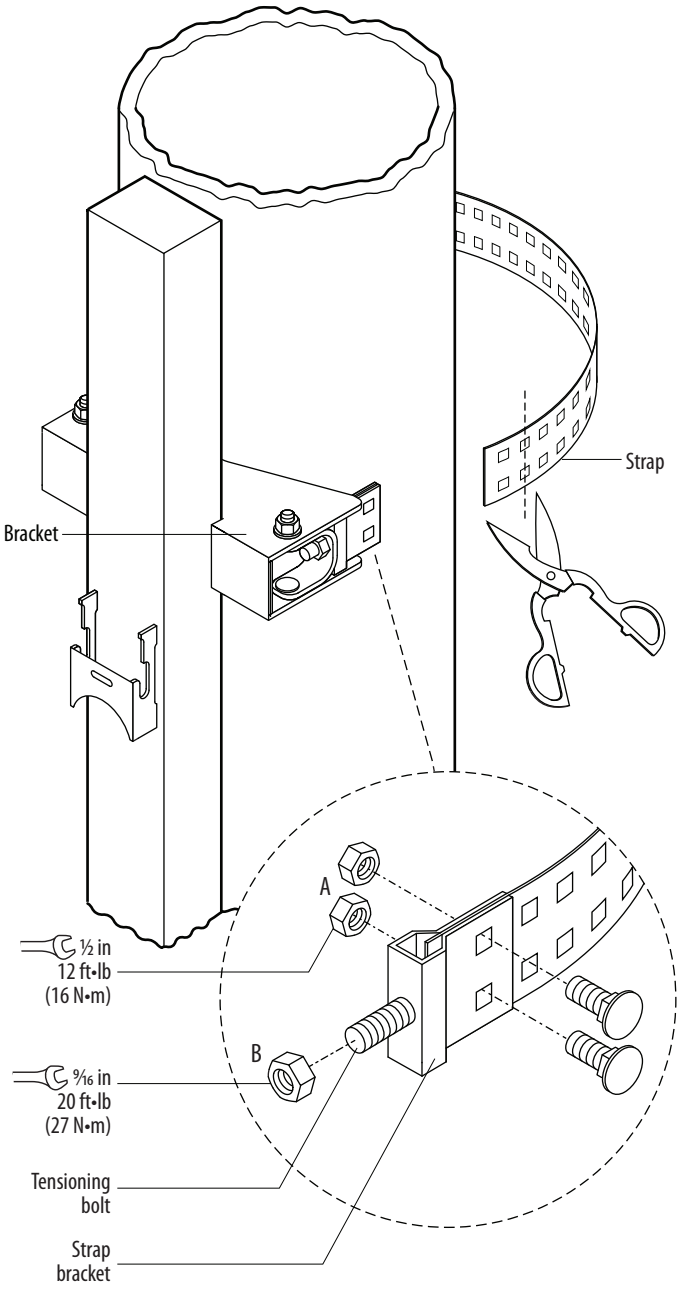
Electrical Components Enclosure and BallTracker® Luminaire

3 Cut straps to required length. Pull tight around pole and trim excess within 1 in (25 mm) of strap bracket. Cut across square holes, not between them.

4 Attach brackets to pole. Torque 5⁄16 in strap bracket hardware A to 12 ft•lb (16 N•m) using ½ in socket and torque wrench. Torque all ⅜ in tensioning nuts B to 20 ft•lb (27 N•m) using 9⁄16 in socket and torque wrench.

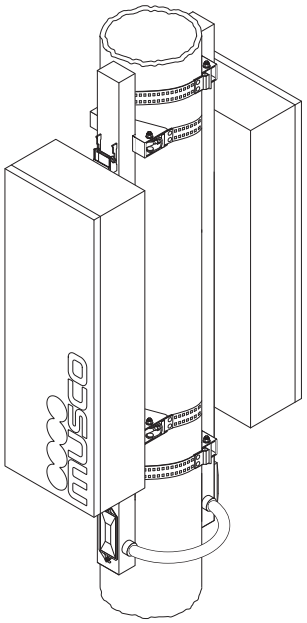
Caution
Falling equipment hazard
Ensure you meet torque values specified on all tensioning hardware.

If tensioning bolt is fully seated and strap is not yet tight, trim strap at next set of holes and repeat step 4.



Electrical Components Enclosure and BallTracker® Luminaire

5 Repeat steps 3 and 4 for back-to-back or multiple stacks.



6 Use 1¼ in hubs provided to run flex conduit between electrical component enclosure stacks.

TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Luminaire Attachment

Overview

Luminaires are factory built and shipped in individual cartons. They are aimed in the factory and ready for installation. Do not disassemble knuckle.

Tools/Materials Needed

Musco Supplied

❑ 7⁄16 in ratcheting combination wrench

Contractor Supplied:

❑ Torque wrench with 7⁄16 in socket

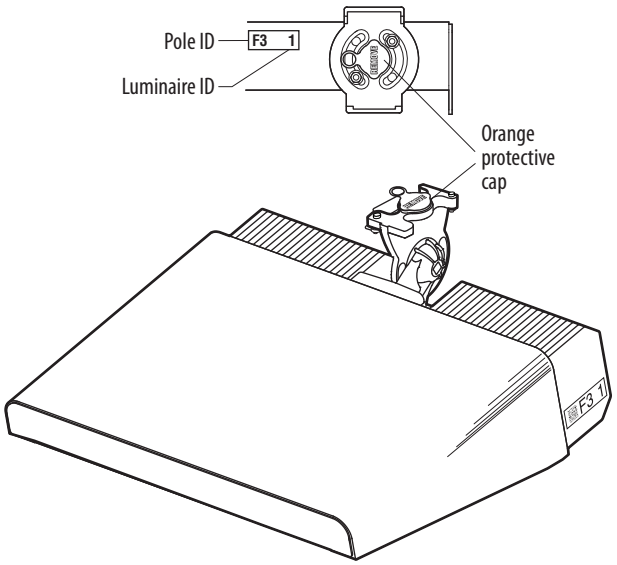
Leave luminaires in box until ready to assemble. Keep protective cover on luminaire until ready to set pole. Do not leave luminaires unassembled from crossarm in wet conditions.

Assembly Procedure

Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1 Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.



Warning

Rotation may be required to assemble all luminaires onto the poletop luminaire assembly. Do not stand under poletop when lifting. Steady with two people holding crossarms. Allow for poletop to safely rotate around when it is high enough for crossarms to clear the ground.

Caution

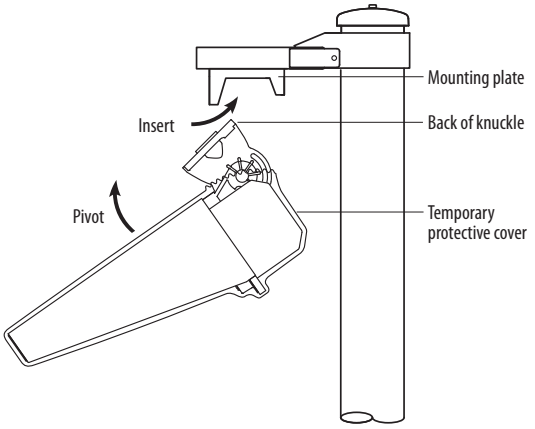
Equipment Damage

Properly support poletop to ensure luminaires do not get damaged.

TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Luminaire Attachment

2 Match luminaire ID to crossarm and install luminaire onto mounting plate. Insert back of knuckle into mounting plate and pivot into position.



Note: The luminaire style may vary from what is shown.

Luminaire	Weight
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)

Caution

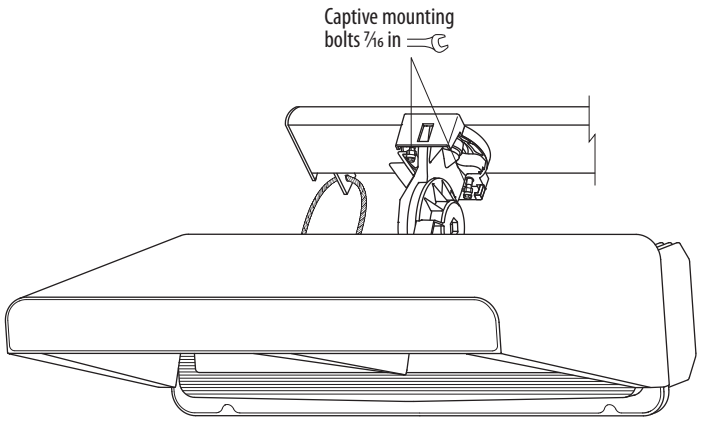
Luminaire may be heavy. Lift carefully with two people to avoid injury.

Luminaire Attachment

3 Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight - continue tightening. Torque must not exceed 20 ft•lb (27 N•m). To avoid overtightening, use provided 7⁄16 in combination wrench.

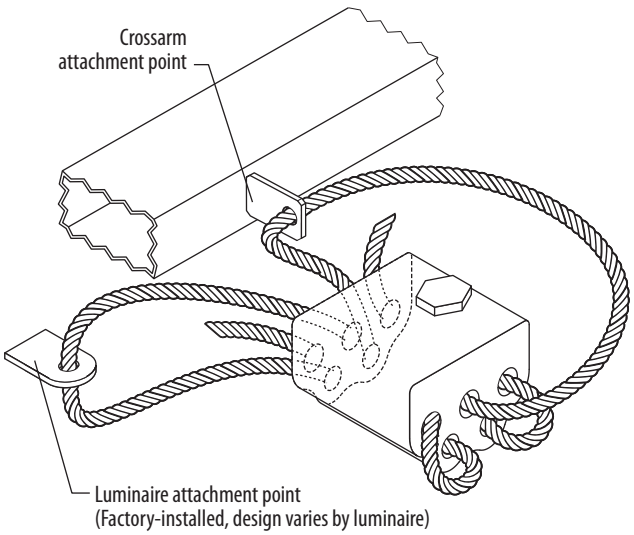
Warning
Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



4 Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

5 Using 7⁄16 in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).



Poletop Luminaire Assembly

Overview

The galvanized steel pole and poletop luminaire assembly are designed to slip-fit together. Jacking ears on pole section and poletop assembly provide attachment points to pull sections together. The Musco *Pole Assembly Drawing* gives minimum overlap specifications for each poletop luminaire assembly.

Tools/Materials Needed

Musco Supplied

- ❑ Musco *Pole Assembly Drawing*
- ❑ 9/16 in wrench
- ❑ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Contractor Supplied

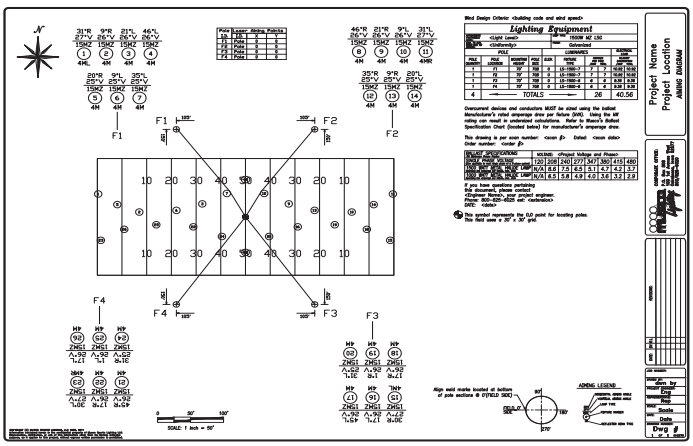
- ❑ Two 1½ ton chain come-alongs

If pole utilizes bolt-on bars, skip to next section. See Musco *Pole Assembly Drawing*.

Assembly Procedure

Verify pole ID on each poletop luminaire assembly matches pole location on *Field Aiming Diagram*. Pole ID is labeled on crossarm.

1 Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



Poletop Luminaire Assembly

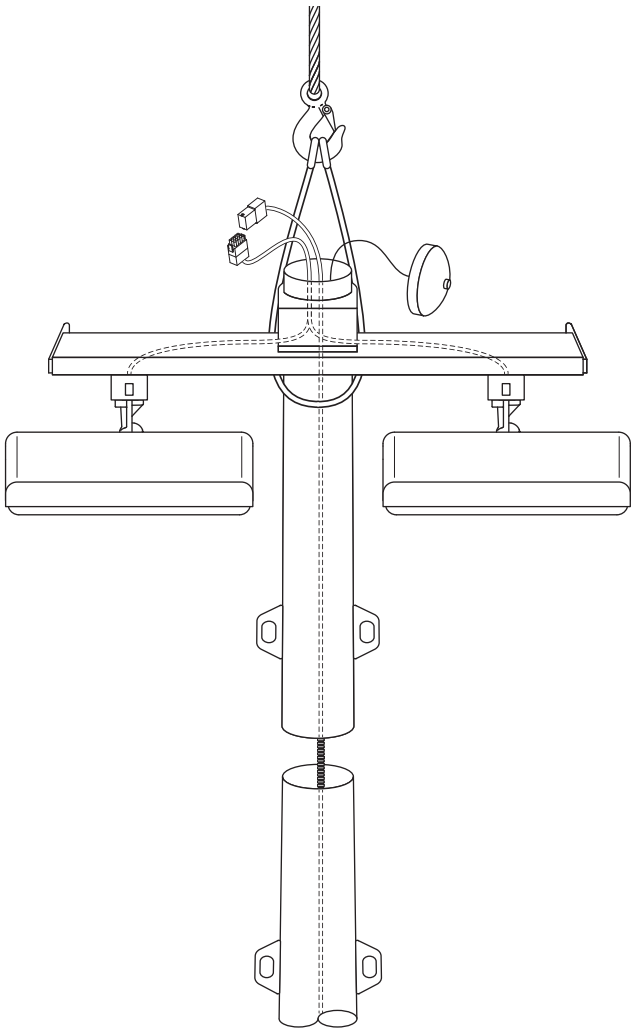
2 Turn on pole alignment beam.

3 Hook pole harness wire support grip to the poletop luminaire assembly u-hook and bundle the pole harness to the bottom crossarm.

4 Lubricate top of steel pole section with supplied dishwashing liquid.

5 Sling and lift poletop luminaire assembly into place.

6 Carefully lower the pole harness(es) down into the pole. The attached cable support hook will prevent the pole harness from dropping.

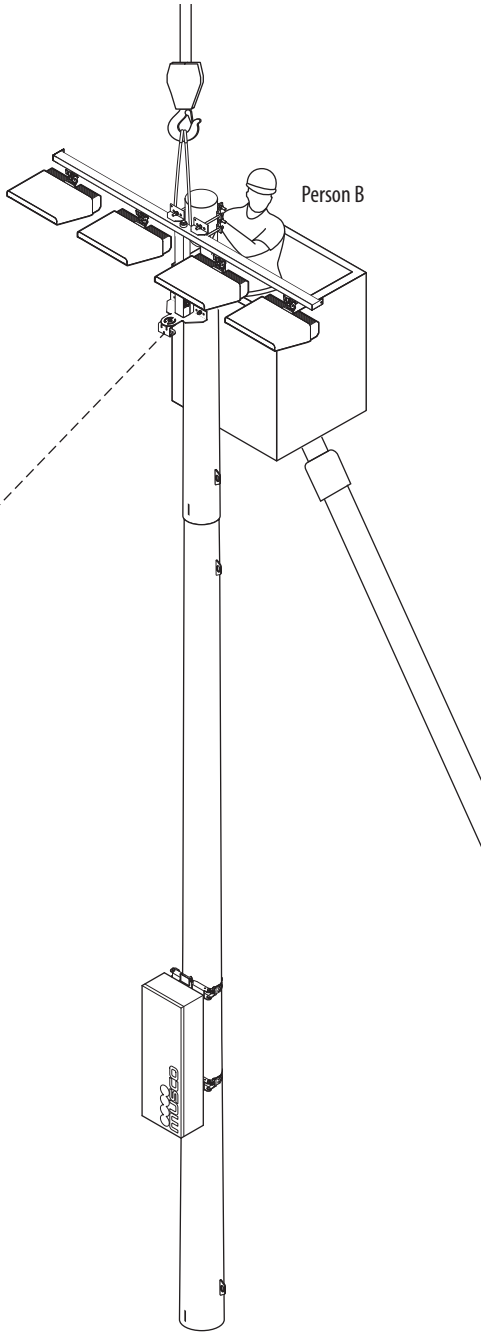


Poletop Luminaire Assembly

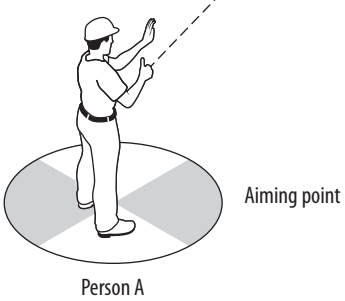
7 Aim luminaire assembly using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is attached to a luminaire. Walk parallel to crossarms until you see beam. Signal person B to rotate luminaire assembly left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



Warning
Falling material hazard
If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.



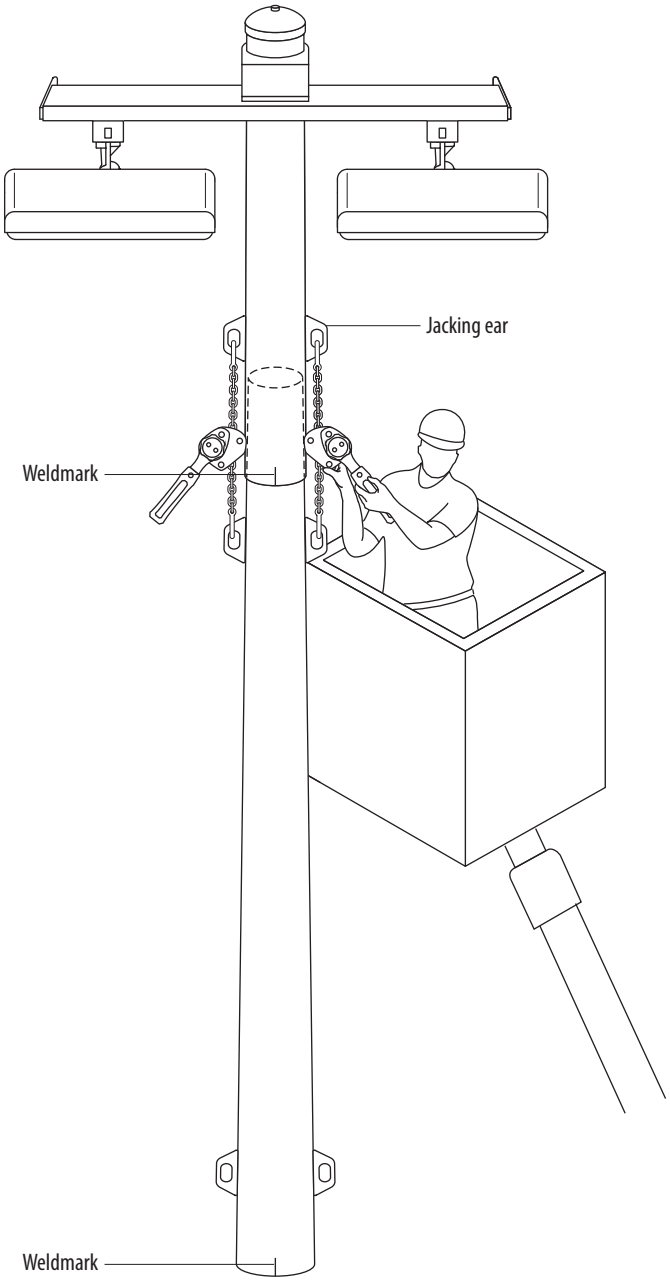
Warning
Laser radiation hazard
Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, Laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.

Poletop Luminaire Assembly

8 Using two 1½ ton come-alongs, pull poletop luminaire assembly onto pole evenly until tight. Ensure minimum overlap per Musco *Pole Assembly Drawing*.

✓ Ensure alignment is maintained while tightening.

9 Tighten set screw using 9⁄16 in wrench.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Bolt-on Crossarms

Overview

Bolt-on bar style may vary from what is shown. Replacement procedure is identical.

Tools/Materials Needed

Musco Supplied:

- ❑ ¾ in drive 1⅛ in socket
- ❑ ¾ in drive breaker bar
- ❑ ¾ in drive 4 in extension
- ❑ 1⅛ in wrench
- ❑ Spreader bars
- ❑ ⅜ in fasteners (for spreader bars)
- ❑ ⅝ in structural fasteners
- ❑ ⅝ in wrench

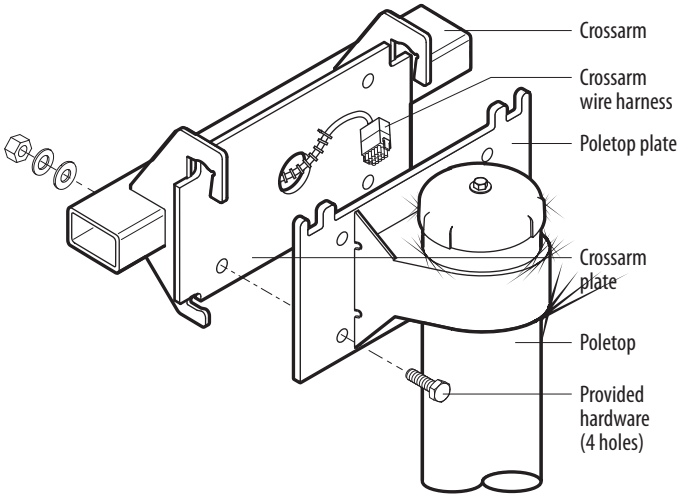
Contractor Supplied:

- ❑ Torque wrench with ⅝ in socket

Assembly Procedure

Verify pole ID on crossarm matches ID of pole.

Note: Each crossarm is factory assembled for a specific position on poletop section to ensure correct aiming. Top side of crossarm is labeled with crossarm's position number. Example: Position 1 is installed on first position from top of poletop section.



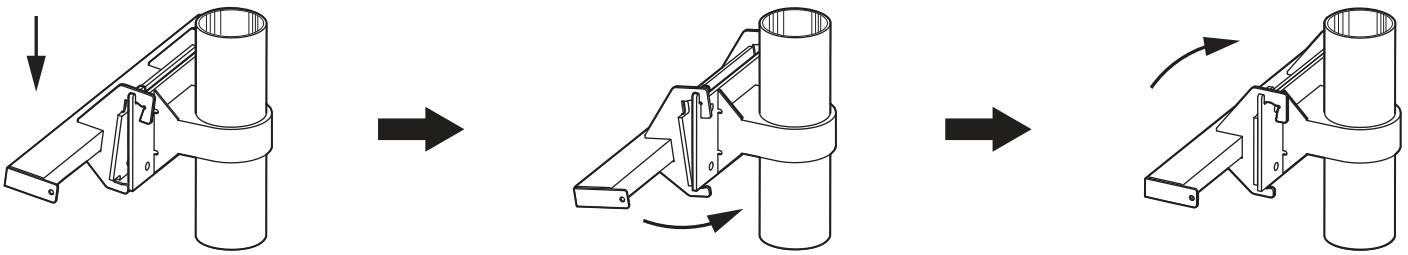
1 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route wire harness for crossarms 1–3 to top of pole.

Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2 Position crossarm as shown below.

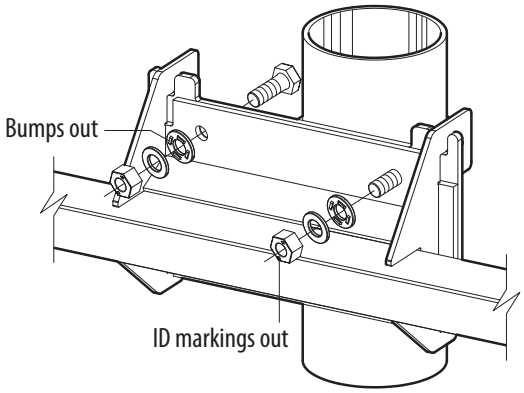
Ensure crossarm wire harness is not pinched between mating plates.



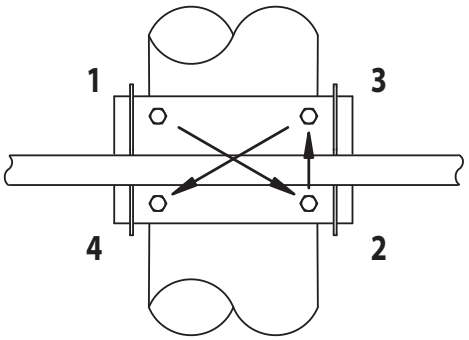
TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Bolt-on Crossarms

3 Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



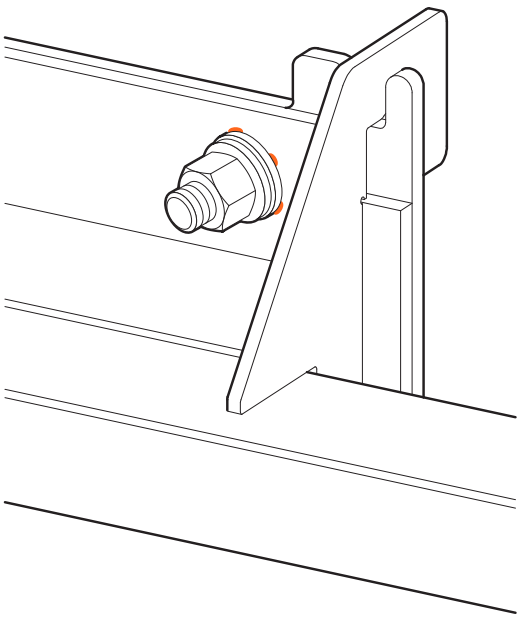
4 Snug all nuts. Using supplied 1 1/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



5 Using supplied breaker bar, 1 1/16 in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.

6 Repeat steps 1–5 for remaining crossarms.

Do not reuse structural fasteners. Discard if removed or loosened after tightening.



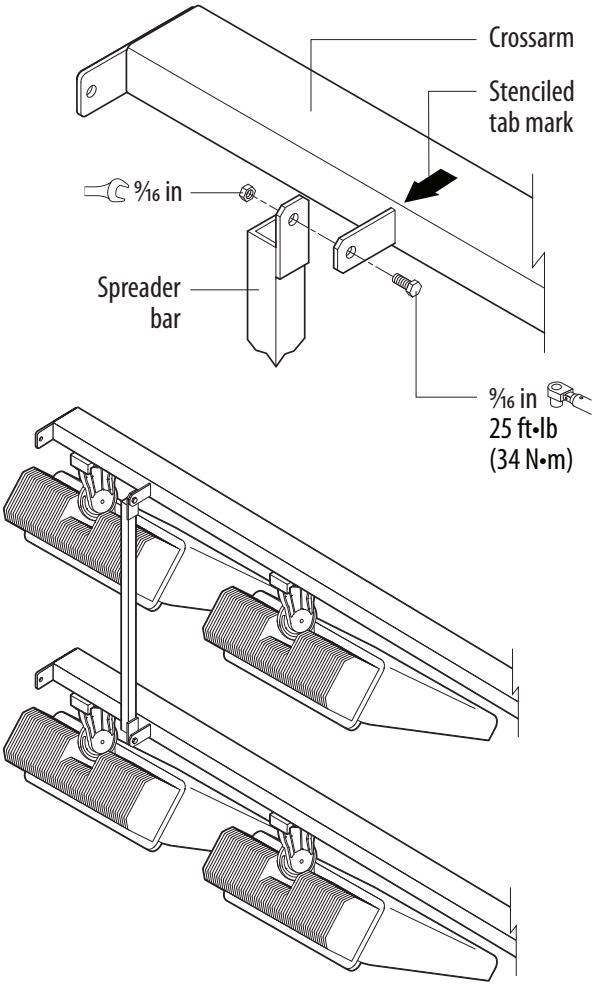
TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Bolt-on Crossarms

Refer to the Musco *Field Aiming Diagram* to determine if a pole requires spreader bars. If so, spreader bars are bundled together and marked with the pole ID. Additionally, the pole crossarms are stenciled indicating which tabs to use. Crossarms are joined in groups of two or three with the greatest grouping on top; do not form other groupings.

7 Install spreader bars with ⅜ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30½ in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Wire Harness

Overview

Tools/Materials Needed

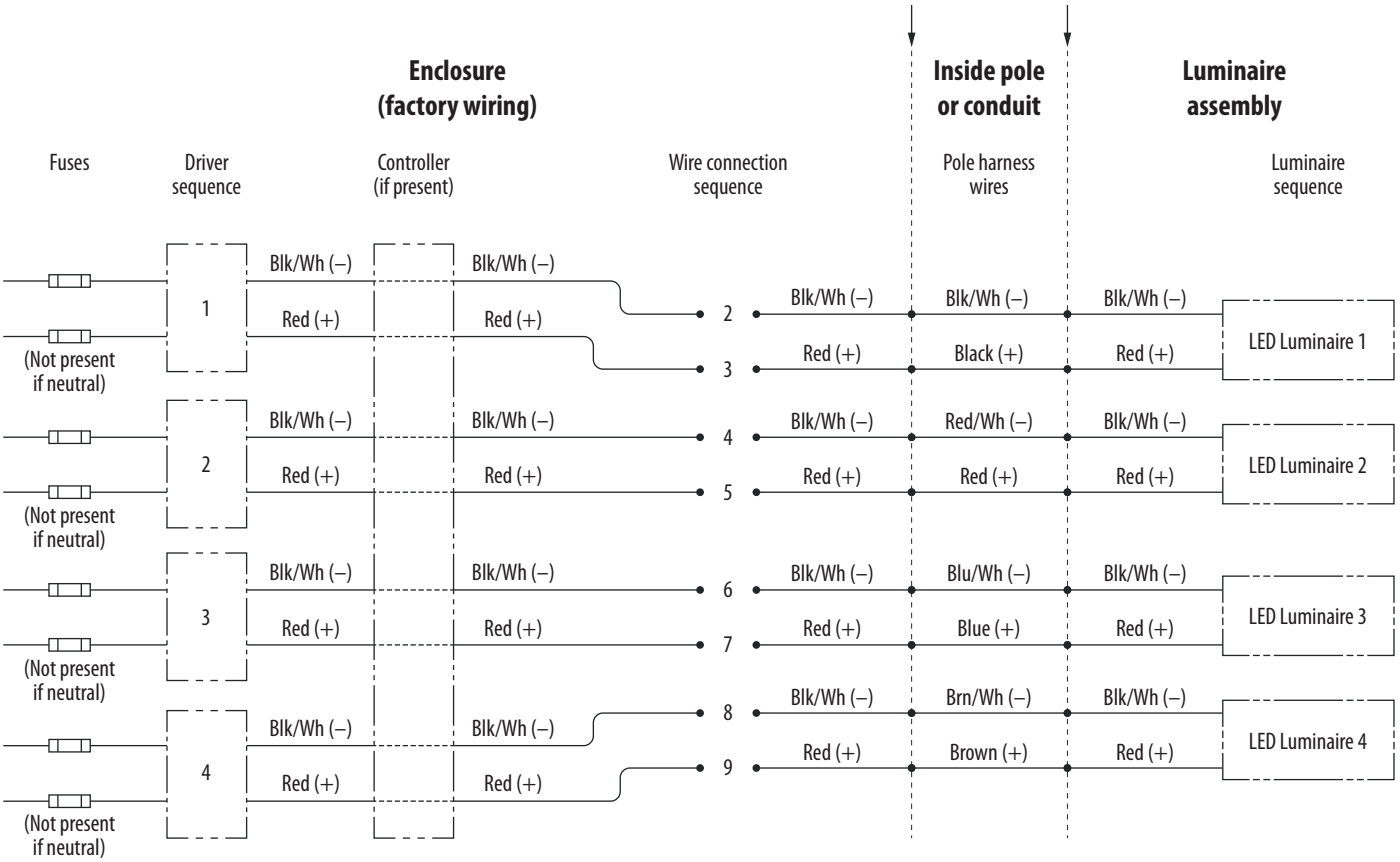
Musco Supplied

- ❑ 5⁄32 in hex key
- ❑ 9⁄16 in wrench

Contractor Supplied

- ❑ Fish tape
- ❑ Electrician's tape

The factory-built wire harness connects the electrical components enclosure to the poletop luminaire assembly.



Notes:

1. Pole harness wire color indicated if provided by Musco.
2. Enclosure factory wiring may be different than shown above. One pair of wires per luminaire is required in pole harness.

Wire Harness

Assembly Procedure

Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

1 Remove handhole covers using 5⁄32 in hex key. Remove polecap using 9⁄16 in wrench.

2 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use lower handhole to access enclosure hubs. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

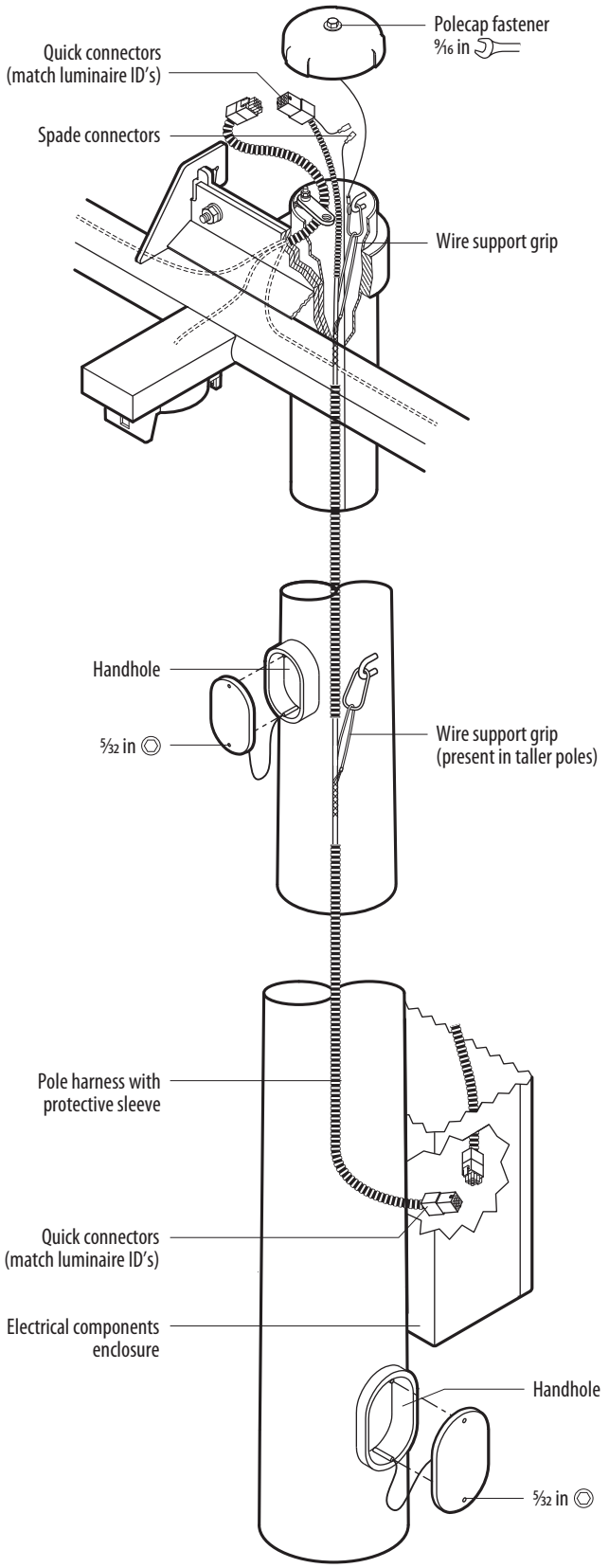
3 Attach support grips at midpole (if present).

4 Mate quick connectors at poletop and inside first stack of electrical components enclosures. Match driver/ luminaire IDs.

For additional stacks of enclosures, connect pole harnesses using the Musco-provided LEVER-NUTS wire connectors. Match luminaire ID and wire polarity per each wire label.

Use electrical tape to ensure LEVER-NUTS® levers stay secure and don't snag on surrounding wires.

5 Replace handhole covers and polecap.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX
ATTACHMENT 2

Connecting to Supply Wiring

Overview

The final step of installation is connecting the supply wiring at the subpanel. Terminals for phase wires and neutral (if used), disconnect switch with lockout, and equipment ground bar are provided on the subpanel in the electrical components enclosure. If there are multiple circuits on the pole, a disconnect is provided for each circuit. This may be on a separate subpanel in another enclosure. Depending on foundation design and/or soil conditions, a supplemental grounding electrode may be required.

Tools/Materials Needed

Musco Supplied

- ❑ 3⁄16 in hex key (ground bar)
- ❑ 5⁄16 in hex key (bonding terminal inside handhole)
- ❑ 5⁄32 in hex key (handhole covers)
- ❑ 5 mm hex key (125 A disconnect terminals)
- ❑ Equipment bonding jumper

Contractor Supplied

- ❑ Standard screwdriver
- ❑ 3 m (10 ft) stepladder or small line truck

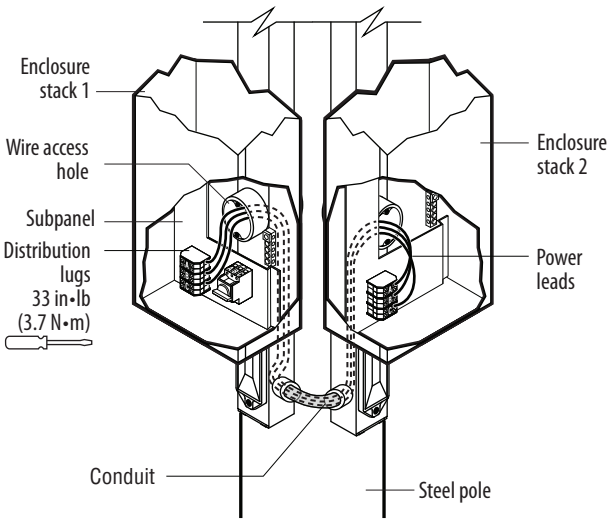
Installation Procedure

Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear.

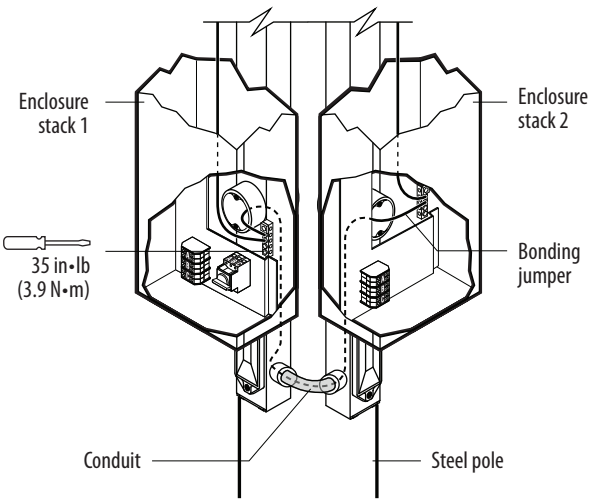
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.

1 If pole has multiple stacks on the same electrical circuit then route lower loads from second stack to distribution lugs on main subpanel.

Route all power leads for lighting equipment to appropriate subpanel locations.



2 Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one. Tighten lugs using 3⁄16 in hex key.



Connecting to Supply Wiring

3 Remove handhole cover using 5⁄32 in hex key. Rout supply wiring through access hub into electrical components enclosure.

4 Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using 3⁄16 in hex key.

Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.

5 Connect phase wires (supply) to disconnect switch. Tighten lugs using standard screwdriver (45 A disconnect) or 5 mm hex key (125 A disconnect). Connect neutral wire (if used) to distribution lug. Tighten lug using standard screwdriver.

6 Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 5⁄16 in hex key.

7 Ensure all handhole covers are installed and electrical components enclosure is closed and latched.

If your project includes a supplemental grounding electrode kit, follow instructions in kit for installing electrode.

Warning
Risk of electric shock.

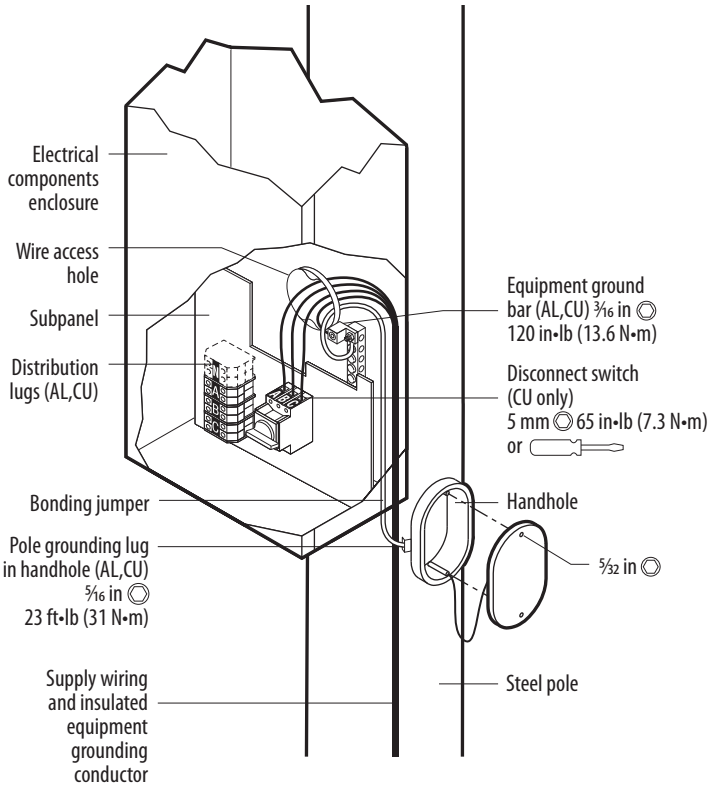
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

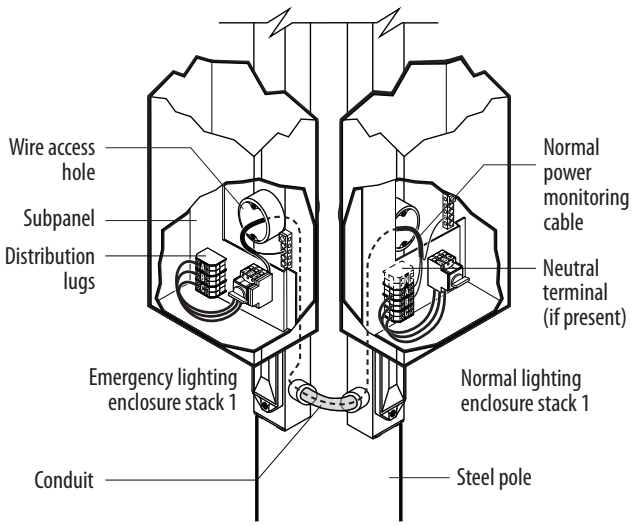
Warning
Lightning hazard.

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

Skip step 8 if no emergency egress lighting is present.

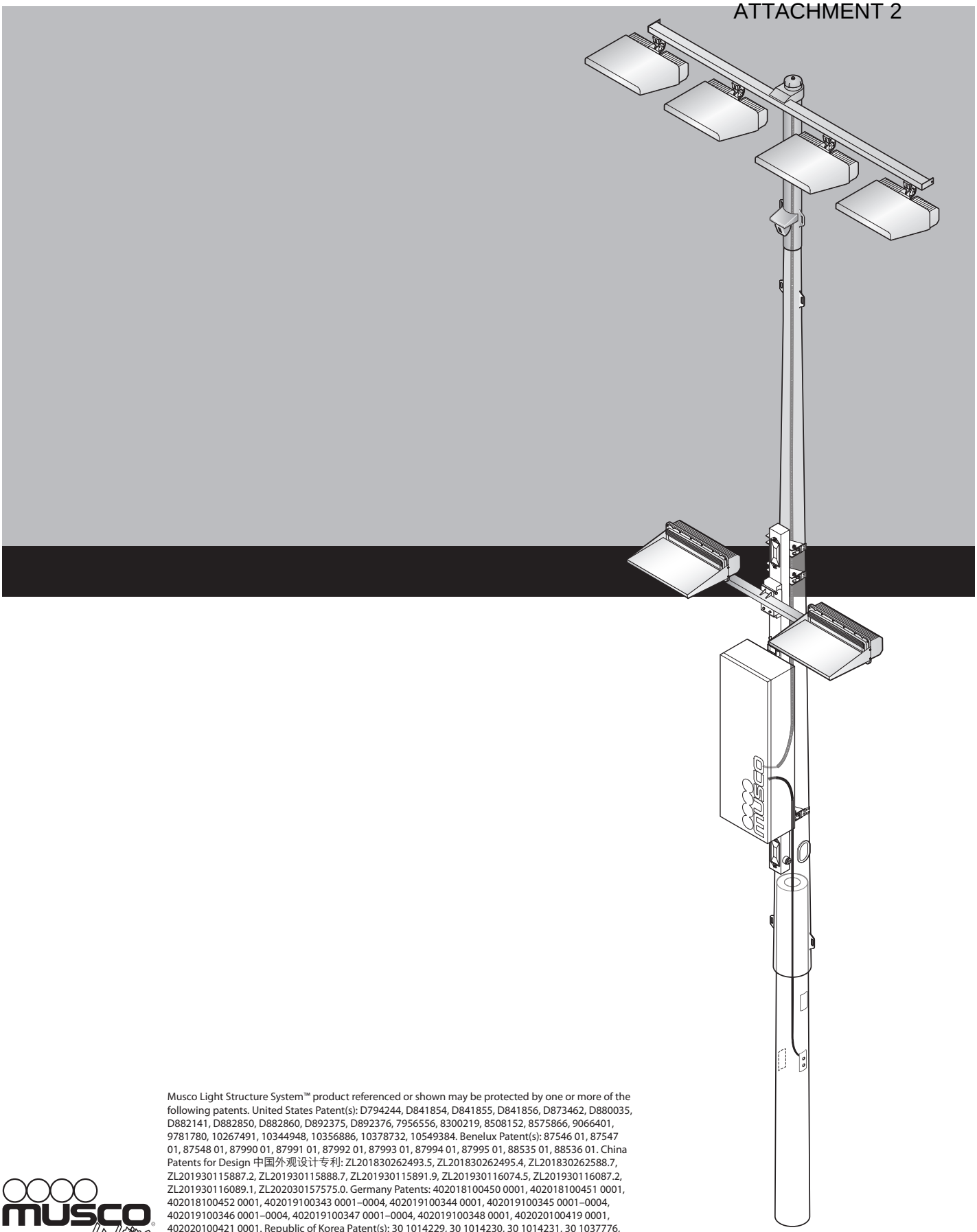
8 Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.





Notes

Notes



Musco Light Structure System™ product referenced or shown may be protected by one or more of the following patents. United States Patent(s): D794244, D841854, D841855, D841856, D873462, D880035, D882141, D882850, D882860, D892375, D892376, 7956556, 8300219, 8508152, 8575866, 9066401, 9781780, 10267491, 10344948, 10356886, 10378732, 10549384. Benelux Patent(s): 87546 01, 87547 01, 87548 01, 87990 01, 87991 01, 87992 01, 87993 01, 87994 01, 87995 01, 88535 01, 88536 01. China Patents for Design 中国外观设计专利: ZL201830262493.5, ZL201830262495.4, ZL201830262588.7, ZL201930115887.2, ZL201930115888.7, ZL201930115891.9, ZL201930116074.5, ZL201930116087.2, ZL201930116089.1, ZL202030157575.0. Germany Patents: 402018100450 0001, 402018100451 0001, 402018100452 0001, 402019100343 0001–0004, 402019100344 0001, 402019100345 0001–0004, 402019100346 0001–0004, 402019100347 0001–0004, 402019100348 0001, 402020100419 0001, 402020100421 0001. Republic of Korea Patent(s): 30 1014229, 30 1014230, 30 1014231, 30 1037776, 30 1037783 0001–0004, 30 1037788 0001–0004, 30 1037795, 30 1037796 0001–0004, 30 1037802 0001–0004, 30 1110351, 30 1110358, 30 1110362. United Arab Emirates Patent(s): 5678, 5679, 5680, 5984, 5985, 5986, 5987, 5988, 5989. United Kingdom Patent(s): 6032011, 6032022, 6032023. 6056943, 6056944, 6056945, 6056946, 6056947, 6056948, 6088584, 6088586, 6088587. U.S. and foreign patents pending. [Pat_085A]

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Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Lighting System

Pole/Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1, C1	80'	80'	3	TLC-LED-1500	4.23 kW	A
A2, C2	80'	80'	2	TLC-LED-1500	2.82 kW	A
A2, C2	80'	80'	2	TLC-LED-900	1.76 kW	A
A3, C2	80'	80'	2	TLC-LED-1500	2.82 kW	B
A3, C2	80'	80'	2	TLC-LED-900	1.76 kW	B
A4, C1	80'	80'	3	TLC-LED-1500	4.23 kW	B
B1, D1	80'	80'	4	TLC-LED-1500	5.64 kW	A
B2, D1	80'	80'	4	TLC-LED-1500	5.64 kW	B
S1, S3	80'	80'	2	TLC-LED-1200	2.34 kW	C
S1, S3	80'	80'	2	TLC-LED-900	1.76 kW	C
S2, S4	80'	80'	2	TLC-LED-1200	2.34 kW	D
S2, S4	80'	80'	2	TLC-LED-900	1.76 kW	D
S3, S5	80'	80'	2	TLC-LED-1200	2.34 kW	E
S3, S5	80'	80'	2	TLC-LED-900	1.76 kW	E
S4, S6	80'	80'	2	TLC-LED-1200	2.34 kW	F
S4, S6	80'	80'	2	TLC-LED-900	1.76 kW	F
15			**76**		**90.60 kW**	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Soccer 1	28.90 kW	22
B	Soccer 2	28.90 kW	22
C	Soccer 3 North	8.20 kW	8
D	Soccer 3 South	8.20 kW	8
E	Soccer 4 North	8.20 kW	8
F	Soccer 4 South	8.20 kW	8

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-1200	LED 5700K - 75 CRI	1170W	150,000	>120,000	>120,000	>120,000	16
TLC-LED-1500	LED 5700K - 75 CRI	1410W	181,000	>120,000	>120,000	>120,000	36
TLC-LED-900	LED 5700K - 75 CRI	880W	104,000	>120,000	>120,000	>120,000	24

Single Luminaire Amperage Draw Chart

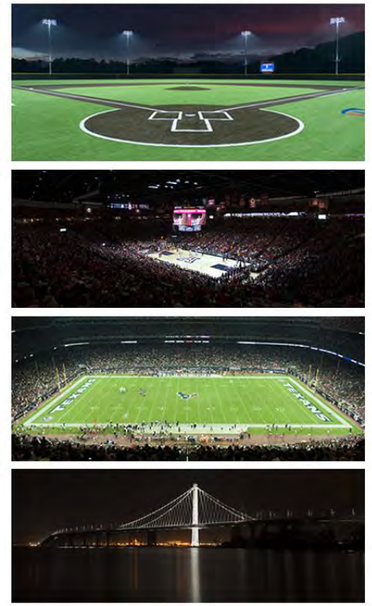
Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Soccer 1	Horizontal Illuminance	32.8	26	42	1.63	1.26	A	22
Soccer 2	Horizontal Illuminance	32.8	26	45	1.76	1.26	B	22
Soccer 3	Horizontal Illuminance	30.1	23	39	1.70	1.31	C,D	16
Soccer 4	Horizontal Illuminance	30.1	23	38	1.66	1.31	E,F	16
Spill @ Fence	Horizontal	0.04	0	0.20	0.00		A,B,C,D,E,F	76
Spill @ Fence	Max Vertical Illuminance Metric	0.06	0	0.27	0.00		A,B,C,D,E,F	76

From Hometown to Professional



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ATTACHMENT 2

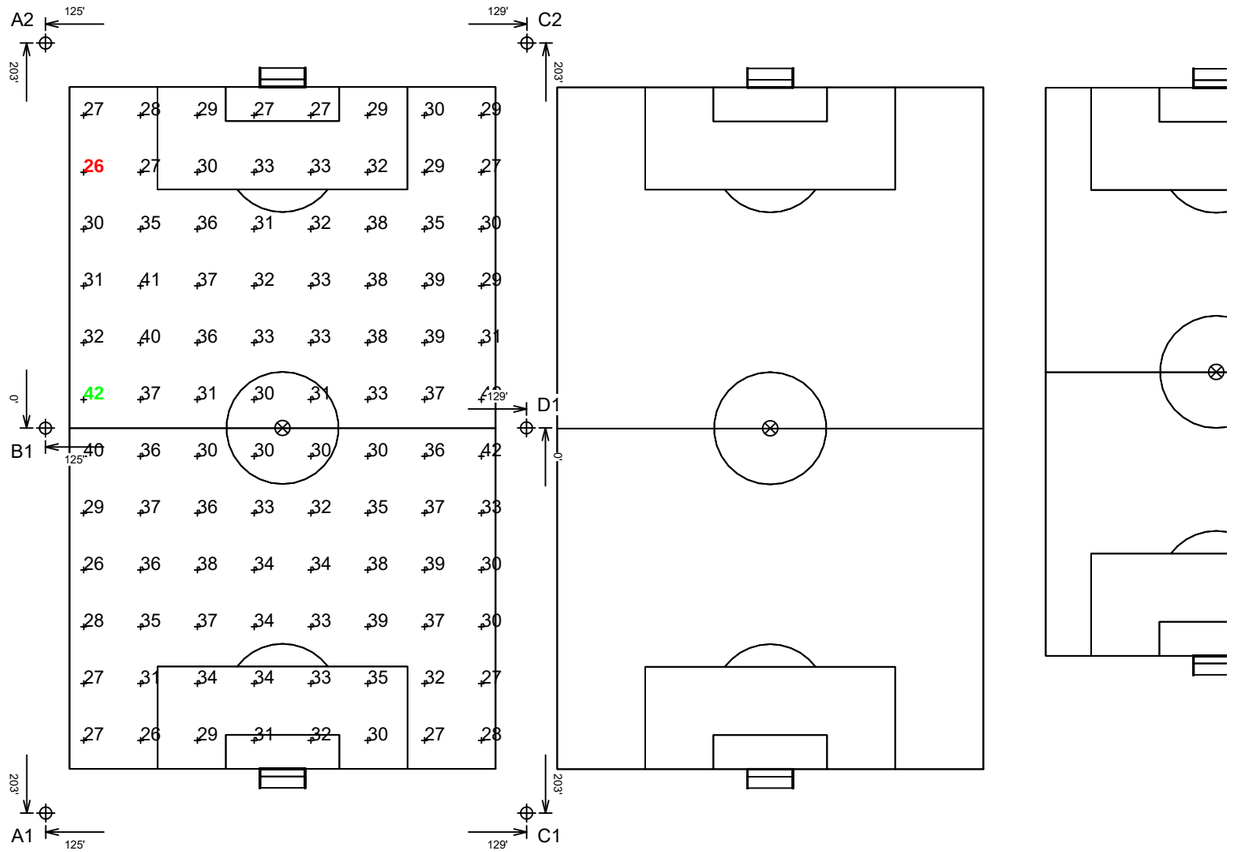
Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A1	80'	-	80'	TLC-LED-1500	3	3	0
1	A2	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
1	B1	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	3	3
1	C2	80'	-	80'	TLC-LED-1500	4	2	2
				80'	TLC-LED-900	4	2	2
1	D1	80'	-	80'	TLC-LED-1500	4/4*	4	4
6	Totals					33	22	11

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



Grid Summary

Name	**Soccer 1**
Size	360' x 225'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Guaranteed Average	**30**
Scan Average	32.8
Maximum	42
Minimum	26
Avg/Min	1.28
Guaranteed Max/Min	**2.5**
Max/Min	1.63
UG (adjacent pts)	1.38
CU	0.76
No. of Points	96
LUMINAIRE INFORMATION	
Applied Circuits	A
No. of Luminaires	**22**
Total Load	28.90 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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ATTACHMENT 2

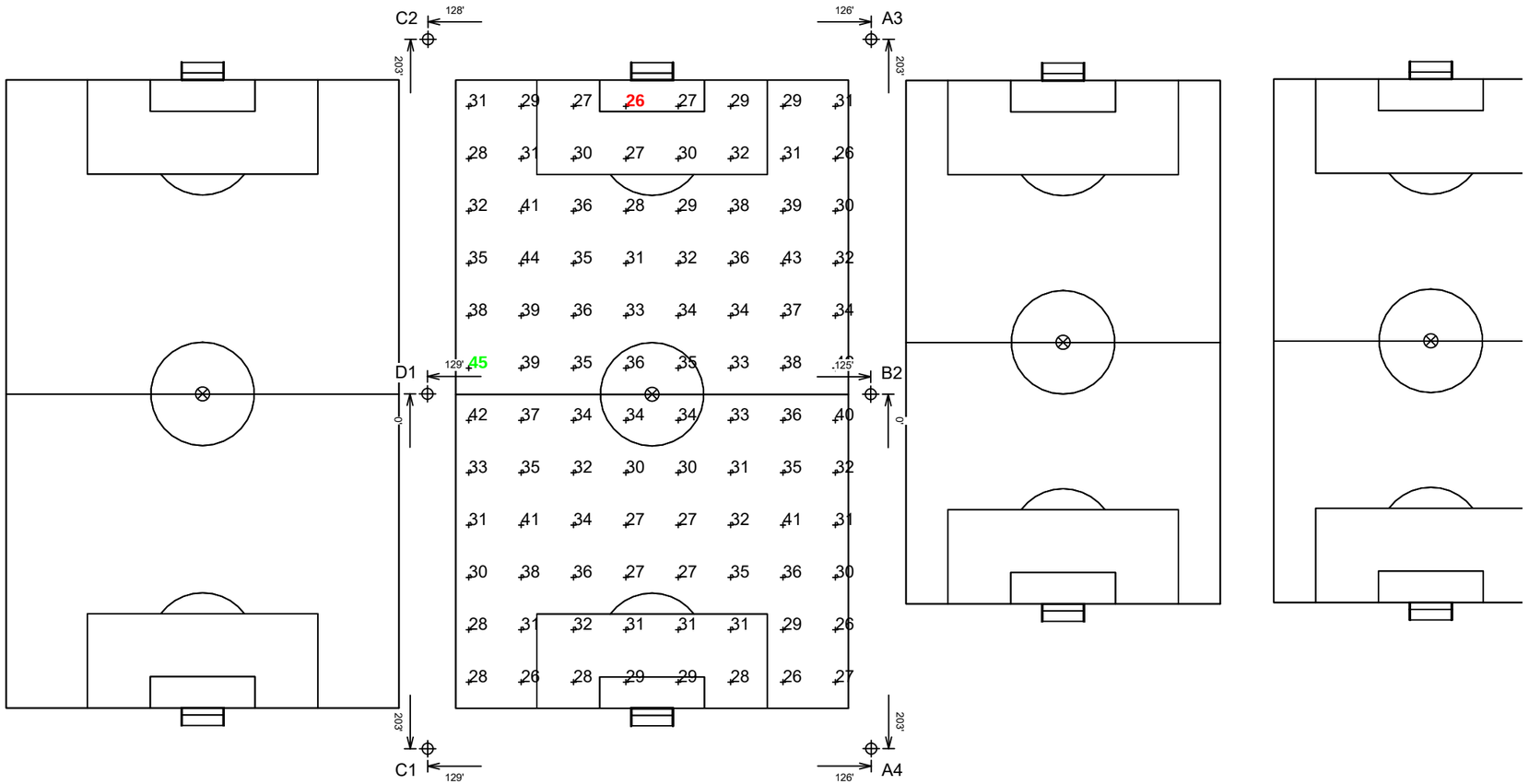
Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
1	A4	80'	-	80'	TLC-LED-1500	3	3	0
1	B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	3	3
1	C2	80'	-	80'	TLC-LED-1500	4	2	2
				80'	TLC-LED-900	4	2	2
1	D1	80'	-	80'	TLC-LED-1500	4/4*	4	4
6	Totals					33	22	11

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



Grid Summary

Name	**Soccer 2**
Size	360' x 225'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Guaranteed Average	**30**
Scan Average	32.8
Maximum	45
Minimum	26
Avg/Min	1.28
Guaranteed Max/Min	**2.5**
Max/Min	1.76
UG (adjacent pts)	1.36
CU	0.76
No. of Points	96
LUMINAIRE INFORMATION	
Applied Circuits	B
No. of Luminaires	**22**
Total Load	28.90 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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ATTACHMENT 2

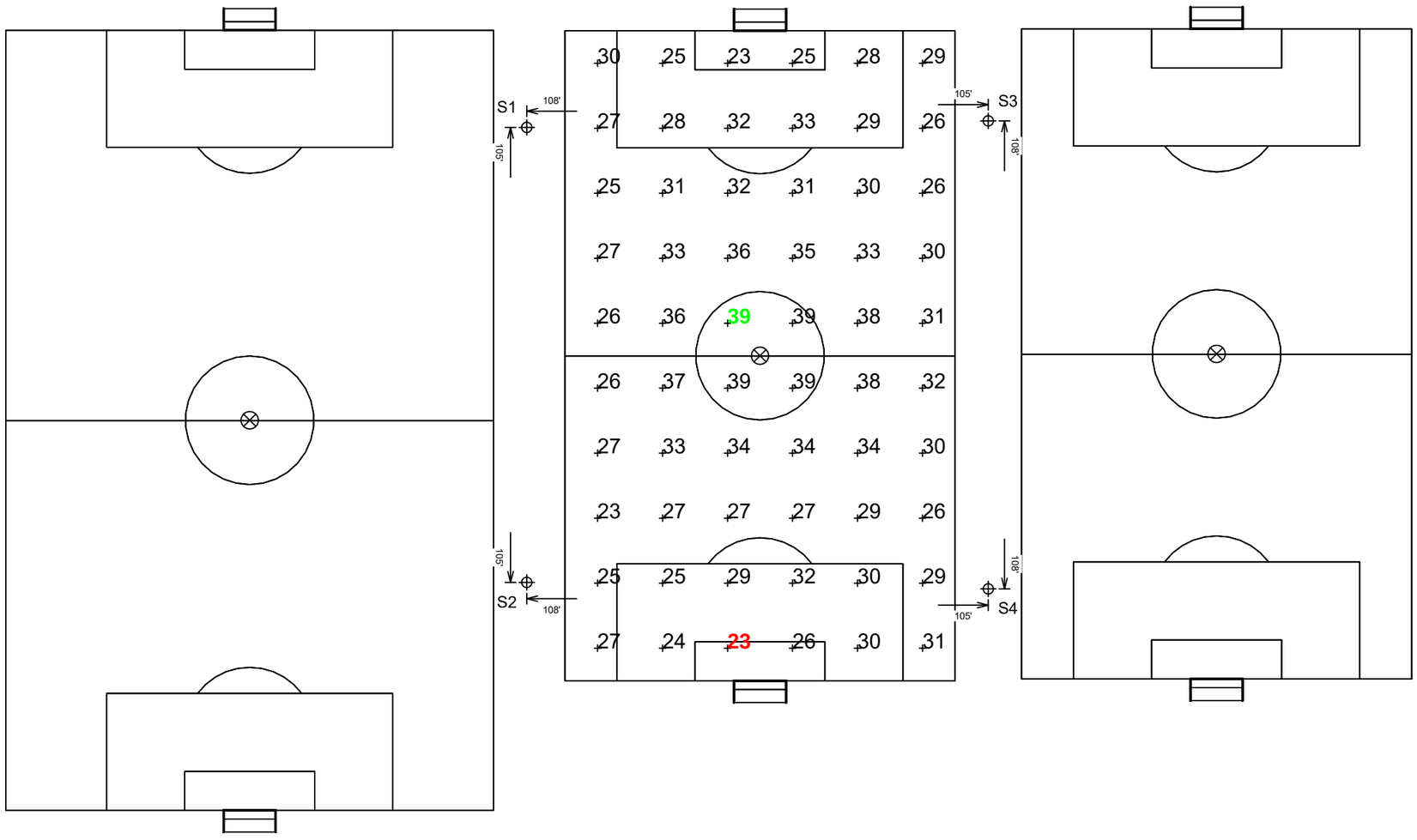
Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	S1-S2	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	2	2
				80'	TLC-LED-900	2/2*	2	2
4	Totals					24	16	8

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



SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Grid Summary

Name	**Soccer 3**
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Guaranteed Average	**30**
Scan Average	30.1
Maximum	39
Minimum	23
Avg/Min	1.30
Guaranteed Max/Min	**2.5**
Max/Min	1.70
UG (adjacent pts)	1.39
CU	0.79
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	C,D
No. of Luminaires	**16**
Total Load	16.40 kW

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 RP-6-15.

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

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

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ATTACHMENT 2

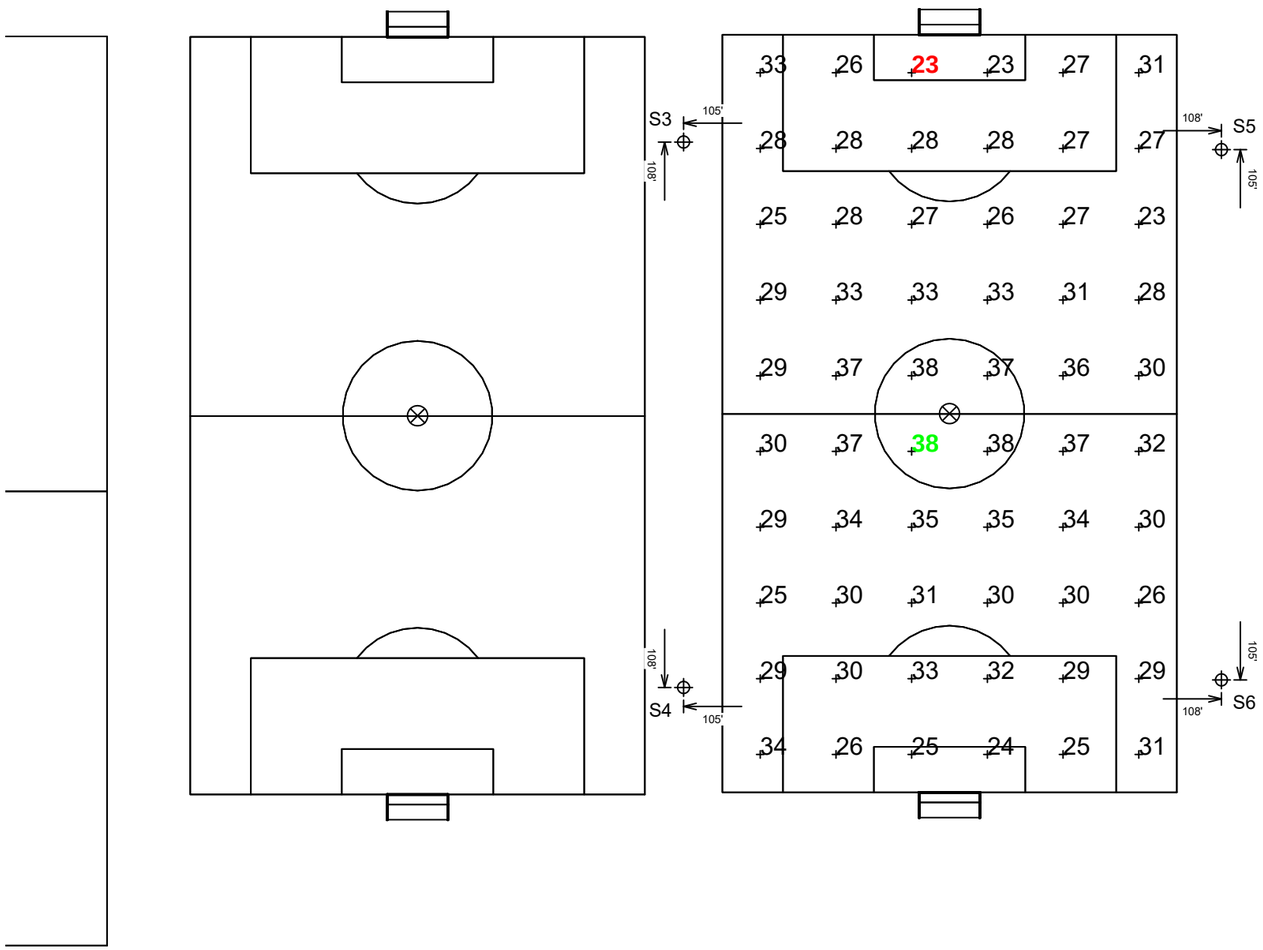
Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	2	2
				80'	TLC-LED-900	2/2*	2	2
2	S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
4	Totals					24	16	8

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



SCALE IN FEET 1 : 60

0' 60' 120'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Grid Summary

Name	**Soccer 4**
Size	300' x 180'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Guaranteed Average	**30**
Scan Average	30.1
Maximum	38
Minimum	23
Avg/Min	1.30
Guaranteed Max/Min	**2.5**
Max/Min	1.66
UG (adjacent pts)	1.35
CU	0.79
No. of Points	60
LUMINAIRE INFORMATION	
Applied Circuits	E,F
No. of Luminaires	**16**
Total Load	16.40 kW

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 RP-6-15.

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

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

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ATTACHMENT 2

Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	A1, A4	80'	-	80'	TLC-LED-1500	3	3	0
2	A2-A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
2	B1-B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	6	0
1	C2	80'	-	80'	TLC-LED-1500	4	4	0
				80'	TLC-LED-900	4	4	0
1	D1	80'	-	80'	TLC-LED-1500	4/4*	8	0
4	S1-S2, S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	4	0
				80'	TLC-LED-900	2/2*	4	0
15	Totals					76	76	0

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

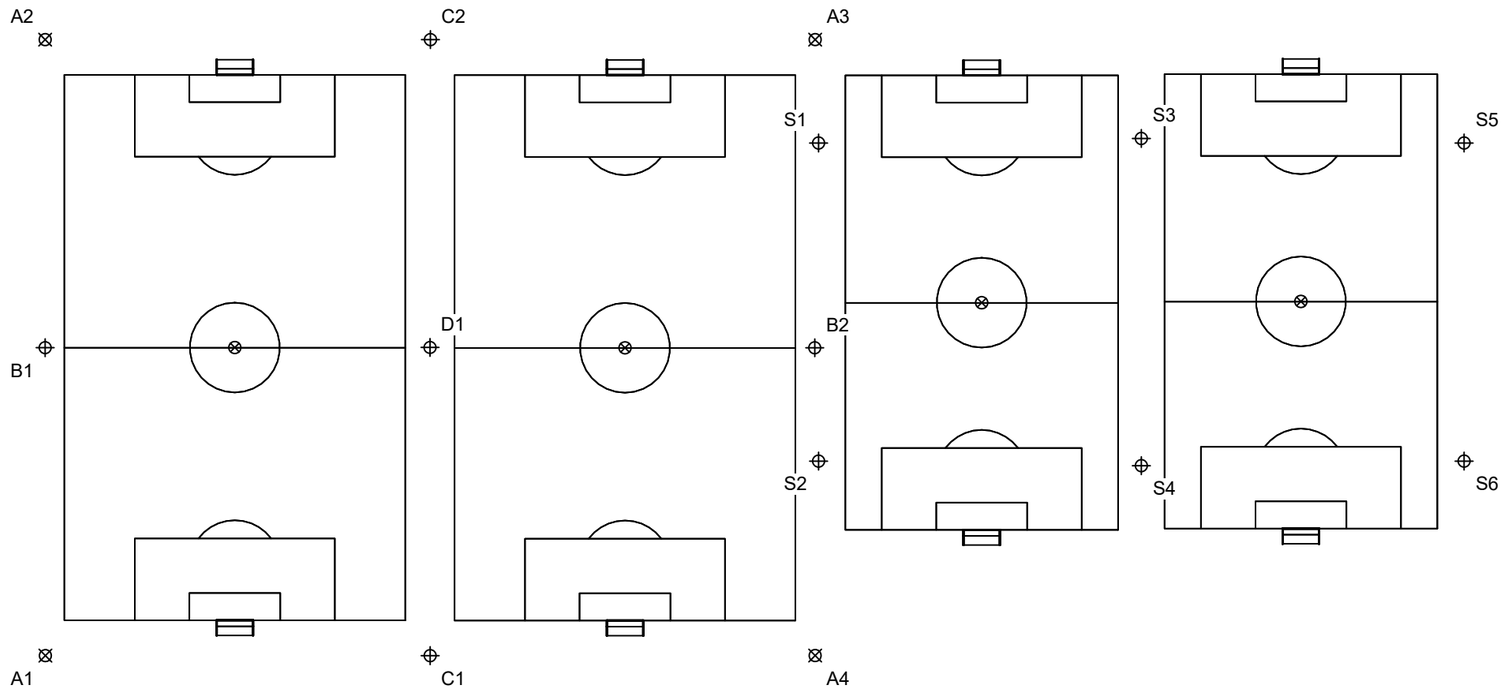
Grid Summary

Name	**Spill @ Fence**
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Scan Average	**0.039**
Maximum	0.20
Minimum	0.00
CU	0.00
No. of Points	75
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D,E,F
No. of Luminaires	**76**
Total Load	90.60 kW

0.00 0.00 0.00 0.01 0.03 0.13 0.11 0.10 0.10 0.12 0.14 0.15 0.03 0.19 0.18 0.17 0.16 0.17 0.19 0.20 0.12 0.01 0.02 0.05 0.06 0.05 0.03 0.03 0.04 0.04 0.05 0.07 0.06 0.04 0.02 0.01 0.00 0.00 0.00 0.00



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 RP-6-15.

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

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

SCALE IN FEET 1 : 100

0' 100' 200'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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ATTACHMENT 2

Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
2	A1, A4	80'	-	80'	TLC-LED-1500	3	3	0
2	A2-A3	80'	-	80'	TLC-LED-1500	2	2	0
				80'	TLC-LED-900	2	2	0
2	B1-B2	80'	-	80'	TLC-LED-1500	4	4	0
1	C1	80'	-	80'	TLC-LED-1500	6	6	0
1	C2	80'	-	80'	TLC-LED-1500	4	4	0
				80'	TLC-LED-900	4	4	0
1	D1	80'	-	80'	TLC-LED-1500	4/4*	8	0
4	S1-S2, S5-S6	80'	-	80'	TLC-LED-1200	2	2	0
				80'	TLC-LED-900	2	2	0
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	4	0
				80'	TLC-LED-900	2/2*	4	0
15	Totals					76	76	0

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

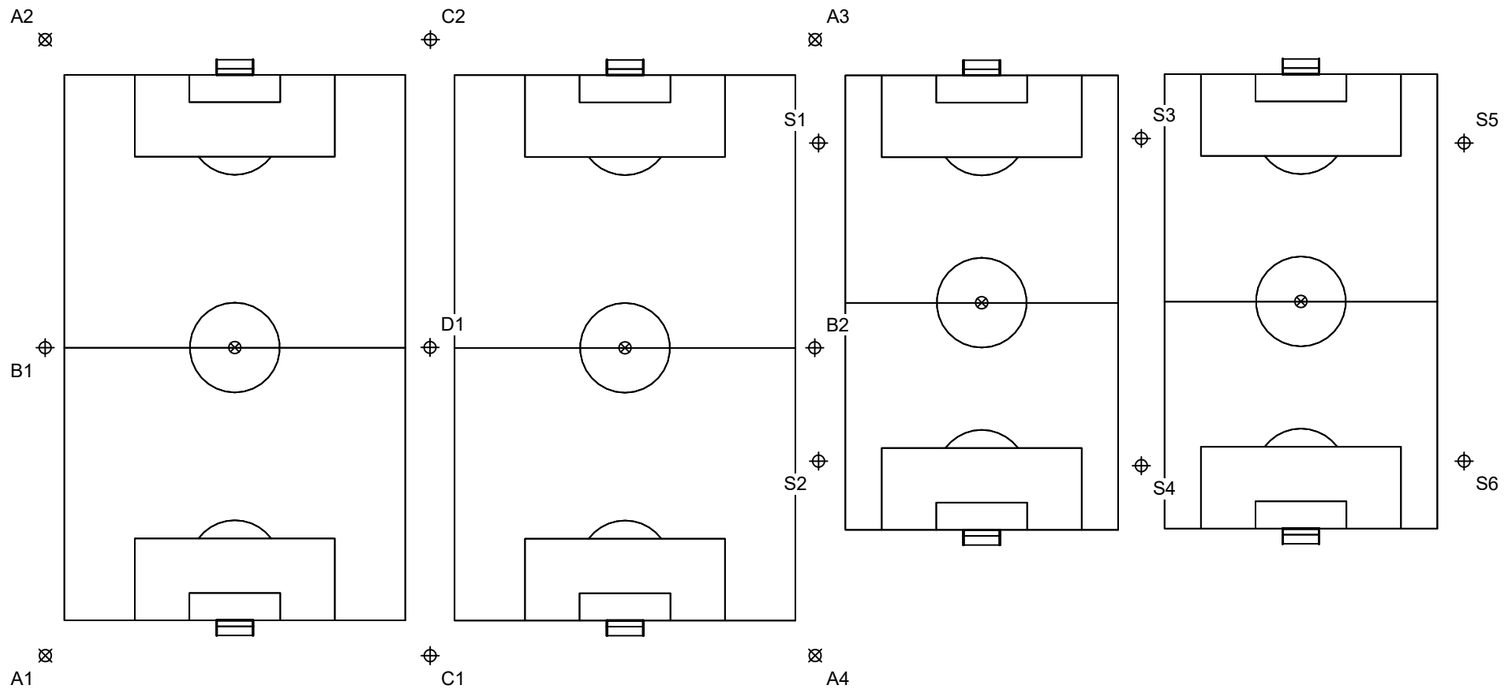
Grid Summary

Name	**Spill @ Fence**
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED MAX VERTICAL FOOTCANDLES
	Entire Grid
Scan Average	**0.059**
Maximum	0.27
Minimum	0.00
CU	0.00
No. of Points	75
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D,E,F
No. of Luminaires	**76**
Total Load	90.60 kW

0.00 0.01 0.01 0.02 0.05 0.18 0.15 0.12 0.13 0.18 0.21 0.23 0.06 0.26 0.24 0.24 0.20 0.21 0.25 0.27 0.17 0.03 0.05 0.09 0.12 0.11 0.08 0.06 0.08 0.09 0.11 0.12 0.11 0.09 0.06 0.02 0.01 0.00 0.00 0.00



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 RP-6-15.

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

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

SCALE IN FEET 1 : 100

0' 100' 200'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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ATTACHMENT 2

Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment Layout

INCLUDES:
· Soccer 1
· Soccer 2
· Soccer 3
· Soccer 4

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

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

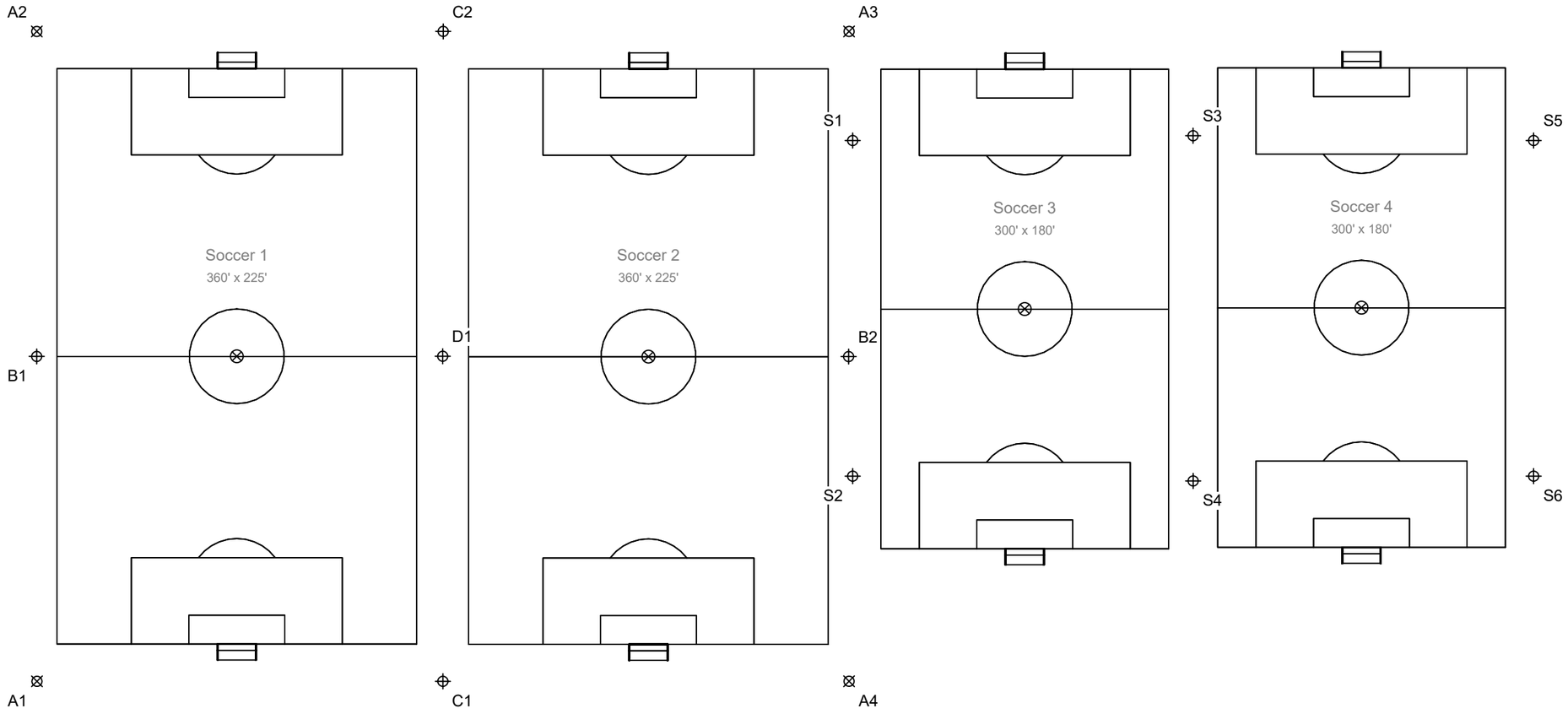
Equipment List For Areas Shown

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE
2	A1, A4	80'	-	80'	TLC-LED-1500	3
2	A2-A3	80'	-	80'	TLC-LED-1500	2
				80'	TLC-LED-900	2
2	B1-B2	80'	-	80'	TLC-LED-1500	4
1	C1	80'	-	80'	TLC-LED-1500	6
1	C2	80'	-	80'	TLC-LED-1500	4
				80'	TLC-LED-900	4
1	D1	80'	-	80'	TLC-LED-1500	4/4*
4	S1-S2, S5-S6	80'	-	80'	TLC-LED-1200	2
				80'	TLC-LED-900	2
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*
				80'	TLC-LED-900	2/2*
15	Totals					76

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

Single Luminaire Amperage Draw Chart

Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3



SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Project Information

Control System

Control System ID:	1 of 1
Control System Type:	Control-Link® Control and Monitoring System
Communication Type:	PowerLine-ST

Power Requirements

Control cabinet(s):	
Control voltage (phase to neutral)	120/60
VA loading - Inrush	5718.0
VA loading - Sealed	622.0
Lighting Circuits:	
Voltage/Hertz/Phase	480/60/3

Project Notes:

Equipment Listing

Description	Qty	Size (in)
Control and monitoring cabinet - primary	1	24 X 72
Control and monitoring cabinet - secondary	1	24 X 72

Preliminary Plans: Confirm all details - see Note 1

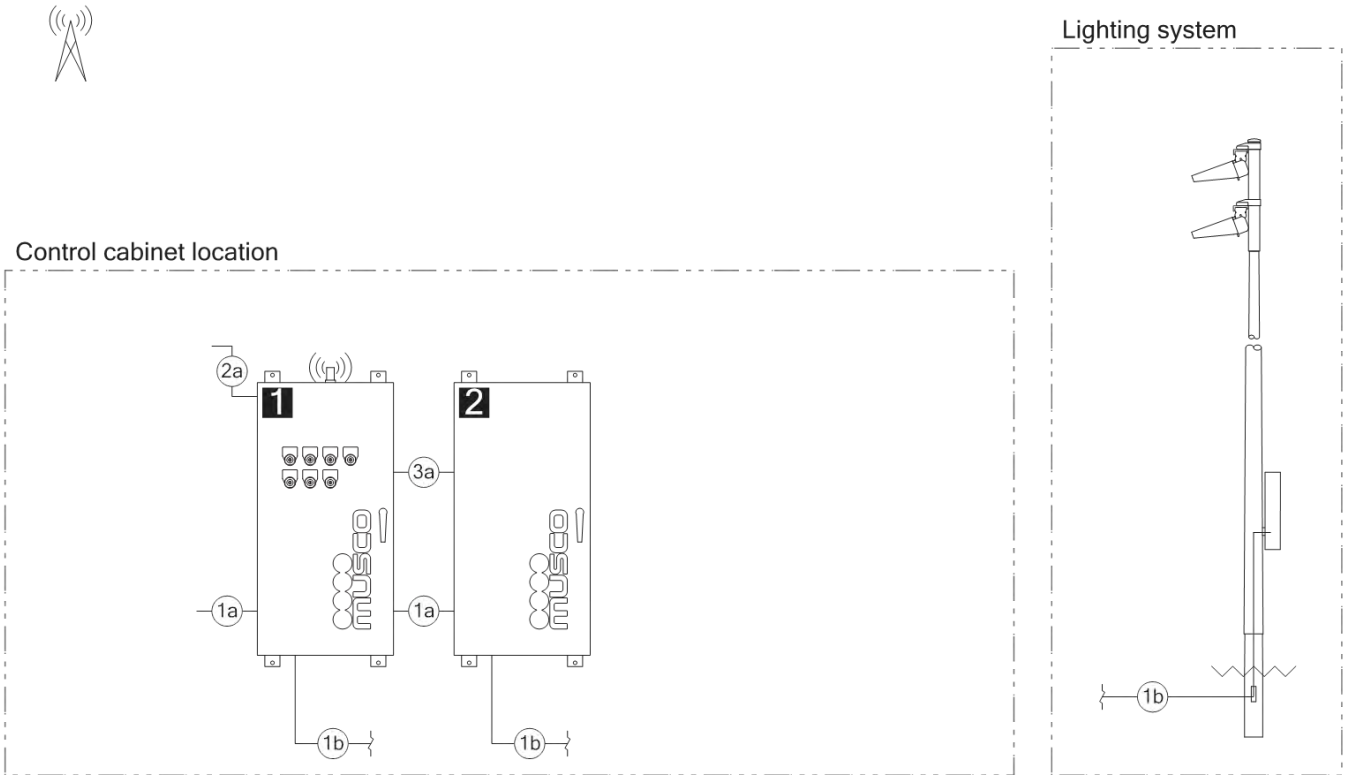
Important Notes:

1. Please confirm that the lighting circuit voltage listed above is accurate for this facility. This is the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole location. Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each circuit at each pole location. Contactors are 3 pole and 100% rated for the published continuous load.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. Size overcurrent devices using the full load amps column of the Circuit Summary by Switch chart (Minimum power factor is 0.9). Size conduit per code unless otherwise specified as larger to allow for harness connectors.
6. Avoid use of in-ground junction/pull boxes when possible. If used, all wire connectors must be UL listed for Wet Locations to prevent leakage current.
7. Control power wiring must be in separate conduit from line or load power wiring. Communication cables must be in separate conduit from any power wiring.
8. Refer to Installation Instructions for more details on equipment information and the installation requirements.

System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Equipment Layout and Connection Details



Connection Details

ID	Description
1a	Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1b	Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
2a	Control power with equipment ground to control cabinet. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
3a	Control harnesses - Secondary cabinet to primary cabinet. Harness is provided by Musco in 8-foot length. Use minimum 2 inch diameter conduit for harness connector.

Equipment

ID	Description
1	Control and monitoring cabinet - primary
2	Control and monitoring cabinet - secondary

System Requirements: Control System Summary

Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349
Control System ID: 1 of 1
Distribution Panel Location/ID: Soccer

Circuit Summary

Switching Schedule	
Field/Switch Description	**Switches**
Soccer 1	**1**
Soccer 2	**2**
Soccer 3	**3,4**
N Soccer 3	3
S Soccer 3	4
Soccer 4	**5,6**
N Soccer 4	5
S Soccer 4	6
Security Lighting	**7**

Control Module ID: 1

Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
1	Soccer 1	A1	3	6.29	30	1	C1
	Soccer 1	A2	4	8.24	30	1	C2
	Soccer 1	B1	4	9.43	30	1	C3
	Soccer 1	C1	3	6.29	30	1	C4
	Soccer 1	C2	4	8.24	30	1	C5
	Soccer 1	D1	4	9.43	30	1	C6
2	Soccer 2	A3	4	8.24	30	1	C7
	Soccer 2	A4	3	6.29	30	1	C8
	Soccer 2	B2	4	9.43	30	1	C9
	Soccer 2	C1	3	6.29	30	1	C10
	Soccer 2	C2	4	8.24	30	1	C11
	Soccer 2	D1	4	9.43	30	1	C12
3	N Soccer 3	S1	4	7.15	30	2	C13
	N Soccer 3	S3	4	7.15	30	2	C14
4	S Soccer 3	S2	4	7.15	30	2	C15
	S Soccer 3	S4	4	7.15	30	2	C16
5	N Soccer 4	S3	4	7.15	30	2	C17
	N Soccer 4	S5	4	7.15	30	2	C18
6	S Soccer 4	S4	4	7.15	30	2	C19
	S Soccer 4	S6	4	7.15	30	2	C20
7	Security Lighting	P1	0	0	30	2	C21

LIGHTING SPECIFICATION
PREPARED FOR

Tewinkle Park Tennis

LED Lighting Project
Costa Mesa, CA
September 14, 2023

Project # 215837

SUBMITTED BY:

Musco Sports Lighting, LLC

2107 Stewart Road
PO Box 260
Muscatine, Iowa 52761
Local Phone: 563/263-2281
Toll Free: 800/756-1205
Fax: 800/374-6402

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SECTION 26 56 68 – EXTERIOR ATHLETIC LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

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 these specifications is to define the lighting system performance and design standards for Tewinkle Park Tennis 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 venues:

1. Tennis 1-2
2. Tennis 3-4
3. Tennis 5-6
4. Tennis 7-8
5. Tennis 9-10
6. Tennis 11-12

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 to not drop below specified target values for a period of 25 years.
2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.
3. Cost of Ownership: 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 for the duration of the warranty.
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. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

1.2 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Tennis 1-2	30 fc	2.5:1	30	20’ x 20’
Tennis 3-4	30 fc	2.5:1	30	20’ x 20’
Tennis 5-6	30 fc	2.5:1	30	20’ x 20’
Tennis 6-7	30 fc	2.5:1	30	20’ x 20’
Tennis 7-8	30 fc	2.5:1	30	20’ x 20’
Tennis 9-10	30 fc	2.5:1	30	20’ x 20’
Tennis 11-12	30 fc	2.5:1	30	20’ x 20’

B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
14	T1- T14	50’

1.3 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

C. Glare Control: Maximum candela values at a distance of 150 feet and a height of 3 feet are defined for typical sports fields below.

Typical Field Type	Maximum Candela at 150 feet
Baseball	<40,000 candela
Softball	<30,000 candela
Football	<24,000 candela
Soccer	<12,000 candela
Tennis	<12,000 candela

D. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.

E. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer’s laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

1.4 Cost of Ownership

A. Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly. Alternate: Concrete pole with a minimum of 8,000 psi and installed with concrete backfill will be an acceptable alternative provided building code, wind speed and foundation designs per specifications are adhered to.
2. Non-approved pole technology:
    a. Square static cast concrete poles will not be accepted.
    b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
3. Lighting systems shall use concrete foundations. See Section 2.4 for details.
    a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
4. Manufacturer will supply all drivers and supporting electrical equipment
    a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
    b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
8. Contactor cabinet to provide on-off control.

9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
    a. Integrated grounding via concrete encased electrode grounding system.
    b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.
10. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following enhanced requirements in addition to the standard durability protection specified above:
    a) Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.
    b) Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.
    c) Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:
    1. Electric power: 240V Volt, 1 Phase
    2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The kW consumption for the field lighting system shall be 26.62 kW.

2.3 CONTROL

A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

C. 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. Scheduling tool shall be capable of setting curfew limits.

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.

D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

E. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status

of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

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. Report hours saved by using early off and push buttons by users.

F. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.

G. Communication with luminaire drivers: Control system shall interface with drivers in electrical components enclosures by means of powerline communication.

2.4 STRUCTURAL PARAMETERS

(Use for 2019 CBC)

A. Wind Loads: Wind loads shall be based on the 2019 California Building Code. Wind loads to be calculated using ASCE 7-16, a design wind speed of 95mi/h, 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. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2016 CBC Table 1806.2.

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. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of CA for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12weeks from receipt of approved submittals and receipt of complete order information.

3.3 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. Field Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an

additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.

3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.

B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.0 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.0.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.

B. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.

D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. ***Submit checklist below with submittal.***

Yes/ No	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 b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, 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 foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed 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.
	F	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 to not fall below target levels for warranty period.
	G	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 CA, if required by owner.
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system. They will also provide ten (10) references of customers currently using proposed system in the state of CA.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product 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 CA.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of CA.
	K	Project References	Manufacturer to provide a list of five (5) projects where the technology and specific fixture proposed for this project has been installed in the state of CA. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.
	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.

	N	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 Tewinkle Park Tennis. 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:** _____/_____/_____

Contractor: _____ **Signature:** _____

Tewinkle Park Tennis
Costa Mesa, CA
Light Structure System Scope of Work

Customer Responsibilities:

1. Complete access to the site for construction using standard 2-wheel drive rubber tire equipment.
2. Locate existing underground utilities not covered by your local utilities. (i.e. water lines, electrical lines, irrigation systems, and sprinkler heads). Musco or Subcontractor will not be responsible for repairs to unmarked utilities.
3. Locate and mark field reference points per Musco supplied layout. (i.e. home plate, center of FB field).
4. If existing underground wiring is being used ensure usability.
5. Pay any necessary power company fees and requirements.
6. Pay all permitting fees.
7. Provide any existing as-built documents or drawings.
8. Provide sealed Electrical Plans. (If required)

Musco Responsibilities:

1. Provide required fixtures, electrical enclosures, mounts, hardware, wire harnesses, and control cabinets.
2. Provide poletop luminaire assembly on 14 poles
3. Provide fixture layout and aiming diagram.
4. Assist our installing subcontractor and ensure our responsibilities are satisfied.

Contractor Responsibilities

General:

1. Obtain any required permitting.
2. Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner and Musco regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect Musco delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
9. Provide startup and aiming as required to provide complete and operating sports lighting system.
10. Installation to commence upon delivery and proceed without interruption until complete. Musco to be immediately notified of any breaks in schedule or delays.
11. Provide labor, materials, and equipment to assemble and install Musco TLC for LED® equipment on new Musco poles.

CODE OF CONDUCT

In order to maintain a high-quality jobsite and installation, Subcontractor represents to Musco that it has the supervision necessary to, and shall train, manage, supervise, monitor, and inspect the activities of its employees for the purpose of enforcing compliance with these safety requirements. Subcontractor acknowledges that Musco does not undertake any duty toward Subcontractor's employees to train, manage, supervise, monitor, and inspect their work activities for the purpose of enforcing compliance with these safety requirements, but Subcontractor agrees to abide by any reasonable recommendations made by Musco or Musco representatives with respect to safety.

Subcontractor agrees that it is or will be familiar with and shall abide by the safety rules and regulations of Musco and the Owner, including, but not limited to the Occupational Safety and Health Act of 1970 (OSHA), all rules and regulations established pursuant thereto, and all amendments and supplements thereto.

Subcontractor further agrees to require all its employees, subcontractors, and suppliers to comply with these requirements. Subcontractor shall also observe and comply with all laws with respect to environmental protection applicable to the Project.

Subcontractor shall require all its subcontractors, employees, visitors, suppliers, and agents under its direction to comply with the following:

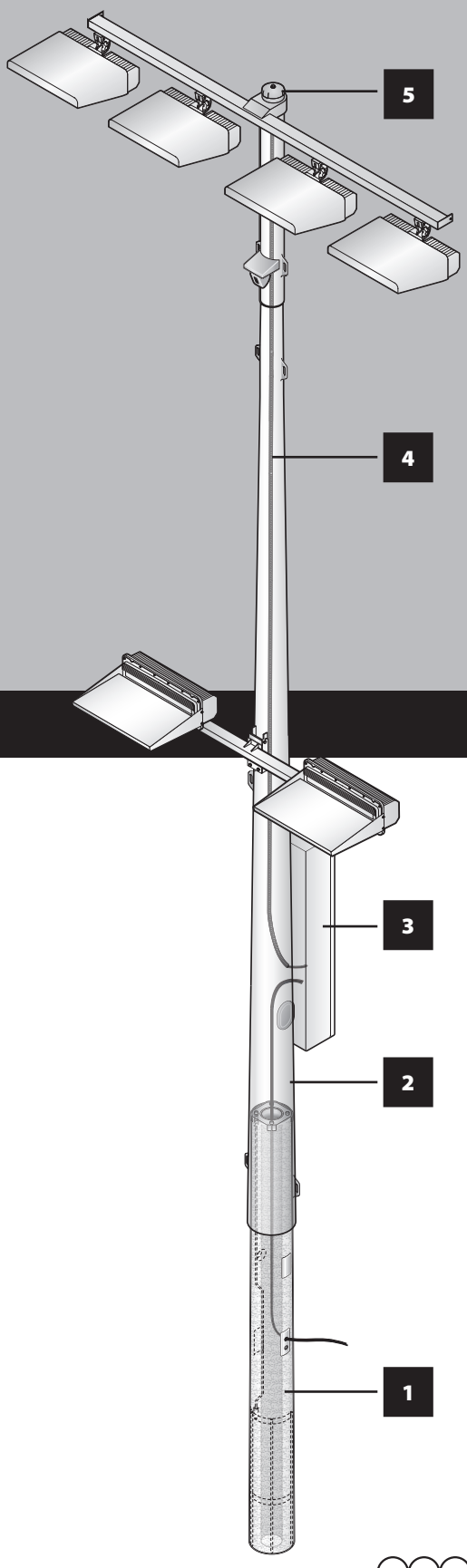
1. GENERAL JOBSITE SAFETY AND CLEANLINESS.
   a. Subcontractor's employees and agents shall be required to wear appropriate personal protective equipment including, but not limited to, safety glasses with side shields, work shoes, fall protection devices, and hard hats.
   b. Where a walking or working surface has an unprotected side or edge which is six feet or more above a lower level, Subcontractor shall use guardrail systems, safety net systems, or personal fall arrest systems.
   c. Jobsite shall be kept free of debris including, but not limited to, cardboard and packing materials which can become windborne.
   d. Construction equipment shall be parked during non-use in an orderly fashion so as not to create inconvenience to others using the jobsite.
   e. Subcontractor shall provide for and ensure the use of safety equipment for the Project in accordance with Musco's and Owner's safety requirements, to the extent these may be stricter than federal, state, or local standards, or generally recognized industry applicable standards.
   f. Subcontractor shall provide the Musco project manager with an "Emergency List" showing Subcontractor's designated medical doctor, hospital, insurance company, and any other health service providers, such list to be updated within 24 hours of any change in the information provided.
   g. Within eight (8) hours from the time of an accident (or such shorter period as laws may require), Subcontractor shall advise Musco of any accident resulting in injury to any person or damage to any equipment or facility. Upon request, Subcontractor shall promptly furnish Musco with a written report of any such accident as well as a copy of all insurance and worker's compensation claims involving the Project.
   h. Subcontractor shall maintain and inspect all construction equipment, including cranes and other lifting equipment, prior to each use. Subcontractor warrants that all equipment operators shall be qualified for each piece of construction equipment they intend to operate. Documentation of specific training is the responsibility of the Subcontractor.
   i. Jobsite shall be policed daily for compliance to the above conditions.

j. Subcontractor's employees and agents are prohibited from using drugs and alcohol on the Project property or being under the influence of alcohol or drugs while performing work on the Project. Anyone observed participating in or observed under the influence will be removed from the Project immediately and prohibited from returning, with no exceptions.

2. CONFORMANCE TO STANDARD MUSCO INSTALLATION GUIDELINES.
   a. Review and understand installation instructions are provided with every product installation.
   b. Education of installation personnel to allow for highest efficiency and lowest possibility of failure.
   c. Verify that components have been assembled per Musco installation instructions.
   d. Verify plumb of concrete foundations prior to standing of poles.

3. PROVIDING A QUALITY INSTALLATION TEAM.
   a. Subcontractor's work directly reflects the quality of the installation and may indirectly relate to the quality of the product upon which Musco's reputation is built.
   b. Provide and maintain quality installation equipment. Records of maintenance and/or calibration shall be provided upon request.
   c. Personnel shall be knowledgeable in operation of equipment as well as installation of Musco product.
   d. All personnel provided by Subcontractor shall understand the relationship developed by and between Subcontractor and Musco, also by and between Musco and the customer, and act accordingly.

Diode Light Source—LED



Installation Instructions: **Light-Structure System™**

Fast, trouble-free installation with
5 Easy Pieces™ approach to system design

5 **Poletop Luminaire Assembly**

4 **Wire Harness**

3 **Electrical Components Enclosure**

2 **Galvanized Steel Pole**

1 **Precast Concrete Base**

musco Lighting
We Make It Happen.

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Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear the appropriate personal protective equipment including:

- Hard hat
- Steel-toed shoes
- Leather work gloves
- Eye protection

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

The luminaires should be positioned so that prolonged staring into the luminaire at a distance closer than 12–37 m (40–121 ft) is not expected, per IEC/TR 62778. See table.

Luminaire	Minimum Distance
TLC-LED-350	29 m (95 ft)
TLC-LED-400	24 m (79 ft)
TLC-LED-550	29 m (95 ft)
TLC-LED-550NR	29 m (95 ft)
TLC-BT-575	12 m (38 ft)
TLC-LED-600	24 m (79 ft)
TLC-LED-900	24 m (79 ft)
TLC-LED-900NB	no minimum
TLC-LED-1150	12 m (40 ft)
TLC-LED-1200	37 m (121 ft)
TLC-LED-1400NB	38 m (124 ft)
TLC-LED-1500	37 m (121 ft)
TLC-RGBW	15 m (49 ft)
TLC-RGB-U	12 m (38 ft)
TLC-BT-1500	37 m (121 ft)

Install luminaires outside arm's reach of unauthorized personnel.

About These Instructions

These instructions give basic assembly procedures for the Light-Structure System. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative.

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Before You Begin

Throughout this manual note these important symbols:

The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.

The stop and check symbol signals you to stop and verify conditions before proceeding.

The contact Musco symbol appears in special situations where you may need to contact Musco for further information.

The go-to arrow indicates a branch in a procedure for special situations. In the case of optional equipment, the instructions may be in another document.

The tip symbol points out advice that makes installation easier.

The recycle symbol identifies recyclable materials.

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Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

Contractor/installer supplied tools	Function	Page
Hammer, pry-bar, banding cutters	Unloading equipment	9
Water pump	Removing water from base holes (as needed)	11
Two 1½ ton chain-type come-alongs	Jacking pole sections together	13, 32
Large Phillips-head screwdriver	Tightening captive screws to seal enclosure to pole hub	19
Standard screwdriver	Tightening distribution lugs, 45 A disconnect switch	33, 34
Torque wrench with ⅜, 7⁄16 and 9⁄16 in sockets	Tightening luminaire retaining cable and spreader bar hardware	17, 27
Electrical fish tape, electrician's tape	Feeding wire harness through pole	23
Spray paint, chalk, or flags	Marking points to sight in aiming	28
Chalk or pencil	Making alignment marks	32
10 ft (3 m) stepladder or small line truck	Connecting supply wires to electrical enclosure	33, 34
Musco supplied tools	**Function**	**Page**
Wooden base wedges	Setting base	11
Level with shim for base taper	Plumbing base	11
Steel bar	Setting base, seating pole on base	11, 32
1 1⁄16 in socket, extension, breaker bar, and 1 1⁄16 in wrench	Tightening structural fasteners	16
5⁄32 in hex key	Attaching handhole covers on base and steel pole	10, 22, 23, 34
9⁄16 in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	14, 17, 19
Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)	Lubricating pole slip-fit connections	13, 28
Wooden shipping blocks	Elevating pole sections off ground during assembly	13
7⁄16 in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	27
Pole rotator kit	Guiding pole onto base, pole alignment	28, 30, 31
Steel chain	Setting pole on base	32
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	34
3⁄16 in hex key	Attaching grounding conductors inside electrical enclosure	33, 34
5⁄16 in hex key	Attaching grounding conductors inside pole at handhole	34, 35
Machinery needed	**Function**	**Page**
Crane or forklift with nylon strapping and 8 ft (2.5 m) sling (sized to weight of base)	Unloading materials, setting bases	9, 11
Auger	Boring holes for bases	10
Load-rated crane, nylon slings, and shackles	Setting poles	29

Documents You Need

- ❑ Musco *Foundation And Pole Assembly Drawing*
- ❑ *Field Aiming Diagram*
- ❑ Alternate foundation design (when present)
- ❑ *Control System Summary*

If you do not have all of these documents, contact your local Musco representative.

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Before You Begin

Electrical System Requirements

While the majority of the Light-Structure System™ can be assembled by non-professionals, a qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

The electrician is generally required to provide these items:

- Service entrance
- Main power disconnect and distribution panel(s)
- Supply wiring and insulated equipment grounding conductors

Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1.

Basic insulation provided between RS-485 control input and main power supply.

Inspect all wiring for damage prior to installation.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

Other features that may affect the wiring supply requirements for this project include:

- Lighting contactor cabinets — refer to installation instructions provided with control equipment and the Musco *Control System Summary.*
- Control-Link® system — refer to installation instructions provided with control equipment and the Musco *Control System Summary*.
- Auxiliary bracket option — customer supplies all wiring for auxiliary components. Refer to *Installation Instructions: Auxiliary Bracket*.

Volunteer Installation

Have a qualified electrician review and complete the following:

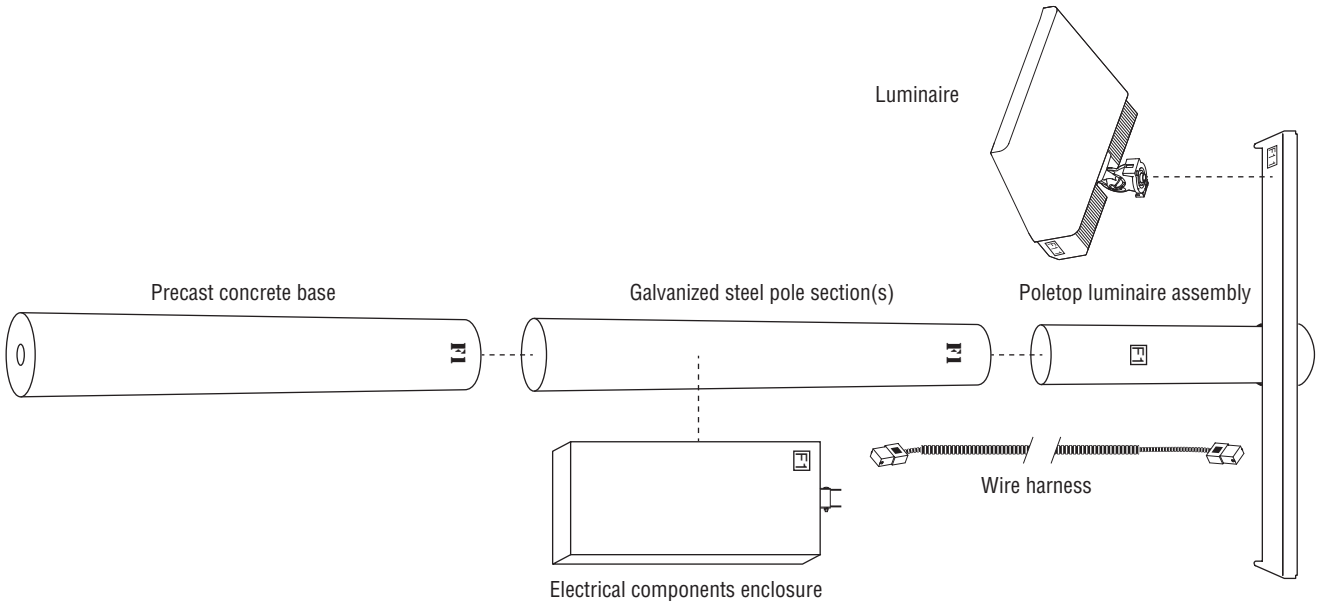
- Create electrical system design — prior to installation.
- Provide and install trenching, supply wiring, and conduit.
- Complete all steps from *Connecting to Supply Wiring* section.
- Test complete lighting system.

Before You Begin

Components Matching and Labeling

Pole locations are identified by a pole ID (A1, A2, B1, B2, etc.) on the *Field Aiming Diagram*. These IDs are also marked on the individual components:

- Poletop luminaire assemblies, bolt-on crossarms, and luminaire shipping cartons
- Wire harnesses
- Electrical components enclosures
- Galvanized steel pole sections
- Precast concrete bases



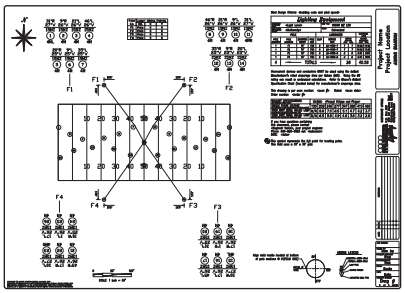
Before You Begin

Documents We Provide

Field Aiming Diagram

The *Field Aiming Diagram* is your map for locating all poles on your project. It gives this information:

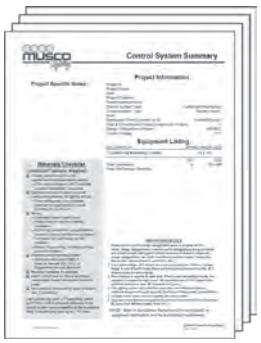
- Pole IDs, locations, and heights
- Luminaire IDs
- Field origin for coordinate measuring
- Common aiming point for all poles, or individual aiming points for each pole
- Factory-set aiming information for each luminaire
- Full load current for each luminaire



Control System Summary

Projects with a control system include a *Control System Summary*. It gives this information:

- Control system diagram and details
- Contactors and cabinets
- Lighting circuits
- Voltage, phase, and frequency information
- Full load current for each circuit

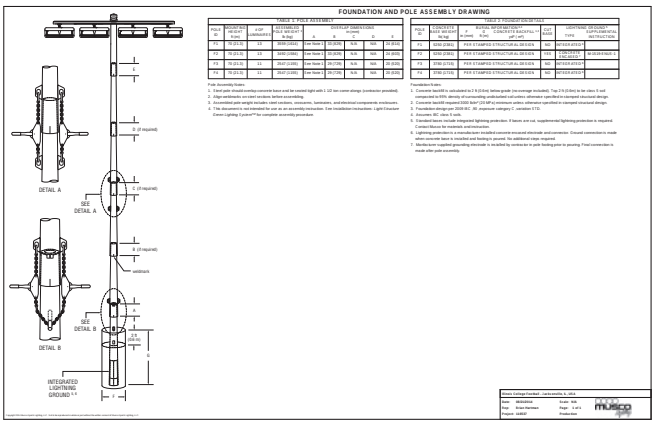


Musco Foundation and Pole Assembly Drawing

This drawing provides information related to the installation of the foundation and the galvanized steel pole.

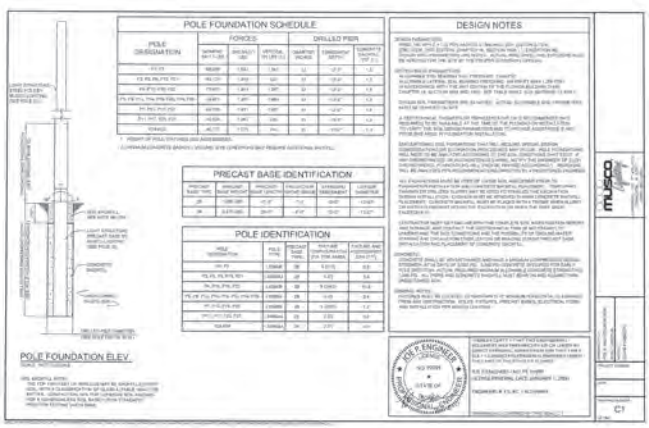
- Pole weight
- Precast concrete base weight
- Hole depth and diameter
- Concrete backfill quantities
- Pole section minimum overlaps

Note: Foundation details are omitted on projects with alternate foundation design.



Alternate Foundation Design

Some poles on a project may require an alternate foundation design. This stamped drawing provides construction details of the alternative design. This document supersedes all other foundation information.



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Before You Begin

Unloading Instructions

A typical shipment includes precast concrete bases, galvanized steel poles, electrical components enclosures, wire harnesses, and poletop luminaire assemblies with luminaires.

For ease of installation, set all matched components by the proper pole location as noted on the *Field Aiming Diagram*.

Tools/Materials Needed

- ❑ Crane with nylon web sling or forklift (load rated)
- ❑ Hammer
- ❑ Pry bar
- ❑ Banding cutters

Warning
Crushing hazard. Product is heavy and may roll.

Do not cut shipping bands or remove blocking from concrete bases or poles until they are supported by unloading equipment.

Use proper pick-up procedures conforming with local regulations when lifting concrete bases and poles. Balance point may not be at midpoint of base or pole.

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store electrical components enclosures and luminaires in a dry location or cover with tarp until ready to install.

Painted poles require special handling, see *Instructions: Painted Pole Special Requirements.*

If additional information is needed, contact your local Musco representative.

Save wooden shipping blocks to use during pole assembly.

Please recycle.
Luminaires, wire harnesses, and other components are shipped in recyclable cardboard packaging.

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Precast Concrete Base

Overview

The precast concrete base is set directly into the ground, backfilled with concrete, and allowed to cure for 12 to 24 hours. The base is designed for easy slip-fit connection to the galvanized steel pole. The remaining components — steel pole, poletop luminaire assembly, electrical components enclosure, and wire harness — are assembled as a unit and set onto the base. The base includes an integrated lightning ground system.

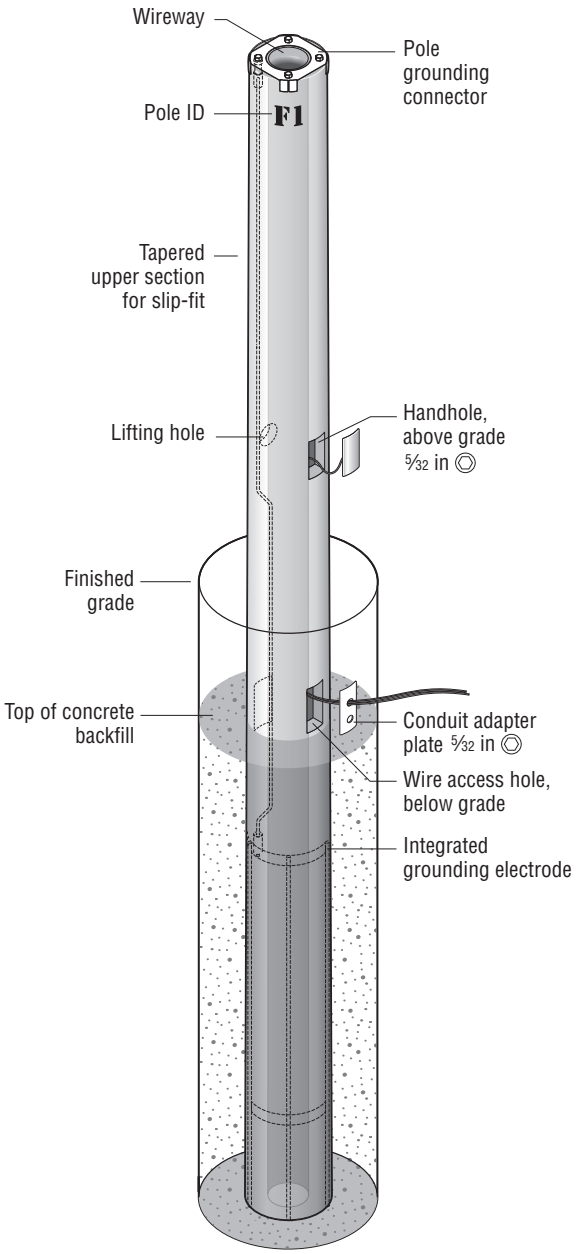
Tools/Materials Needed

Musco Supplied

- ❑ Field Aiming Diagram
- ❑ Musco Foundation and Pole Assembly Drawing or alternate foundation design
- ❑ Steel bar
- ❑ Wooden base wedges
- ❑ Level with shim for tapered base
- ❑ 5⁄32 in hex key

Contractor Supplied

- ❑ Crane or forklift with nylon strapping and 8 ft (2.5 m) sling sized to weight of base
- ❑ Conduit for underground wiring
- ❑ Concrete backfill
- ❑ Water pump (as needed)



Installation Procedure

Verify pole ID on concrete base matches pole location on *Field Aiming Diagram*.

For options on poor soil conditions, alternative installation methods, or if there are any issues with pole locations given, contact your local Musco representative. Your project engineer's name appears on *Field Aiming Diagram*.

Note: Use only project-specific foundation designs as detailed on Musco Foundation and Pole Assembly Drawing or alternate foundation design plan.

1 Mark pole locations per *Field Aiming Diagram*.

2 Excavate holes to size and depth given on Musco *Foundation and Pole Assembly Drawing* or alternate foundation design.

Warning
Fall hazard

Cover holes or install fencing for fall safety.

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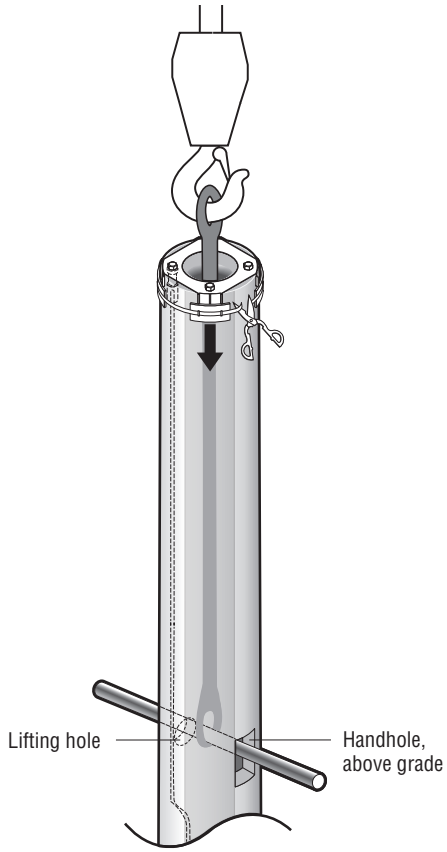
Precast Concrete Base

3 Sling and lower base into hole. Orient wire access hole to accommodate incoming supply wiring. Snip banding and remove tab protectors.

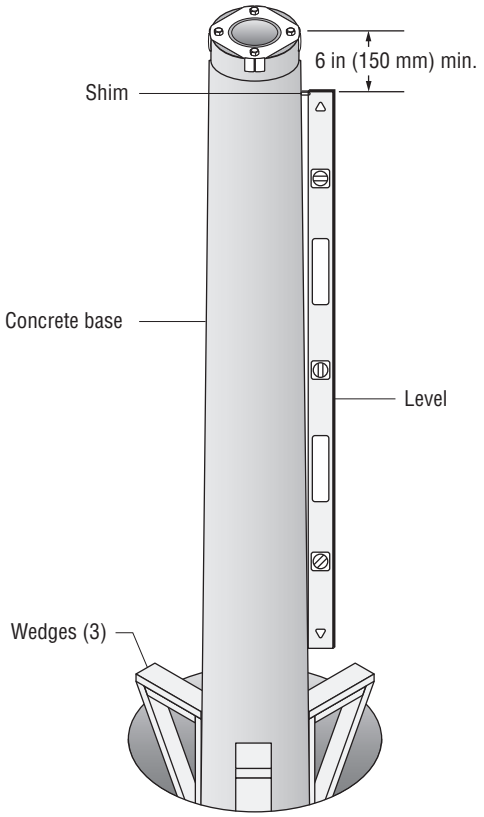


4 Plumb base and wedge into position. Use supplied level with shim on upper end against base. Shim accommodates taper of base. Top of base is beveled. Keep level at least 6 in (150 mm) from top when plumbing.

5 Remove any water from hole to avoid weakening foundation. Water in hole during concrete pour can also cause hollow center of base to fill with concrete.

If backfilling to finished grade with concrete instead of compacted fill, be sure to maintain wire access.

6 Backfill with concrete per Musco *Foundation and Pole Assembly Drawing* or alternate foundation design.



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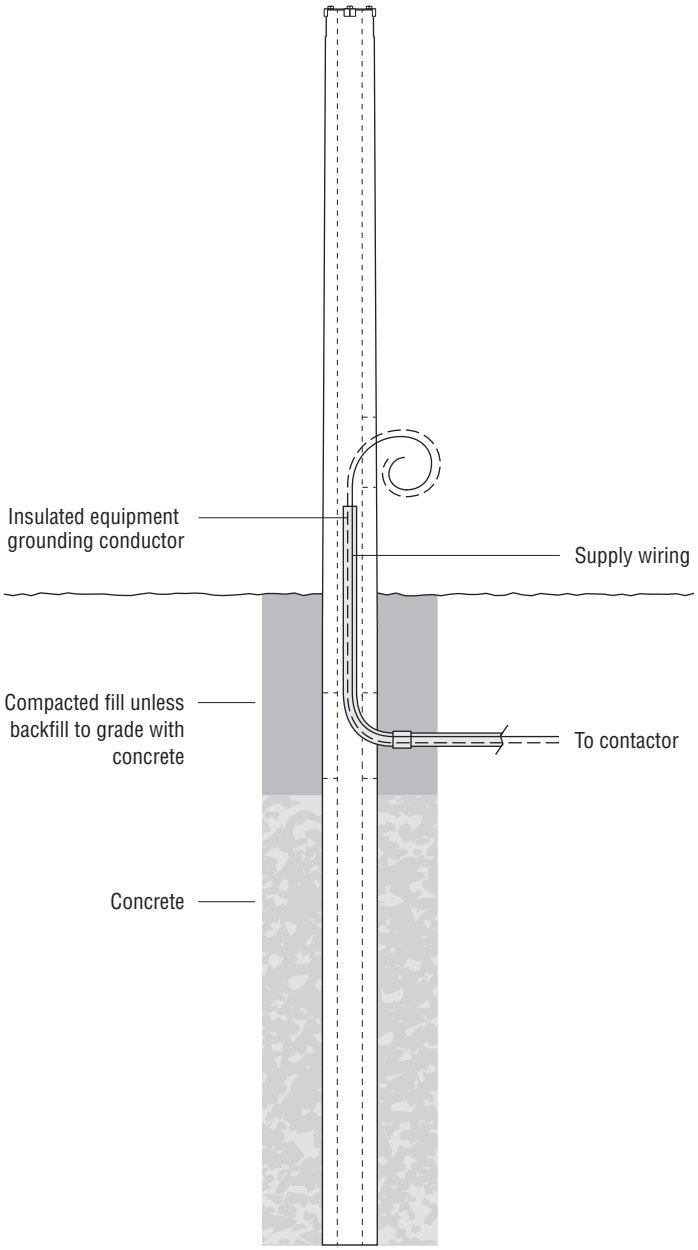
Precast Concrete Base

7 Have your electrician install all underground conduit and wiring, including insulated equipment grounding conductor. Route wires up through base to handhole. Conduit adapter plates with knockouts are provided. You may also install wiring after standing pole.

8 Backfill with compacted soil to finished grade unless alternate foundation design requires concrete to finished grade.



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Galvanized Steel Pole and Poletop Luminaire Assembly

Overview

The galvanized steel pole and poletop luminaire assembly are designed to slip-fit together. Jacking ears on each pole section provide attachment points to pull pole sections together. The Musco *Foundation and Pole Assembly Drawing* gives minimum overlap specifications for each pole section.

Tools/Materials Needed

Musco Supplied

- ❑ Wooden shipping blocks
- ❑ Musco Foundation and Pole Assembly Drawing
- ❑ 9/16 in wrench
- ❑ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Contractor Supplied

- ❑ Two 1½ ton chain come-alongs

Assembly Procedure

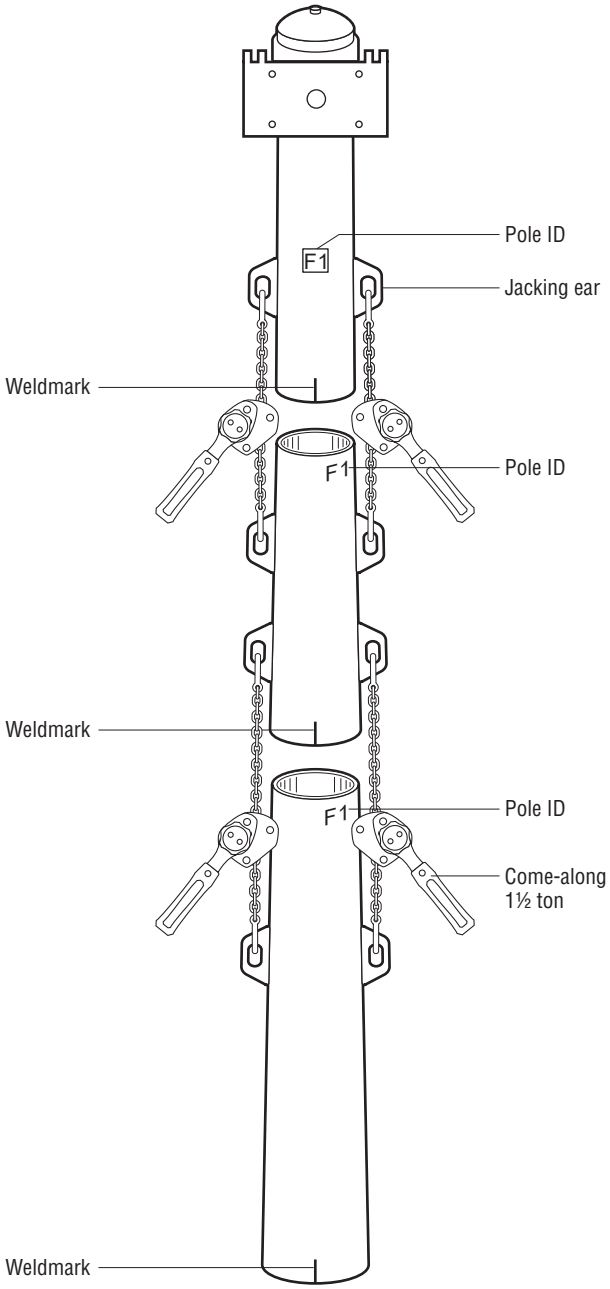
Verify pole ID on each steel pole section matches pole location on *Field Aiming Diagram*. Pole ID is stenciled on inside bottom end and outside top end of each section.

1 Lay out all pole sections and poletop luminaire assembly in sequence. Ensure all weldmarks face same direction. Weldmarks represent field side of pole.

Use shipping blocks as necessary to support pole sections during assembly.

2 Lubricate top of each steel pole section with supplied dishwashing liquid.

3 Align jacking ears. Using two 1½ ton come-alongs, pull sections together evenly until tight. Ensure minimum overlap per Musco *Foundation and Pole Assembly Drawing*. Repeat for all sections.



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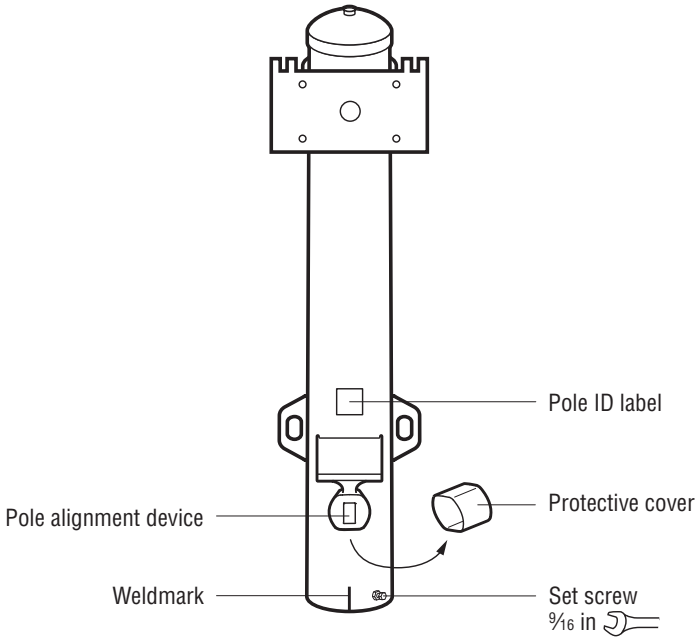
TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER
ATTACHMENT 2

Galvanized Steel Pole and Poletop Luminaire Assembly

4 Tighten set screw using 9⁄16 in wrench.

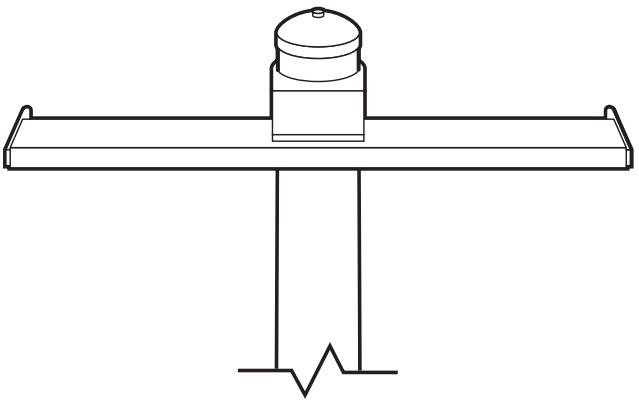
5 Remove protective cover from pole alignment device.



Bolt-on crossarm configuration

If pole has welded crossarms, skip *Bolt-on Crossarms* section. Proceed to *Electrical Components Enclosure section.*

See *Installation Instructions: Platform, Climbing Steps, and Safety Cable,* if your project includes these items.



Welded crossarm configuration

(reference)

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Bolt-on Crossarms

Overview

Due to shipping restrictions, it is sometimes necessary to ship crossarms separate from the poletop section. For these situations, the crossarms are designed to easily attach to the poletop.

Tools/Materials Needed

Musco Supplied:

- ❑ ¾ in drive 1 1/16 in socket
- ❑ ¾ in drive breaker bar
- ❑ ¾ in drive 4 in extension
- ❑ 1 1/16 in wrench
- ❑ Spreader bars
- ❑ ⅜ in fasteners (for spreader bars)
- ❑ ⅝ in structural fasteners
- ❑ 9/16 in wrench

Contractor Supplied:

- ❑ Torque wrench with 7/16 and 9/16 in socket

Assembly Procedure

☑ Verify pole ID on crossarm matches ID of pole.

Note: Each crossarm is factory assembled for a specific position on poletop section to ensure correct aiming. Top side of crossarm is labeled with crossarm's position number. Example: Position 1 is installed on first position from top of poletop section.

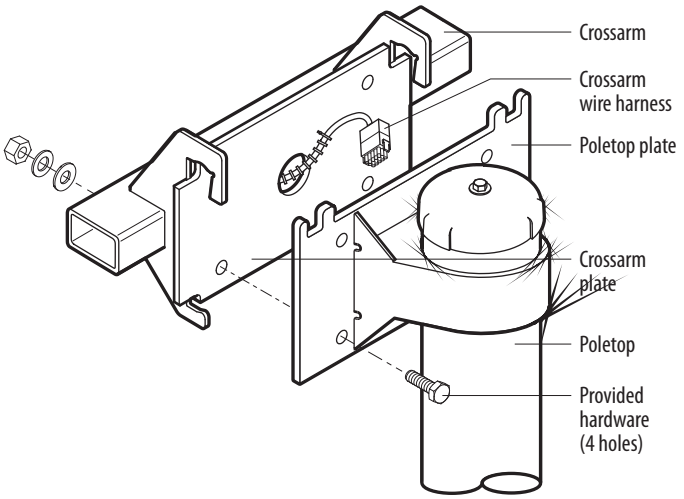
1 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

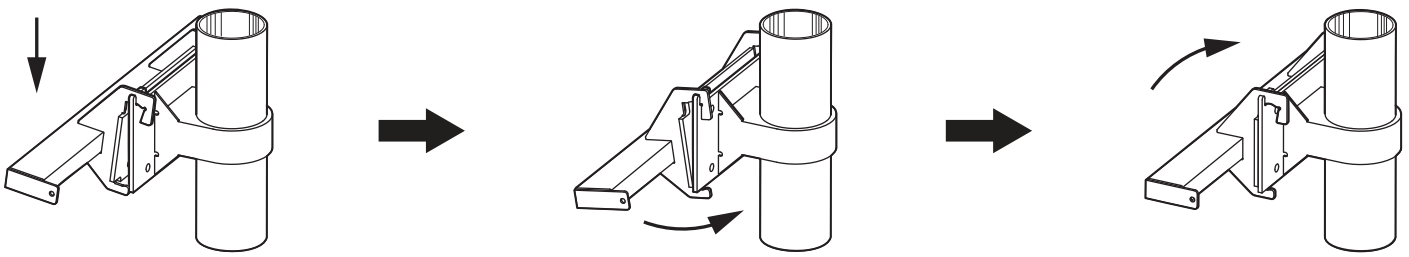
Route wire harness for crossarms 1–3 to top of pole.

Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2 Position crossarm as shown below.

☑ Ensure crossarm wire harness is not pinched between mating plates.





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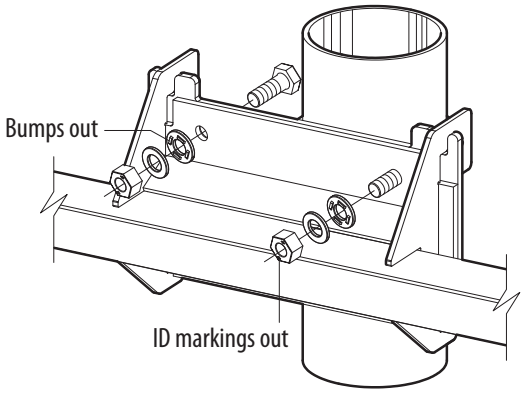
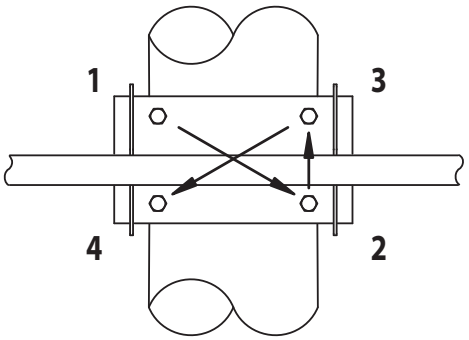
Bolt-on Crossarms

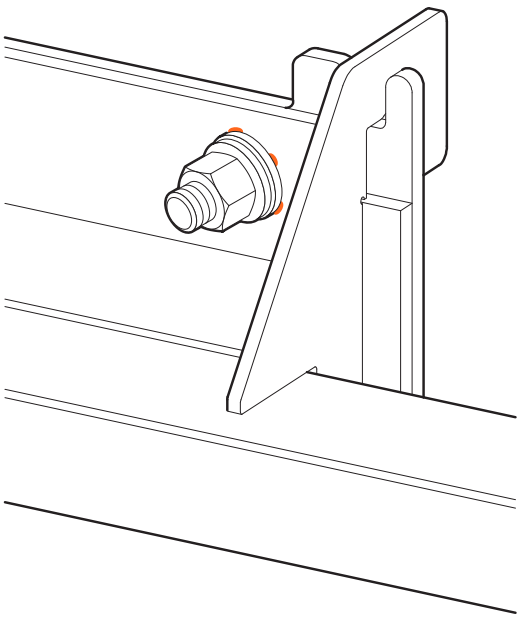
3 Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



4 Snug all nuts. Using supplied 1 1/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



5 Using supplied breaker bar, 1 1/16 in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.



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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER
ATTACHMENT 2

Bolt-on Crossarms

6 Repeat steps 1–5 for remaining crossarms.

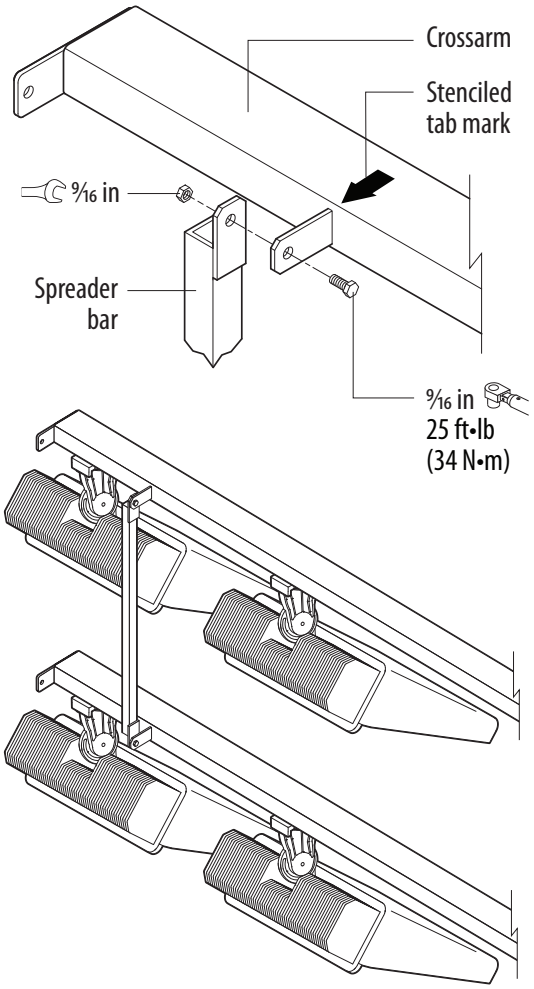
Do not reuse structural fasteners. Discard if removed or loosened after tightening.

Refer to the *Field Aiming Diagram* to determine if a pole requires spreader bars. If so, spreader bars are bundled together and marked with the pole ID. Additionally, the pole crossarms are stenciled indicating which tabs to use. Crossarms are joined in groups of two or three with the greatest grouping on top; do not form other groupings.

7 Install spreader bars with ⅜ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30½ in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.

See *Installation Instructions: Platform, Climbing Steps, and Safety Cable,* if your project includes these items.



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Electrical Components Enclosure

Overview

The electrical components enclosure is factory-wired and tested. Built-in hardware allows for easy attachment to the galvanized steel pole. Quick-connect plug-ins ensure trouble-free connection to the poletop luminaire assembly via the wire harness.

Tools/Materials Needed

Musco Supplied

- ❑ 9⁄16 in wrench
- ❑ 5⁄32 in hex key

Contractor Supplied

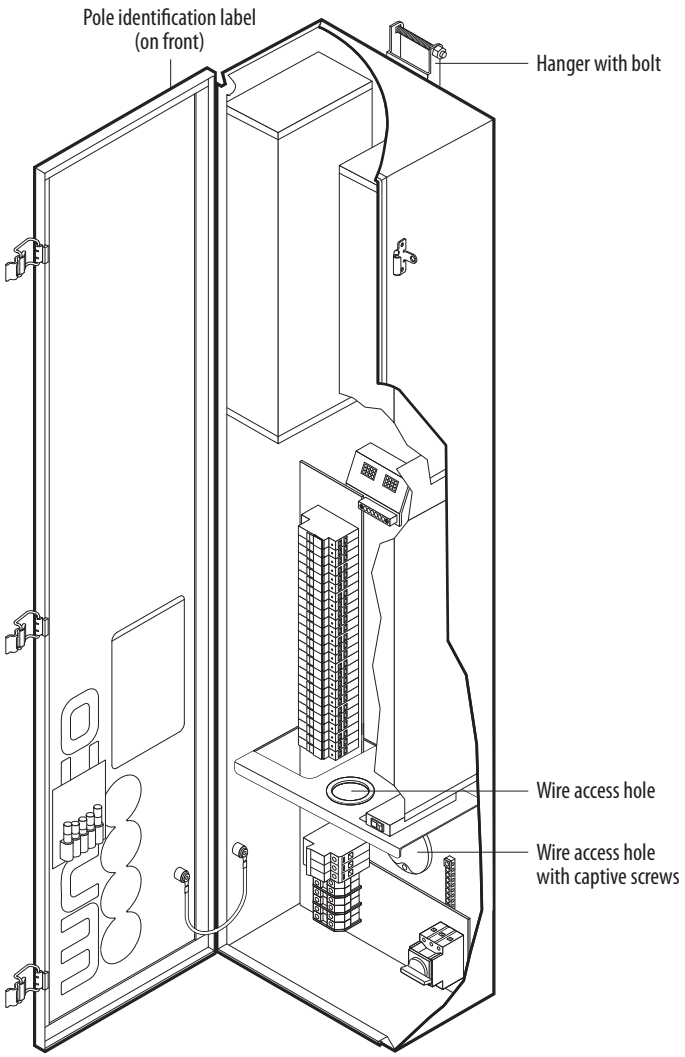
- ❑ Phillips-head screwdriver
- ❑ Standard screwdriver

Assembly Procedure

Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

Caution
Electrical components enclosures are heavy.

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.



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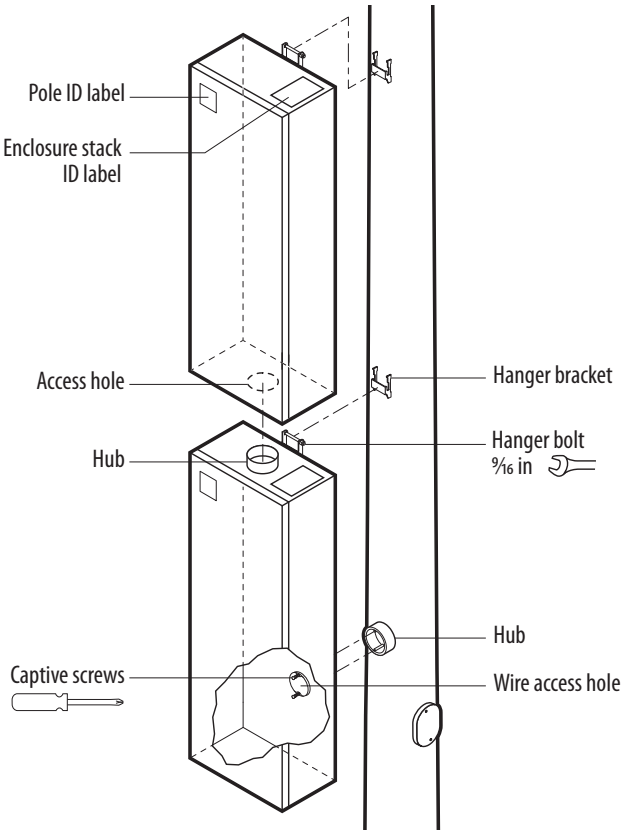
Electrical Components Enclosure

1 Mount bottom enclosure on pole. Align wire access hole with hub. Tighten captive screws using Phillips-head screwdriver. Tighten hanger bolt with 9⁄16 in wrench.

2 Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with 9⁄16 in wrench.

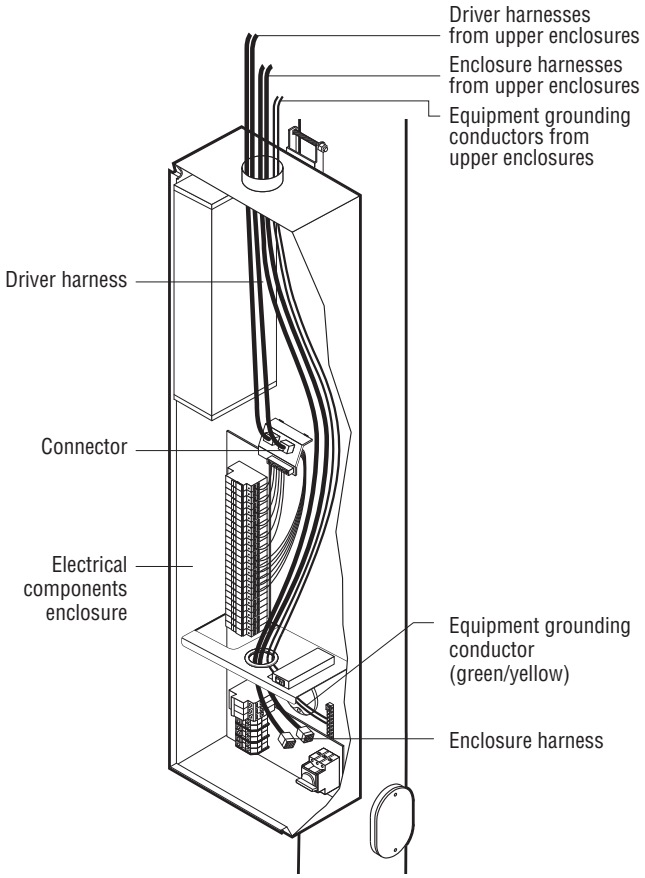


Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician. See section *Connecting to Supply Wiring*.

3 Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

4 Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.

5 Repeat steps 1 – 4 for each stack.



Warning

Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.

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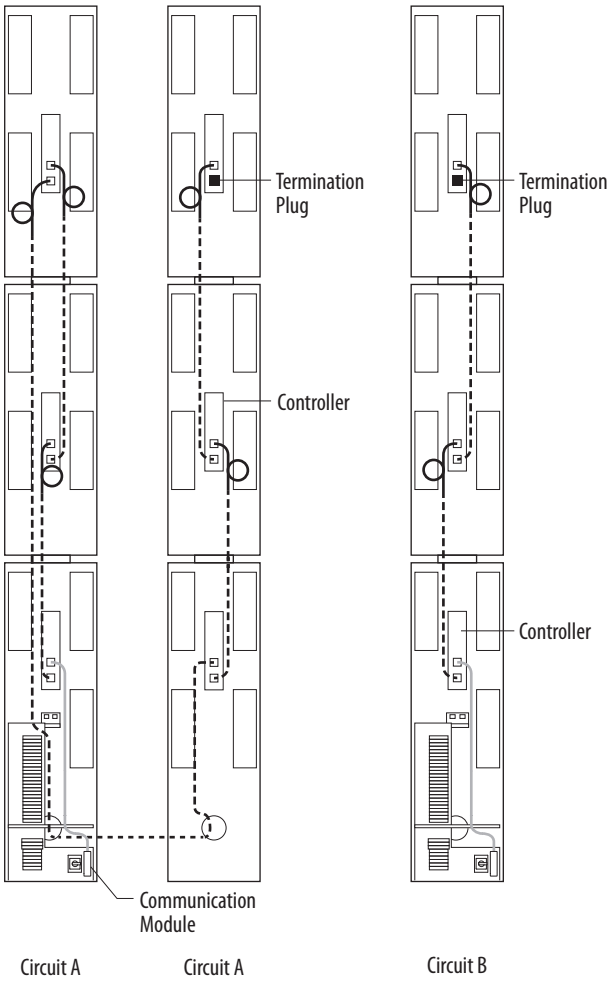
Electrical Components Enclosure

Note: Skip steps 6–7 if controller not present.

6 Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown.



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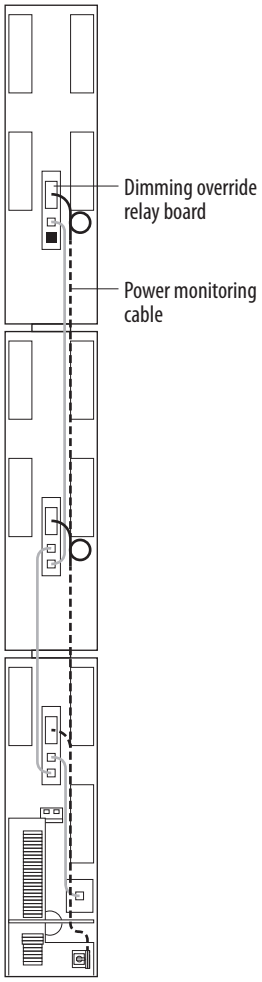
Electrical Components Enclosure

Note: Skip step 7 if emergency egress lighting dimming override relay board is not present.

7 Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



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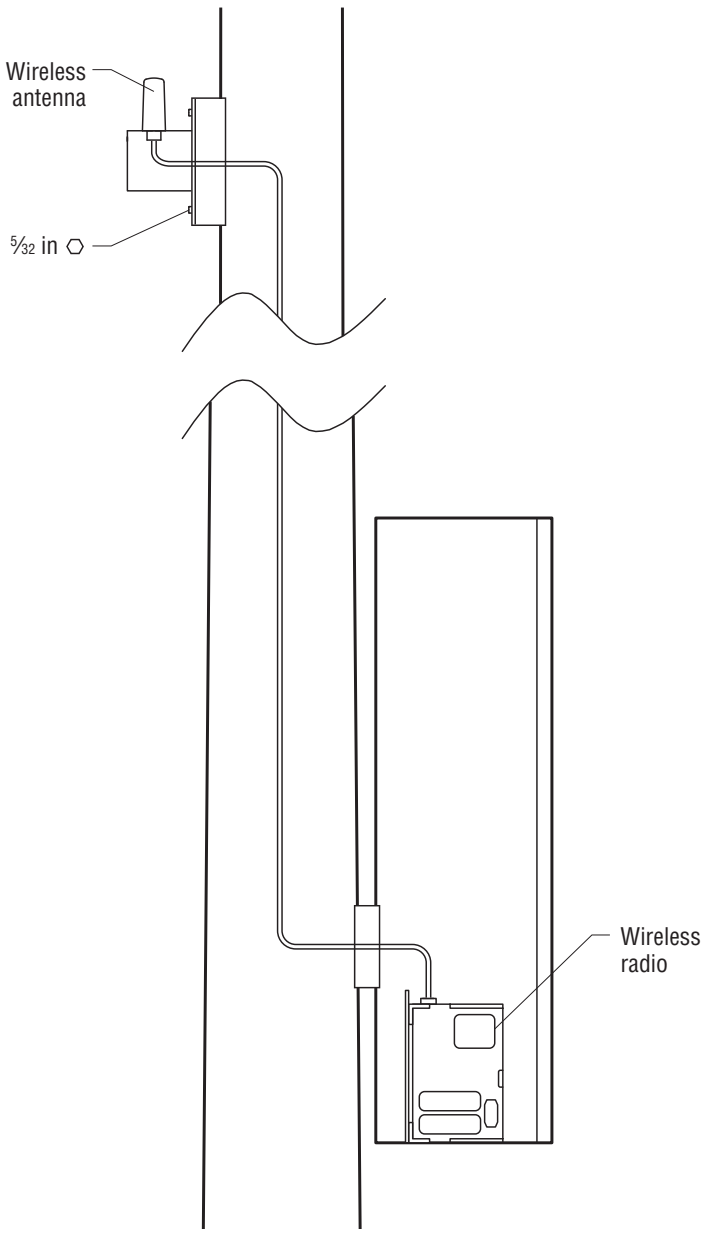
Electrical Components Enclosure

Note: Skip steps 8-9 if wireless antenna not present.

8 Using a 5⁄32 in hex wrench mount the wireless antenna on the handhole provided. Route the coaxial cable down the pole into bottom electrical components enclosure.

9 Install the coaxial cable on the wireless radio located in the electrical components enclosure.



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Wire Harness

Overview

The factory-built wire harness connects the electrical components enclosure to the poletop luminaire assembly.

Tools/Materials Needed

Musco Supplied

- ❑ 5⁄32 in hex key
- ❑ 9⁄16 in wrench

Contractor Supplied

- ❑ Fish tape
- ❑ Electrician's tape

Assembly Procedure

Verify pole ID on wire harness matches pole location on *Field Aiming Diagram.*

1 Remove handhole covers using 5⁄32 in hex key. Remove polecap using 9⁄16 in wrench.

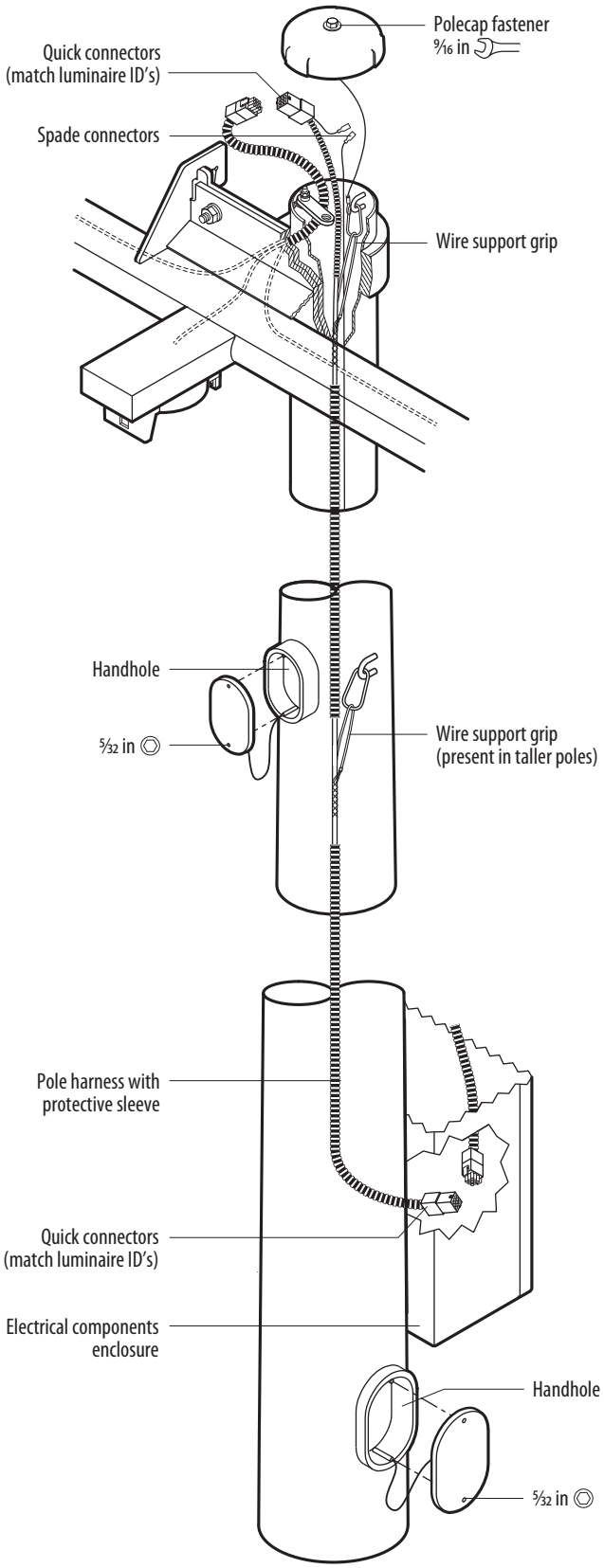
2 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use lower handhole to access enclosure hubs. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

3 Attach support grips at poletop and midpole (if present).

4 Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.

Note: Each bolt-on crossarm has at least one separate harness. There is one additional spade connector for pole alignment beam.

5 Replace handhole covers and polecap.



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Luminaire Attachment

Overview

Luminaires are factory built and shipped in individual cartons. They are aimed in the factory and ready for installation. Do not disassemble knuckle.

Tools/Materials Needed

Musco Supplied

❑ 7⁄16 in ratcheting combination wrench

Note: Leave luminaires in box until ready to assemble. Keep protective cover on luminaire until ready to set pole. Do not leave luminaires unassembled from crossarm in wet conditions.

Contractor Supplied:

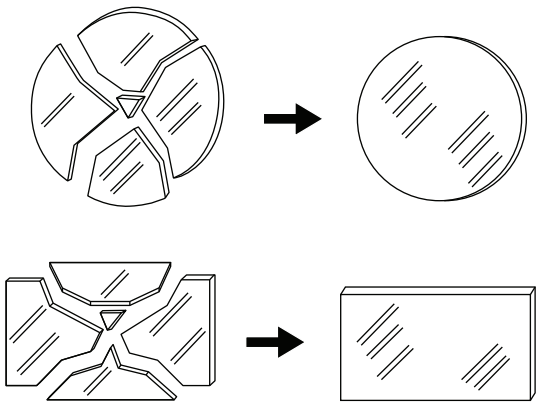
❑ Torque wrench with 7⁄16 in socket

Caution
No User Serviceable Parts

If protective lens glass is cracked or broken, luminaire must be replaced.

Luminaire light source is not replaceable; when light source reaches end of life entire luminaire must be replaced.

Contact your local Musco representative for maintenance or replacement.



Luminaire Attachment

Assembly Procedure

Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1 Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.

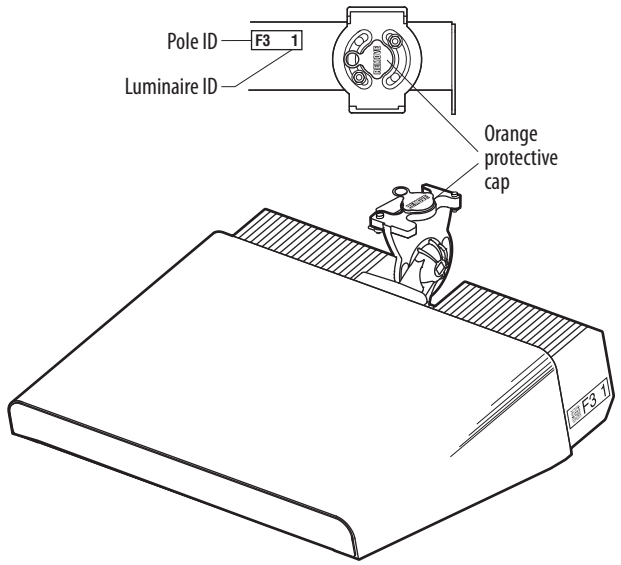
Warning

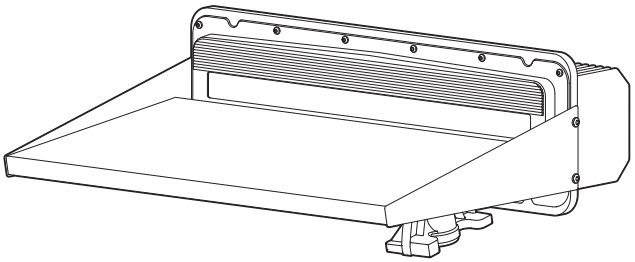
Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.

Some luminaires may attach to auxiliary brackets, refer to *Installation Instructions: Auxiliary Bracket*.





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Luminaire Attachment

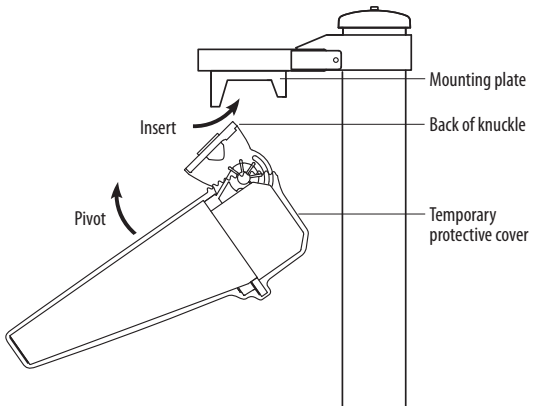
2 Match luminaire ID to crossarm and install luminaire onto mounting plate. Insert back of knuckle into mounting plate and pivot into position.

Note: The luminaire style may vary from what is shown.

Luminaire	Weight
TLC-LED-350	25 lb (11 kg)
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-LED-550NR	38 lb (17 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-900NB	114 lb (52 kg)
TLC-LED-1150	80 lb (36 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1400NB	106 lb (48 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)
TLC-TW	40 lb (18 kg)
TLC-LED-550NR	38 lb (17 kg)

Caution

Luminaire may be heavy. Lift carefully with two people to avoid injury.



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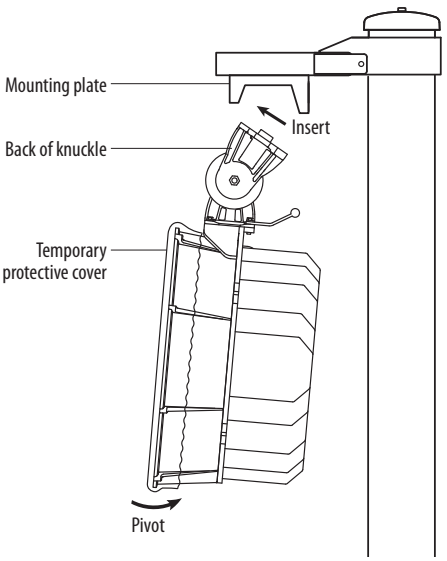

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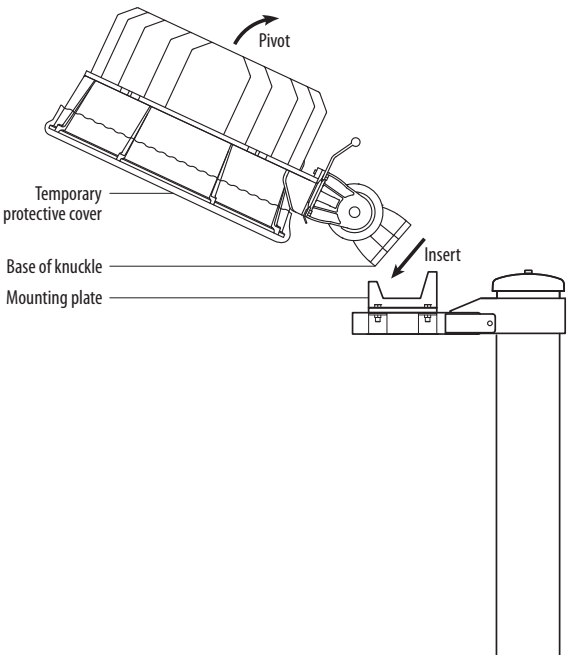

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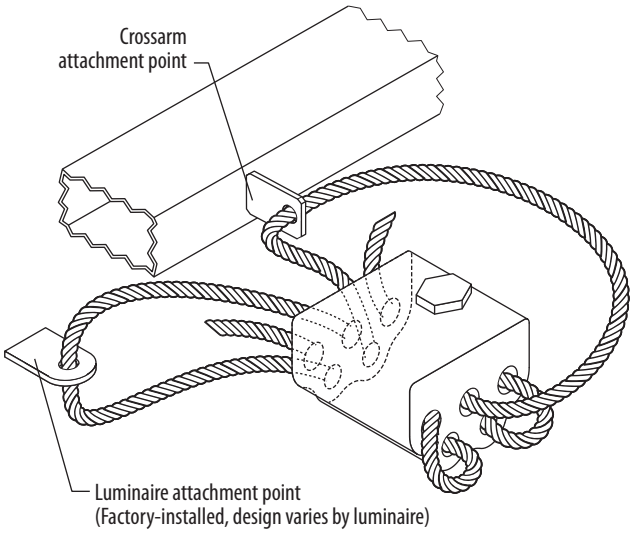
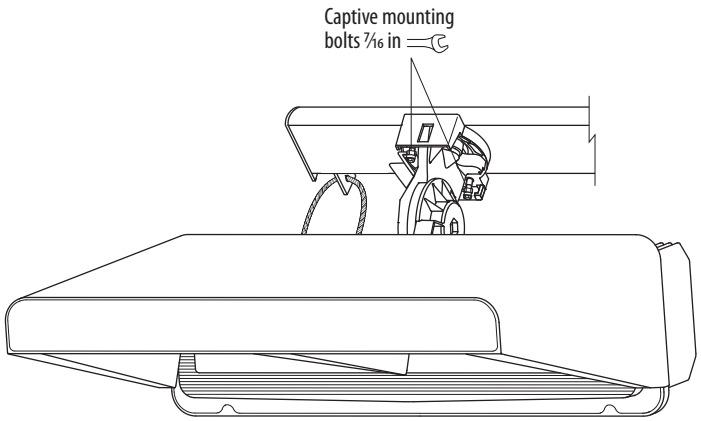
Luminaire Attachment

3 Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

4 Using 7⁄16 in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m)



5 Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight - continue tightening. Torque must not exceed 20 ft•lb (27 N•m). To avoid overtightening, use provided 7⁄16 in combination wrench.



Warning
Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.

See *Installation Instructions: Climbing Steps and Safety Cable,* if your project includes these items.

Warning

Pole rotation may be required to assemble all components onto the pole. Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow for pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

Caution - Equipment Damage

Properly support pole to ensure components do not get damaged. Do not attach components to pole without the pole being properly supported.

If pole has auxiliary equipment, refer to *Installation Instructions: Auxiliary Bracket*.

Note: Attaching auxiliary brackets before setting pole may interfere with slings. Attaching auxiliary brackets after pole is set may be preferable depending on height of auxiliary bracket.

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Pole Setting and Alignment

Overview

All luminaires are factory aimed to their exact position on the field. To ensure the proper pole orientation, a simple-to-use pole alignment beam completes the precision field aiming. The pole alignment beam is attached in the factory to each pole.

Tools/Materials Needed

Musco Supplied

- ❑ *Field Aiming Diagram*
- ❑ Steel chain
- ❑ Steel bar
- ❑ Pole rotator kit
- ❑ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)
- ❑ Level

Contractor Supplied

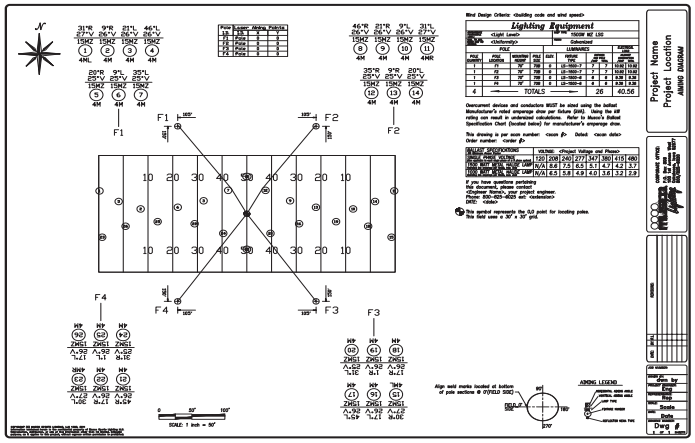
- ❑ Chalk or pencil
- ❑ Load-rated shackles as required
- ❑ Load-rated nylon slings as required
- ❑ Spray paint, chalk, or flags (to mark aiming points on field)
- ❑ Two 1½ ton chain come-alongs

Installation Procedure

✓ Verify pole ID matches precast concrete base and pole location on *Field Aiming Diagram*.

1 Mark aiming point(s) on field using *Field Aiming Diagram*. Poles may have individual aiming points or may all be aimed to a common point.

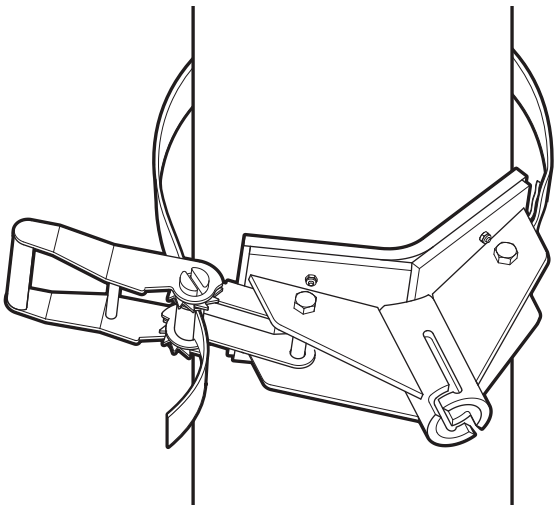
2 Lubricate concrete base with provided dishwashing liquid.



3 Attach pole rotator clamp approximately 12 in (300 mm) above bottom of pole. Wrap strap around pole and cinch tightly.

⚠ **Caution**
Risk of injury or property damage.

Rotator bar can swing with force as pole is lifted. Do not install until you are ready to lower pole onto base (step 8).



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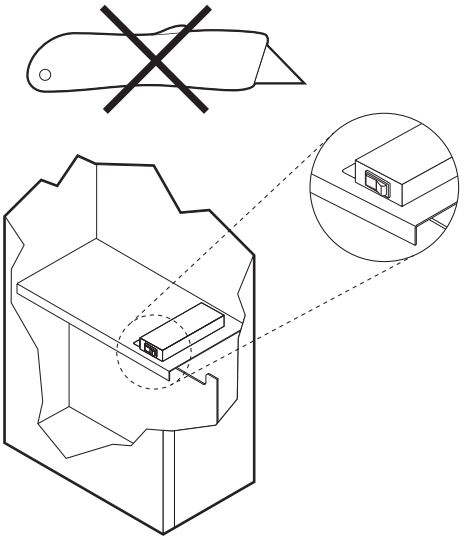
Pole Setting and Alignment

4 Remove temporary protective cover from luminaires (if present). Do not use knife.



Warning
Laser radiation hazard

Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter).

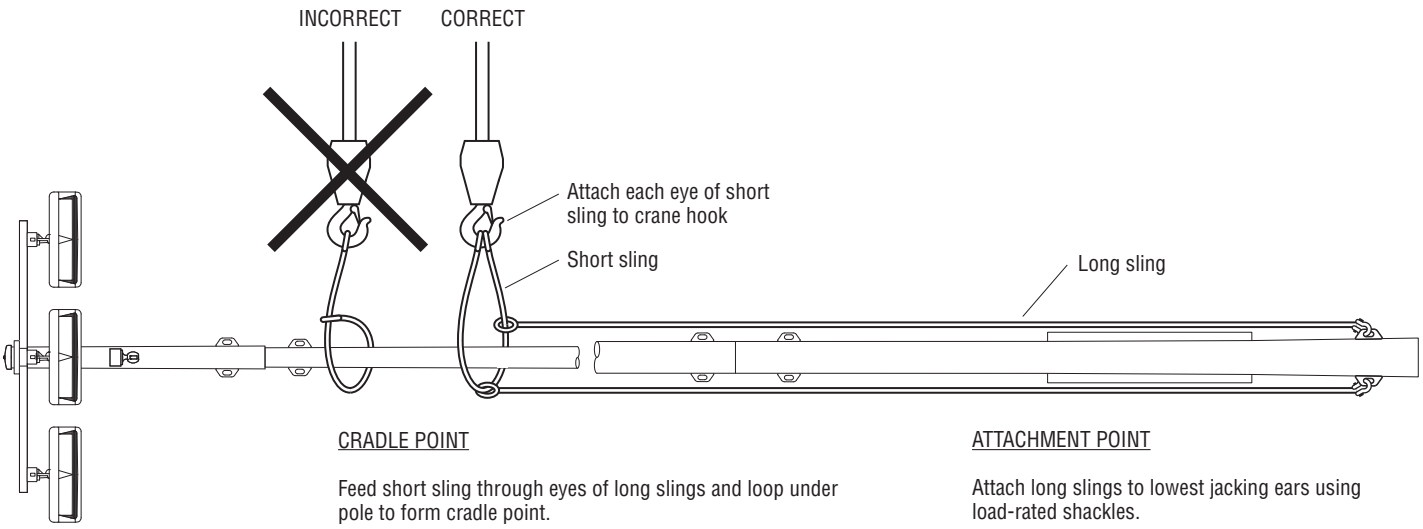
5 Turn on alignment beam and check. Device has toggle switch inside electrical components enclosure. For poles with platforms, alignment beam device has a rotary switch located on the back of the alignment device.

Warning
Improper rigging can cause pole sections to separate and fall.

Follow these instructions carefully. Do not choke pole or lift from crossarms.

6 Sling pole using this recommended method (see illustration). You must lift pole from lowest section. Friction between assembled sections will not hold pole together when lifting. To keep pole upright when lifting, ensure cradle point is above pole center of gravity. Ensure cradle point is free and will not cinch around pole or snag on hardware or components during lifting.

Warning



CRADLE POINT

Feed short sling through eyes of long slings and loop under pole to form cradle point.

Ensure cradle point is free and will not cinch around pole or snag on hardware or components during lifting.

Cradle point must be above pole assembly center of gravity.

ATTACHMENT POINT

Attach long slings to lowest jacking ears using load-rated shackles.

Lowest jacking ears carry entire weight of pole.

All slings must be rated for complete pole weight. Refer to Musco *Foundation and Pole Assembly Drawing*.

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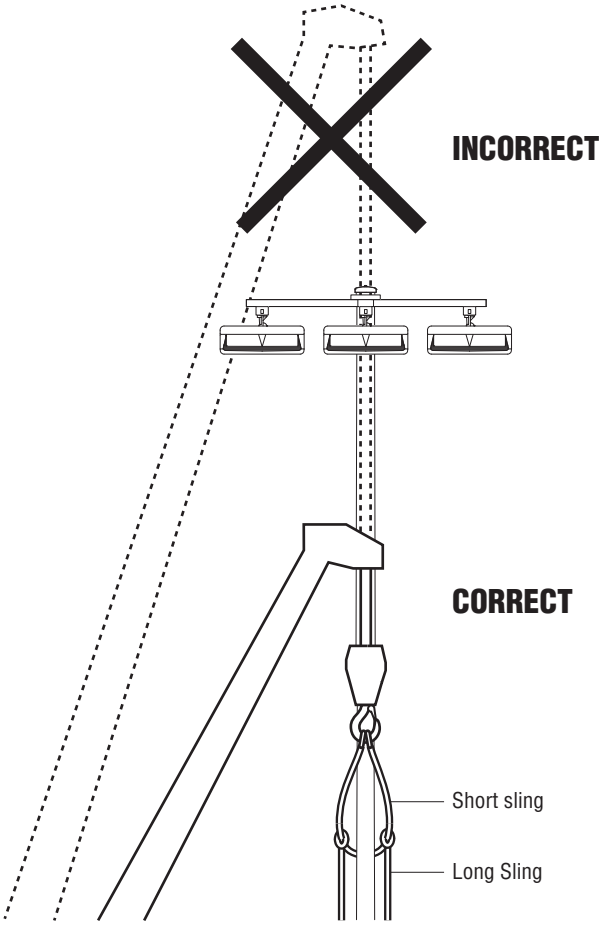
Pole Setting and Alignment

Warning
Crushing hazard

Pole can rotate with force, causing injury.

Do not stand under pole when lifting. Steady pole with two people holding crossarms. Allow pole to safely rotate around when it is high enough for crossarms and electrical components enclosures to clear the ground.

7 Lift pole. Use care to avoid dragging bottom of pole. Keep crane head below crossarms.



Watch for these signs to ensure you are lifting pole properly:

- Short sling slides freely up the pole and long slings tighten.
- Top of pole rises first.
- Short sling does not choke or snag on pole.
- Lowest jacking ears carry entire weight of pole.

8 When pole is suspended, insert rotator bar to clamp and turn to lock in place. Guide pole into position over base using rotator bar and lower onto base. Do not allow pole to seat on base until it is properly aimed (step 9). Pole should rotate with reasonable force applied to bar, but not freely.

Warning
Pinching hazard

Keep hands clear when setting pole on concrete base.

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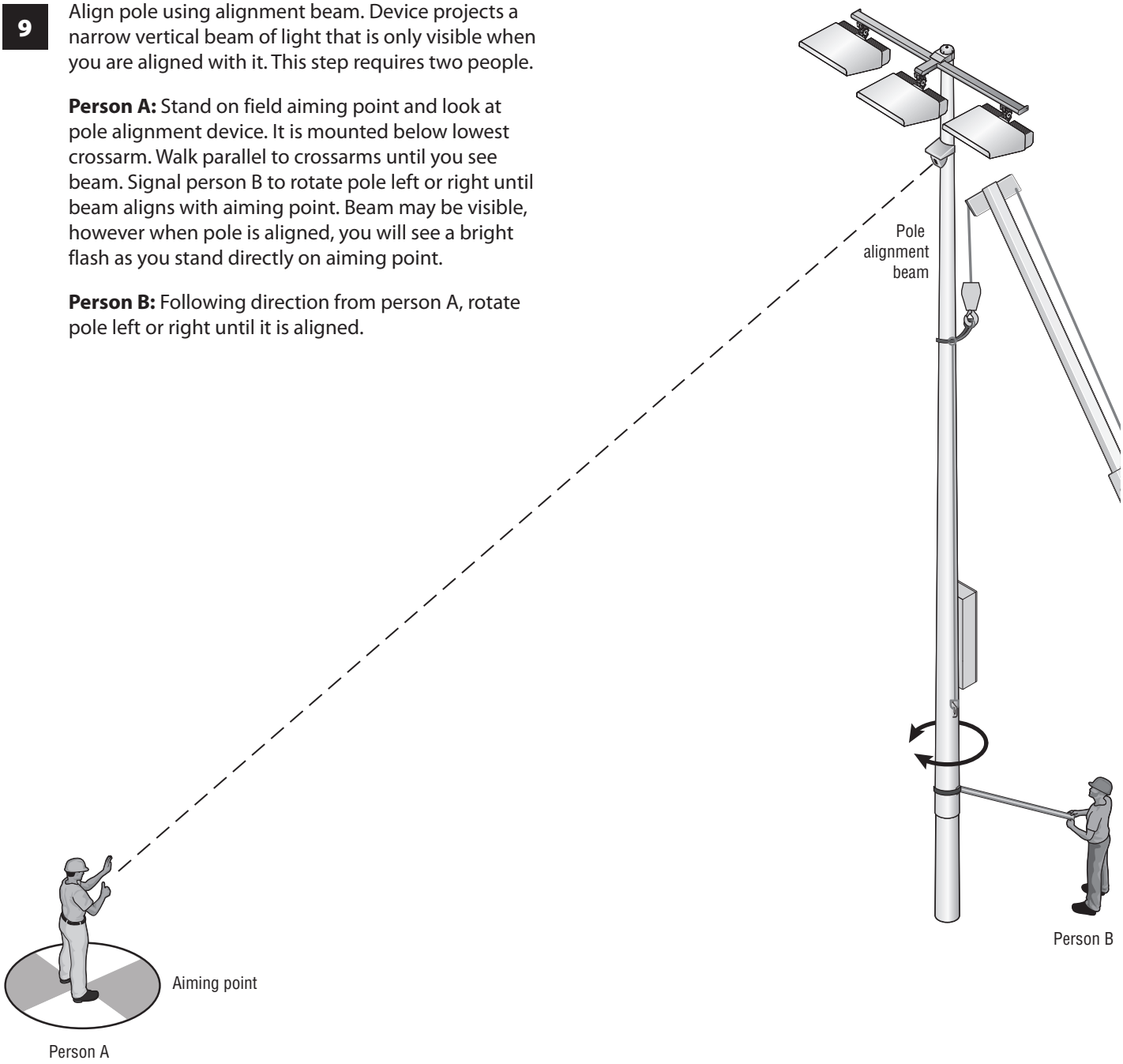
Pole Setting and Alignment

9

Align pole using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is mounted below lowest crossarm. Walk parallel to crossarms until you see beam. Signal person B to rotate pole left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

Person B: Following direction from person A, rotate pole left or right until it is aligned.



Warning
Laser radiation hazard

Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.

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Pole Setting and Alignment

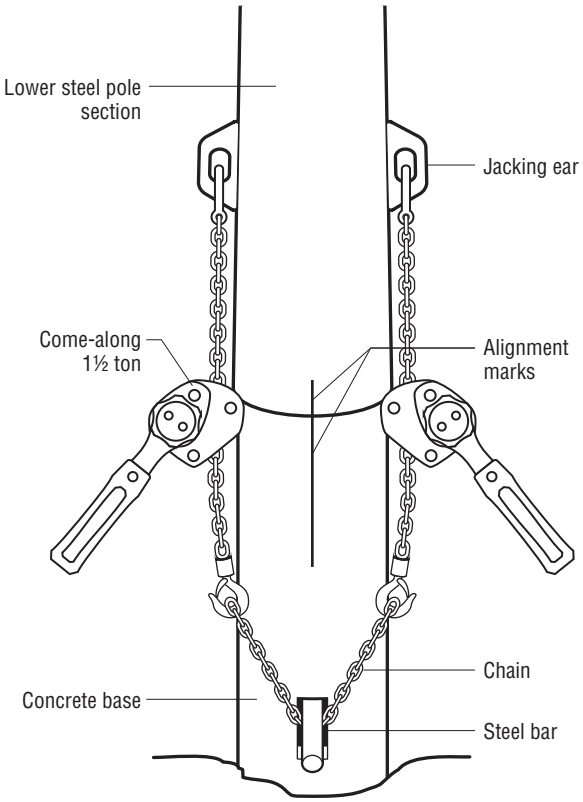
10 Once pole is aligned, use level to draw a thin vertical alignment mark on pole and concrete base. Use mark to verify alignment is maintained while lowering pole (step 11) and jacking onto base (step 12).

11 Lower pole into position. Hold pole rotator bar to maintain alignment until pole seats on base. Remove rotator bar and clamp.

12 Insert provided steel bar through base. Wrap provided chain around base below steel bar. Attach two 1½ ton come-alongs to jacking ears. To avoid twisting, attach come-alongs to provided chain directly below jacking ears. If ears align parallel with steel bar, do not use chain. Pull pole down onto base, keeping marks aligned. Ensure minimum overlap per Musco *Foundation and Pole Assembly Drawing*.

If pole seats out of alignment, contact Musco to request separating tools. See *Installation Instructions: Separating Steel Pole from Concrete Base*.

If pole has climbing steps and safety cable, see *Installation Instructions: Climbing Steps and Safety Cable* for cable tensioning instructions.



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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER
ATTACHMENT 2

Connecting to Supply Wiring

Overview

The final step of installation is connecting the supply wiring at the subpanel. Terminals for phase wires and neutral (if used), disconnect switch with lockout, and equipment ground bar are provided on the subpanel in the electrical components enclosure. If there are multiple circuits on the pole, a disconnect is provided for each circuit. This may be on a separate subpanel in another enclosure. The lighting system uses an integrated lightning ground embedded in the precast concrete base. Depending on foundation design and/or soil conditions, a supplemental grounding electrode may be required.

Tools/Materials Needed

Musco Supplied

- ❑ 3⁄16 in hex key (ground bar)
- ❑ 5⁄16 in hex key (bonding terminal inside handhole)
- ❑ 5⁄32 in hex key (handhole covers)
- ❑ 5 mm hex key (125 A disconnect terminals)
- ❑ Equipment bonding jumper

Contractor Supplied

- ❑ Underground wiring and conduit
- ❑ Main power disconnect and distribution panel(s)
- ❑ Standard screwdriver
- ❑ 3 m (10 ft) stepladder or small line truck

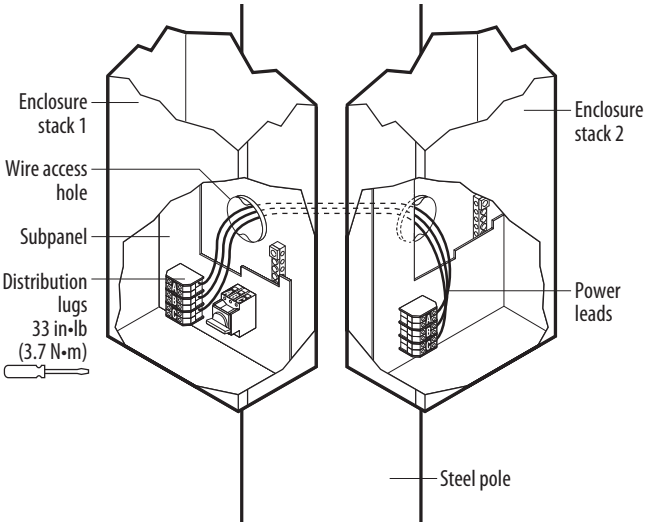
Installation Procedure

Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear.

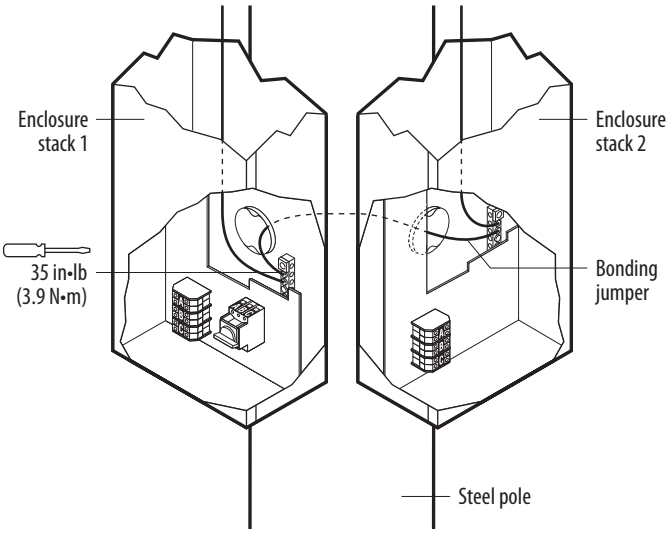
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.

1 If pole has multiple stacks on the same electrical circuit, route lower loads from second stack to distribution lugs on main subpanel.

Route all power leads for lighting equipment to appropriate subpanel locations.



2 Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one. Tighten lugs using 3⁄16 in hex key.



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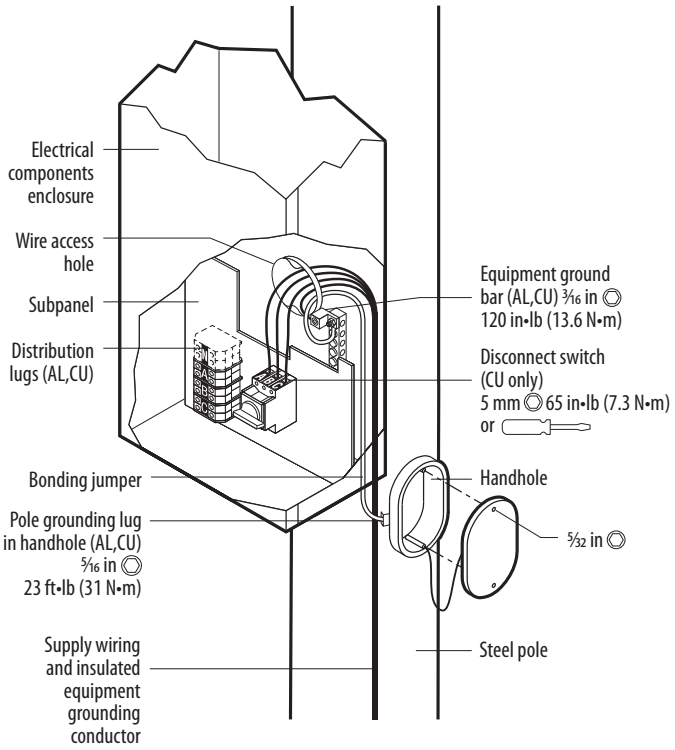
Connecting to Supply Wiring

3 Remove handhole cover using 5⁄32 in hex key. Rout supply wiring through access hub into electrical components enclosure.

4 Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using 3⁄16 in hex key.

Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.

5 Connect phase wires (supply) to disconnect switch. Tighten lugs using standard screwdriver (45 A disconnect) or 5 mm hex key (125 A disconnect). Connect neutral wire (if used) to distribution lug. Tighten lug using standard screwdriver.



Disconnect Wiring Information

Disconnect Rating	Terminal	Wire Size Range	Strip Length	Torque
45 A	L	12 – 3 AWG (4 – 25 mm²)*	0.63 in (16 mm)	25 in•lb (2.8 N•m)
	N	16 – 4 AWG (1.5 – 25 mm²)*	0.56 in (14 mm)	27 in•lb (3.1 N•m)
	G	14 – 2/0 AWG (2.5 – 50 mm²)**	NA	120 in•lb (13.6 N•m)
125 A	L	10 – 2 AWG (6 – 35 mm²)*	0.63 in (16 mm)	50 in•lb (5.6 N•m)
		1 – 2/0 AWG (40 – 50 mm²)*	0.63 in (16 mm)	65 in•lb (7.3 N•m)
	N	16 – 1/0 AWG (1.5 – 50 mm²)*	0.71 in (18 mm)	33 in•lb (3.7 N•m)
	G	14 – 2/0 AWG (2.5 – 50 mm²)**	NA	120 in•lb (13.6 N•m)

*Stranded cable, single conductor, copper only

**Stranded cable, single conductor, copper or aluminum

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Connecting to Supply Wiring

6 Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 5/16 in hex key.

7 Ensure all handhole covers are installed and electrical components enclosure is closed and latched.

If your project includes a supplemental grounding electrode kit, follow instructions in kit for installing electrode.

Warning
Risk of electric shock.

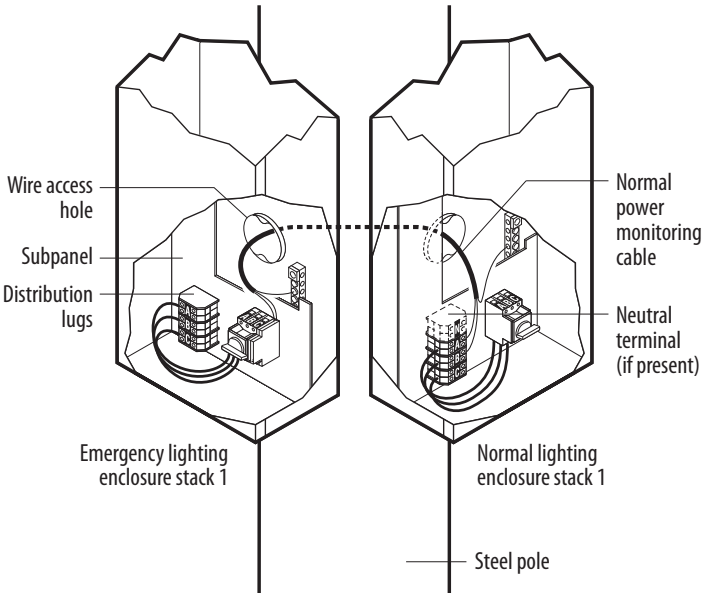
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

Warning
Lightning hazard.

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

Note: Skip step 8 if no emergency egress lighting is present.

8 Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.



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ATTACHMENT 2

Musco Light-Structure System™ product referenced or shown may be protected by one or more of the following patents. United States Patent(s): D593883, D794244, D841854, D841855, D841856, D872350, D872351, D872927, D872928, D872929, D873462, D874050, D880035, D882141, D882850, D882860, D892375, D892376, 8163993, 8300219, 8742254, 8789967, 9435517, 9781780, 9951929, 10267491, 10330284, 10344948, 10549384. Benelux: 87546-01, 87547-01, 87548-01, 87990-01, 87991-01, 87992-01, 87994-01, 87995-01. 88535-01, 88536-01. Canada Patent(s): 2912148. China Patent for Invention 中国发明专利: ZL201280036994.1, ZL201380077801.1, ZL201610187066.5. China Patents for Design 中国外观设计专利: ZL201830262493.5, ZL201830262495.4, ZL201830262588.7, ZL201930116087.2. European Patent(s): 2715222, 2999920. Germany Patents: 402018100450-0001, 402018100451-0001, 402018100452-0001, 402019100343, 402019100344, 402019100345, 402019100346, 402019100347, 402019100348. Mexico Patent(s): 346527. Republic of Korea Patent(s): 10-1577571, 10-1661263, 10-1881998, 30-1014229, 30-1014230, 30-1014231, 30-1037776, 30-1037783-0001-0004, 30-1037788-0001-0004, 30-1037795, 30-1037796-0001 – 0004, 30-1037802-0001 – 0004. Russia Patent: 2616559. United Kingdom Patent(s): 6032011, 6032022, 6032023, 6056943, 6056944, 6056945, 6056946, 6056947, 6056948. U.S. and foreign patents pending. [Pat_057R]

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ATTACHMENT 2

Tewinkle Park Tennis

Costa Mesa,CA

Lighting System

Pole / Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
T1, T8	50'	50'	2	TLC-LED-550	1.08 kW	A
T2	50'	50'	2	TLC-LED-550	1.08 kW	A
		50'	2	TLC-LED-550	1.08 kW	B
T3	50'	50'	2	TLC-LED-550	1.08 kW	B
		50'	2	TLC-LED-550	1.08 kW	C
T4	50'	50'	2	TLC-LED-550	1.08 kW	C
T5	50'	50'	2	TLC-LED-550	1.08 kW	C
		50'	2	TLC-LED-550	1.08 kW	D
T6	50'	50'	2	TLC-LED-550	1.08 kW	C
		50'	2	TLC-LED-550	1.08 kW	B
		50'	2	TLC-LED-550	1.08 kW	E
		50'	2	TLC-LED-550	1.08 kW	D
T7	50'	50'	2	TLC-LED-550	1.08 kW	B
		50'	2	TLC-LED-550	1.08 kW	A
T9, T14	50'	50'	2	TLC-LED-550	1.08 kW	F
T10	50'	50'	2	TLC-LED-550	1.08 kW	F
		50'	2	TLC-LED-550	1.08 kW	E
T11	50'	50'	2	TLC-LED-550	1.08 kW	D
T12	50'	50'	2	TLC-LED-550	1.08 kW	D
		50'	2	TLC-LED-550	1.08 kW	E
T13	50'	50'	2	TLC-LED-550	1.08 kW	F
		50'	2	TLC-LED-900	1.78 kW	E
14			***48***		***26.62 kW***	

Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Tennis 1-2	4.32 kW	8
B	Tennis 3-4	4.32 kW	8
C	Tennis 5-6	4.32 kW	8
D	Tennis 7-8	4.32 kW	8
E	Tennis 9-10	5.02 kW	8
F	Tennis 11-12	4.32 kW	8

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-550	LED 5700K - 75 CRI	540W	67,000	>120,000	>120,000	>120,000	46
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>120,000	>120,000	>120,000	2

Single Luminaire Amperage Draw Chart

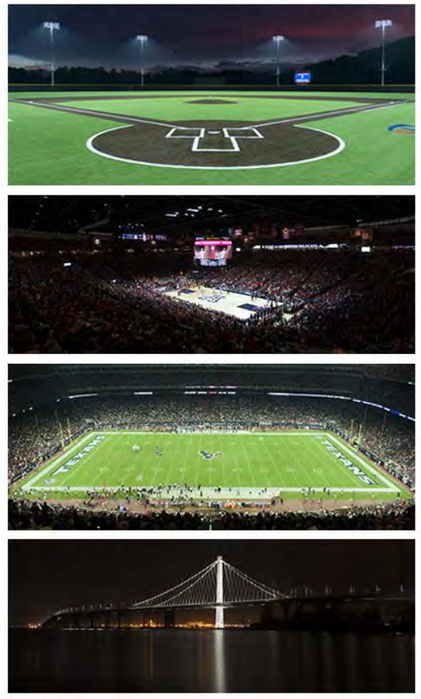
Driver (.90 min power factor)	Max Line Amperage Per Luminaire						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	1.8	1.4
TLC-LED-900	5.3	5.0	4.6	4.0	3.2	2.9	2.3

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Tennis 1-2	Horizontal Illuminance	32.4	23	39	1.65	1.41	A	8
Tennis 11-12	Horizontal Illuminance	30.4	20	38	1.87	1.52	F	8
Tennis 3-4	Horizontal Illuminance	31.8	23	39	1.73	1.38	B	8
Tennis 5-6	Horizontal Illuminance	33	24	44	1.87	1.37	C	8
Tennis 7-8	Horizontal Illuminance	32.6	26	39	1.50	1.25	D	8
Tennis 9-10	Horizontal Illuminance	31.4	25	40	1.63	1.26	E	8

From Hometown to Professional



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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	T1, T8	50'	-	50'	TLC-LED-550	2	2	0
2	T2, T7	50'	-	50'	TLC-LED-550	4	2	2
4	TOTALS					12	8	4

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

ENGINEERED DESIGN By: D. Lohman · File #215837A · 21-Jul-23

Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 1-2**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	32.35
Maximum:	39
Minimum:	23
Avg / Min:	1.38
Guaranteed Max / Min:	**2.5**
Max / Min:	1.65
UG (adjacent pts):	0.00
CU:	0.72
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	A
No. of Luminaires:	**8**
Total Load:	4.32 kW

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 RP-6-15.

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

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

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
3	T2-T3, T7	50'	-	50'	TLC-LED-550	4	2	2
1	T6	50'	-	50'	TLC-LED-550	4/4*	2	6
4	TOTALS					20	8	12

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

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 3-4**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	31.84
Maximum:	39
Minimum:	23
Avg / Min:	1.40
Guaranteed Max / Min:	**2.5**
Max / Min:	1.73
UG (adjacent pts):	0.00
CU:	0.71
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	B
No. of Luminaires:	**8**
Total Load:	4.32 kW

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 RP-6-15.

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

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

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	T3, T5	50'	-	50'	TLC-LED-550	4	2	2
1	T4	50'	-	50'	TLC-LED-550	2	2	0
1	T6	50'	-	50'	TLC-LED-550	4/4*	2	6
4	TOTALS					18	8	10

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

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 5-6**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	32.97
Maximum:	44
Minimum:	24
Avg / Min:	1.40
Guaranteed Max / Min:	**2.5**
Max / Min:	1.87
UG (adjacent pts):	0.00
CU:	0.74
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	C
No. of Luminaires:	**8**
Total Load:	4.32 kW

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 RP-6-15.

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

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

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	T5, T12	50'	-	50'	TLC-LED-550	4	2	2
1	T6	50'	-	50'	TLC-LED-550	4/4*	2	6
1	T11	50'	-	50'	TLC-LED-550	2	2	0
4	TOTALS					18	8	10

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

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 7-8**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	32.61
Maximum:	39
Minimum:	26
Avg / Min:	1.26
Guaranteed Max / Min:	**2.5**
Max / Min:	1.50
UG (adjacent pts):	0.00
CU:	0.73
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	D
No. of Luminaires:	**8**
Total Load:	4.32 kW

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 RP-6-15.

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

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

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
1	T6	50'	-	50'	TLC-LED-550	4/4*	2	6
2	T10, T12	50'	-	50'	TLC-LED-550	4	2	2
1	T13	50'	-	50'	TLC-LED-900	2	2	0
				50'	TLC-LED-550	2	0	2
4	TOTALS					20	8	12

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

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 9-10**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	31.40
Maximum:	40
Minimum:	25
Avg / Min:	1.27
Guaranteed Max / Min:	**2.5**
Max / Min:	1.63
UG (adjacent pts):	0.00
CU:	0.66
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	E
No. of Luminaires:	**8**
Total Load:	5.02 kW

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 RP-6-15.

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

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

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EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	T9, T14	50'	-	50'	TLC-LED-550	2	2	0
1	T10	50'	-	50'	TLC-LED-550	4	2	2
1	T13	50'	-	50'	TLC-LED-900	2	0	2
				50'	TLC-LED-550	2	2	0
4	TOTALS					12	8	4

SCALE IN FEET 1 : 40

0' 40' 80'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Tewinkle Park Tennis

Costa Mesa,CA

GRID SUMMARY

Name:	**Tennis 11-12**
Size:	2 Court - 12' Spacing
Spacing:	20.0' x 20.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY

MAINTAINED HORIZONTAL FOOTCANDLES

	Entire Grid
Guaranteed Average:	**30**
Scan Average:	30.35
Maximum:	38
Minimum:	20
Avg / Min:	1.48
Guaranteed Max / Min:	**2.5**
Max / Min:	1.87
UG (adjacent pts):	0.00
CU:	0.68
No. of Points:	30

LUMINAIRE INFORMATION

Applied Circuits:	F
No. of Luminaires:	**8**
Total Load:	4.32 kW

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 RP-6-15.

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

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

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SCALE IN FEET 1 : 100

0' 100' 200'

Tewinkle Park Tennis

Costa Mesa,CA

EQUIPMENT LAYOUT

INCLUDES:

· Tennis 1-2
· Tennis 11-12
· Tennis 3-4
· Tennis 5-6
· Tennis 7-8
· Tennis 9-10

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

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

EQUIPMENT LIST FOR AREAS SHOWN

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
6	T1, T4 T11, T14 T8-T9	50'	-	50'	TLC-LED-550	2
1	T6	50'	-	50'	TLC-LED-550	4/4*
6	T12 T2-T3, T5 T7, T10	50'	-	50'	TLC-LED-550	4
1	T13	50'	-	50' 50'	TLC-LED-900 TLC-LED-550	2 2
14	TOTALS					48

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

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Driver (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-LED-550	3.2	3.0	2.8	2.4	1.9	1.8	1.4
TLC-LED-900	5.3	5.0	4.6	4.0	3.2	2.9	2.3

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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System Requirements: Control System Summary

Project Name: Tewinkle Park Tennis | Project #: 215837
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Tennis

Preliminary Plans: Confirm all details - see Note 1

Project Information

Control System

Control System ID:	1 of 1
Control System Type:	Control-Link® Control and Monitoring System
Communication Type:	PowerLine-ST

Power Requirements

Control cabinet(s):	
Control voltage (phase to neutral)	120/60
VA loading - Inrush	6453.0
VA loading - Sealed	700.0
Lighting Circuits:	
Voltage/Hertz/Phase	240/60/1

Project Notes:

PRELIMINARY CONTROL SUMMARY

240V/1P, LED C&M, Powerline.

Equipment Listing

Description	Qty	Size (in)
Control and monitoring cabinet - primary	1	24 X 72
Control and monitoring cabinet - secondary	1	24 X 72

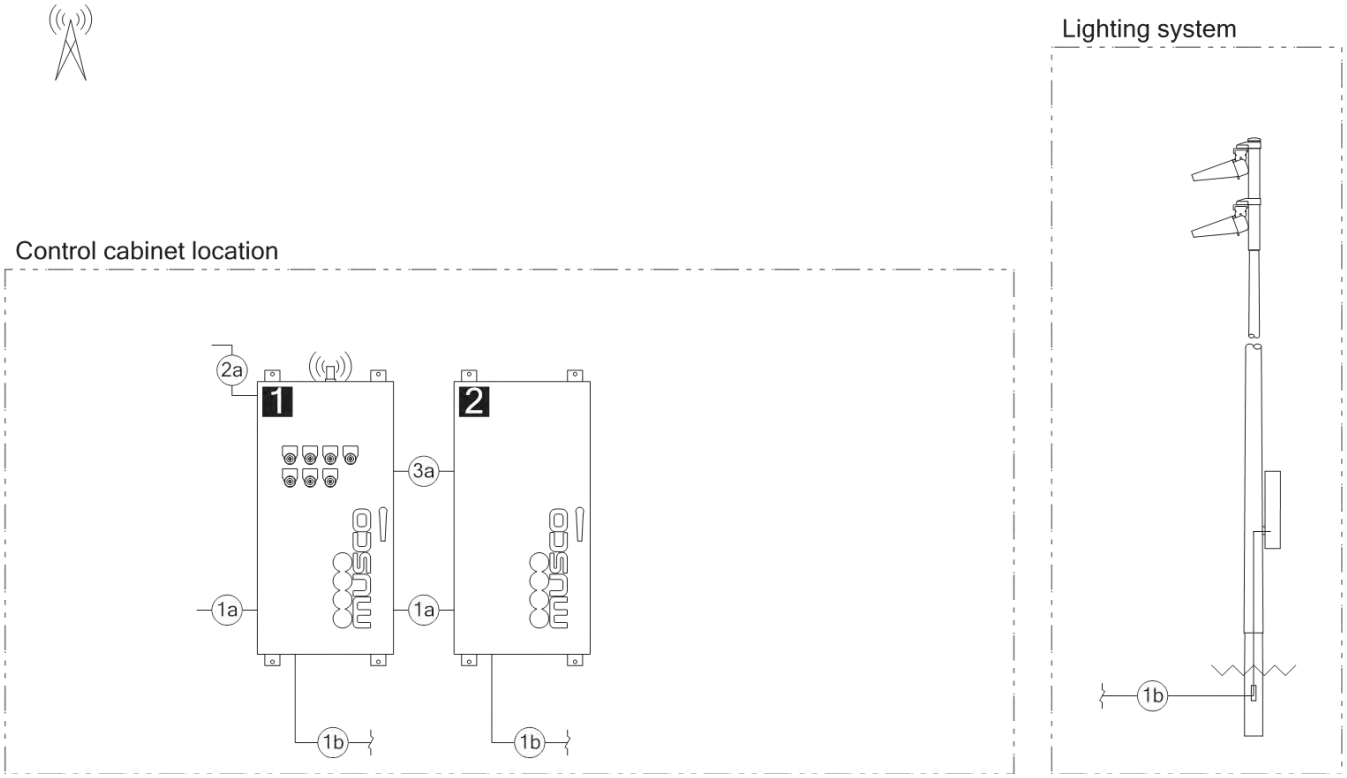
Important Notes:

1. Please confirm that the lighting circuit voltage listed above is accurate for this facility. This is the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole location. Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each circuit at each pole location. Contactors are 3 pole and 100% rated for the published continuous load.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. Size overcurrent devices using the full load amps column of the Circuit Summary by Switch chart (Minimum power factor is 0.9). Size conduit per code unless otherwise specified as larger to allow for harness connectors.
6. Avoid use of in-ground junction/pull boxes when possible. If used, all wire connectors must be UL listed for Wet Locations to prevent leakage current.
7. Control power wiring must be in separate conduit from line or load power wiring. Communication cables must be in separate conduit from any power wiring.
8. Refer to Installation Instructions for more details on equipment information and the installation requirements.

System Requirements: Control System Summary

Project Name: Tewinkle Park Tennis | Project #: 215837
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Tennis

Equipment Layout and Connection Details



Connection Details

ID	Description
1a	Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1b	Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
2a	Control power with equipment ground to control cabinet. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
3a	Control harnesses - Secondary cabinet to primary cabinet. Harness is provided by Musco in 8-foot length. Use minimum 2 inch diameter conduit for harness connector.

Equipment

ID	Description
1	Control and monitoring cabinet - primary
2	Control and monitoring cabinet - secondary

System Requirements: Control System Summary

Project Name: Tewinkle Park Tennis | Project #: 215837
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Tennis

Circuit Summary

Switching Schedule	
Field/Switch Description	**Switches**
Tennis 1-2	1
Tennis 3-4	2
Tennis 5-6	3
Tennis 7-8	4
Tennis 9-10	5
Tennis 11-12	6

Control Module ID: 1

Lighting Circuit Voltage: 240/60/1

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
1	Tennis 1-2	T1	2	5.54	30	1	C1
	Tennis 1-2	T2	2	5.54	30	1	C2
	Tennis 1-2	T7	2	5.54	30	1	C3
	Tennis 1-2	T8	2	5.54	30	1	C4
2	Tennis 3-4	T2	2	5.54	30	1	C5
	Tennis 3-4	T3	2	5.54	30	1	C6
	Tennis 3-4	T6	2	5.54	30	1	C7
	Tennis 3-4	T7	2	5.54	30	1	C8
3	Tennis 5-6	T3	2	5.54	30	1	C9
	Tennis 5-6	T4	2	5.54	30	1	C10
	Tennis 5-6	T5	2	5.54	30	1	C11
	Tennis 5-6	T6	2	5.54	30	1	C12
4	Tennis 7-8	T5	2	5.54	30	2	C13
	Tennis 7-8	T6	2	5.54	30	2	C14
	Tennis 7-8	T11	2	5.54	30	2	C15
	Tennis 7-8	T12	2	5.54	30	2	C16
5	Tennis 9-10	T6	2	5.54	30	2	C17
	Tennis 9-10	T10	2	5.54	30	2	C18
	Tennis 9-10	T12	2	5.54	30	2	C19
	Tennis 9-10	T13	2	9.16	30	2	C20
6	Tennis 11-12	T9	2	5.54	30	2	C21
	Tennis 11-12	T10	2	5.54	30	2	C22
	Tennis 11-12	T13	2	5.54	30	2	C23
	Tennis 11-12	T14	2	5.54	30	2	C24

LIGHTING SPECIFICATION
PREPARED FOR

Tewinkle Park Baseball Softball LED Relight

LED Lighting Project
Costa Mesa, CA
September 14, 2023

Project # 215836

SUBMITTED BY:

Musco Sports Lighting, LLC

2107 Stewart Road
PO Box 260
Muscatine, Iowa 52761
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SECTION 26 56 68 – EXTERIOR ATHLETIC LIGHTING

Lighting System with LED Light Source

PART 1 – GENERAL

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 these specifications is to define the lighting system performance and design standards for Tewinkle Park Baseball Softball LED Relight 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 venues:

1. Baseball
2. Softball A
3. Softball B
4. Softball C

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 to not drop below specified target values for a period of 25 years.
2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors.
3. Cost of Ownership: 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 for the duration of the warranty.
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. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

1.2 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Baseball	50fc infield/ 30fc Outfield	2:1 infield/ 2.5:1 Outfield	25 infield/ 109 outfield	30’ x 30’
Softball A	50fc infield/ 30fc Outfield	2:1 infield/ 2.5:1 Outfield	25 infield/ 119 outfield	20’ x 20’
Softball B	50fc infield/ 30fc Outfield	2:1 infield/ 2.5:1 Outfield	25 infield/ 146 outfield	20’ x 20’
Softball C	50fc infield/ 30fc Outfield	2:1 infield/ 2.5:1 Outfield	25 infield/ 132 outfield	20’ x 20’

B. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75.

C. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
16	A1-A4, B1-B4, C1- C8	80’

1.3 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

B. Spill Light and Glare Control: To minimize impact on adjacent properties, spill light and candela values must not exceed the following levels taken at 3 feet above grade.

	Average	Maximum
Entire Grid Specified Spill Line Horizontal Footcandles	0.025 fc	0.10 fc
Entire Grid Specified Spill Line Max Vertical Footcandles	0.076 fc	0.30 fc

C. Spill Scans: Spill scans must be submitted indicating the amount of horizontal and vertical footcandles along the specified lines. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights. Illumination level shall be measured in accordance with the IESNA LM-5-04 after 1 hour warm up.

D. The first page of a photometric report for all luminaire types proposed showing horizontal and vertical axial candle power shall be provided to demonstrate the capability of achieving the specified performance. Reports shall be certified by a qualified testing laboratory with a minimum of five years experience or by a manufacturer’s laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products. A summary of the horizontal and vertical aiming angles for each luminaire shall be included with the photometric report.

1.4 Cost of Ownership

A. Manufacturer shall submit a 25 year Cost of Ownership summary that includes energy consumption, anticipated maintenance costs, and control costs. All costs associated with faulty luminaire replacement - equipment rentals, removal and installation labor, and shipping - are to be included in the maintenance costs.

PART 2 – PRODUCT

2.2 SPORTS LIGHTING SYSTEM CONSTRUCTION

A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.

B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance polyester or anodized.

All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

C. System Description: Lighting system shall consist of the following:

1. Galvanized steel poles and cross-arm assembly.
2. Non-approved pole technology:
    a. Square static cast concrete poles will not be accepted.
    b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
3. Lighting systems shall use concrete foundations. See Section 2.4 for details.
    a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or re-inforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
4. Manufacturer will supply all drivers and supporting electrical equipment
    a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure. Integral drivers are not allowed.
    b. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2_2002.
5. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
6. All luminaires, visors, and cross-arm assemblies shall withstand 150 mi/h winds and maintain luminaire aiming alignment.
7. Control cabinet to provide remote on-off control, monitoring, and entertainment features of the lighting system. See Section 2.3 for further details.
8. Contactor cabinet to provide on-off control.
9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
    a. Integrated grounding via concrete encased electrode grounding system.
    b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780.The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

10. Enhanced corrosion protection package: Due to the potentially corrosive environment for this project, manufacturers must provide documentation that their products meet the following enhanced requirements in addition to the standard durability protection specified above:
    a) Exposed carbon steel horizontal surfaces on the crossarm assembly shall be galvanized to no less than a five (5) mil average thickness.
    b) Exposed die cast aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.
    c) Exposed extruded aluminum components shall be Type II anodized per MIL-STD-8625 and coated with high performance polyester.

D. Safety: All system components shall be UL listed for the appropriate application.

2.2 ELECTRICAL

A. Electric Power Requirements for the Sports Lighting Equipment:
   1. Electric power: 480 Volt, 3 Phase
   2. Maximum total voltage drop: Voltage dr3op to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.

B. Energy Consumption: The kW consumption for the field lighting system shall be 133.32 kW.

2.3 CONTROL

A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.

B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.

C. 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. Scheduling tool shall be capable of setting curfew limits.

   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.

D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).

E. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

   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. Report hours saved by using early off and push buttons by users.

F. Communication Costs: Manufacturer shall include communication costs for operating the control and monitoring system for a period of 25 years.

G. Communication with luminaire drivers: Control system shall interface with drivers in electrical

components enclosures by means of powerline communication .

2.4 STRUCTURAL PARAMETERS

A. Wind Loads: Wind loads shall be based on the 2019 California Building Code. Wind loads to be calculated using ASCE 7-16, a design wind speed of 95mi/h, 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. If no geotechnical report is available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2016 CBC Table 1806.2.

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. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:

1. Providing engineered foundation embedment design by a registered engineer in the State of CA for soils other than specified soil conditions;
2. Additional materials required to achieve alternate foundation;
3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

3.2 DELIVERY TIMING

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of approved submittals and receipt of complete order information.

3.3 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. Field Light Level Accountability

1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 years. These levels will be specifically stated as "guaranteed" on the illumination summary provided by the manufacturer.
2. The contractor/manufacturer shall be responsible for conducting initial light level testing and an additional inspection of the system, in the presence of the owner, one year from the date of commissioning of the lighting.
3. The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

3.4 WARRANTY AND GUARANTEE

A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for

25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.

B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Manufacturer is responsible for removal and replacement of failed luminaires, including all parts, labor, shipping, and equipment rental associated with maintenance. Owner agrees to check fuses in the event of a luminaire outage.

PART 4 – DESIGN APPROVAL

4.0 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.0.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.

B. Approved Product: Musco's Light-Structure System™ with TLC for LED™ is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.

C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.

D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. ***Submit checklist below with submittal.***

Yes/ No	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 b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x & y), Illuminance levels at grid spacing specified c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, 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 foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.
	D	Off Field Lighting Design	Lighting design drawing showing initial spill light levels along the boundary line (defined on bid drawings) in footcandles. Lighting design showing glare along the boundary line in candela. Light levels shall be taken at 30-foot intervals along the boundary line. Readings shall be taken with the meter orientation at both horizontal and aimed towards the most intense bank of lights.
	E	Photometric Report	Provide first page of photometric report for all luminaire types being proposed 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.
	F	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 to not fall below target levels for warranty period.
	G	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 CA, if required by owner. (May be supplied upon award).
	H	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system and entertainment packages. They will also provide ten (10) references of customers currently using proposed system in the state of CA.
	I	Electrical Distribution Plans	Manufacturer bidding an alternate product 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 CA.
	J	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of CA.
	K	Project References	Manufacturer to provide a list of five (5) projects where the technology and specific fixture proposed for this project has been installed in the state of CA. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
	L	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.

	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
	N	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 Tewinkle Park Baseball Softball LED Relight. 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:** _____/_____/_____

Contractor: _____ **Signature:** _____

Tewinkle Park Baseball Softball LED Retrofit
Costa Mesa, CA
Retrofit System Scope of Work

Customer Responsibilities:

1. Complete access to the site for construction using standard 2-wheel drive rubber tire equipment.
2. Locate existing underground utilities not covered by your local utilities. (i.e. water lines, electrical lines, irrigation systems, and sprinkler heads). Musco or Subcontractor will not be responsible for repairs to unmarked utilities.
3. Locate and mark field reference points per Musco supplied layout. (i.e. home plate, center of FB field).
4. If existing underground wiring is being used ensure usability.
5. Pay any necessary power company fees and requirements.
6. Pay all permitting fees.
7. Provide any existing as-built documents or drawings.
8. Provide sealed Electrical Plans. (If required)

Musco Responsibilities:

1. Provide required fixtures, electrical enclosures, mounts, hardware, wire harnesses, and control cabinets.
2. Provide poletop luminaire assembly on all poles.
3. Provide fixture layout and aiming diagram.

Contractor Responsibilities

General:

1. Obtain any required permitting.
2. Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
3. Contact the facility owner/manager to confirm the existing private underground utilities and irrigation systems have been located and are clearly marked to avoid damage from construction equipment. Notify owner and repair damage to marked utilities. Notify owner and Musco regarding damage which occurred to unmarked utilities.
4. Provide labor, equipment, and materials to off load equipment at jobsite per scheduled delivery.
5. Provide storage containers for material, (including electrical components enclosures), as needed.
6. Provide necessary waste disposal and daily cleanup.
7. Provide adequate security to protect Musco delivered products from theft, vandalism, or damage during the installation.
8. Keep all heavy equipment off playing fields when possible. Repair damage to grounds which exceeds that which would be expected. Indentations caused by heavy equipment traveling over dry ground would be an example of expected damage. Ruts and sod damage caused by equipment traveling over wet grounds would be an example of damage requiring repair.
9. Provide startup and aiming as required to provide complete and operating sports lighting system.
10. Installation to commence upon delivery and proceed without interruption until complete. Musco to be immediately notified of any breaks in schedule or delays.

Retrofit Musco Equipment to Existing Poles:

1. Provide labor, materials, and equipment to assemble and install Musco TLC for LED® equipment on existing poles and terminate grounding and power feed. Power feed may need to be reworked to adapt to the new Musco equipment.
2. Ensure grounding components meet minimum standards required by NEC and NFPA780.
3. For concrete poles provide new lightning down conductor(aluminum) and $^{5}/_{8}$ in copper ground rod. For poles 75 ft (22 m) or less use 1/0 AWG, poles over 75 ft (22 m) use 4/0 AWG conductor. Bond internal pole ground to new down conductor.
4. For steel poles provide new ground rod and pole bonding conductor per NFPA Annex A.1.6.
5. Down conductor shall be converted to copper wire for any underground runs and bonded to ground rod(s).
6. Ensure all Musco components are bonded to both equipment and lightning grounds. No upward sweeps allowed for lightning down conductor or bonding jumper(s). See installation instructions for further information.
7. Test ground resistance with 3-point megger and confirm 25 ohms or less for each pole. Install additional ground rods or create grounding grid until resistance of 25 ohms or less is achieved.

CODE OF CONDUCT

In order to maintain a high-quality jobsite and installation, Subcontractor represents to Musco that it has the supervision necessary to, and shall train, manage, supervise, monitor, and inspect the activities of its employees for the purpose of enforcing compliance with these safety requirements. Subcontractor acknowledges that Musco does not undertake any duty toward Subcontractor's employees to train, manage, supervise, monitor, and inspect their work activities for the purpose of enforcing compliance with these safety requirements, but Subcontractor agrees to abide by any reasonable recommendations made by Musco or Musco representatives with respect to safety.

Subcontractor agrees that it is or will be familiar with and shall abide by the safety rules and regulations of Musco and the Owner, including, but not limited to the Occupational Safety and Health Act of 1970 (OSHA), all rules and regulations established pursuant thereto, and all amendments and supplements thereto.

Subcontractor further agrees to require all its employees, subcontractors, and suppliers to comply with these requirements. Subcontractor shall also observe and comply with all laws with respect to environmental protection applicable to the Project.

Subcontractor shall require all its subcontractors, employees, visitors, suppliers, and agents under its direction to comply with the following:

1. GENERAL JOBSITE SAFETY AND CLEANLINESS.
   a. Subcontractor's employees and agents shall be required to wear appropriate personal protective equipment including, but not limited to, safety glasses with side shields, work shoes, fall protection devices, and hard hats.
   b. Where a walking or working surface has an unprotected side or edge which is six feet or more above a lower level, Subcontractor shall use guardrail systems, safety net systems, or personal fall arrest systems.
   c. Jobsite shall be kept free of debris including, but not limited to, cardboard and packing materials which can become windborne.
   d. Construction equipment shall be parked during non-use in an orderly fashion so as not to create inconvenience to others using the jobsite.
   e. Subcontractor shall provide for and ensure the use of safety equipment for the Project in accordance with Musco's and Owner's safety requirements, to the extent these may be stricter than federal, state, or local standards, or generally recognized industry applicable standards.
   f. Subcontractor shall provide the Musco project manager with an "Emergency List" showing Subcontractor's designated medical doctor, hospital, insurance company, and any other health service providers, such list to be updated within 24 hours of any change in the information provided.
   g. Within eight (8) hours from the time of an accident (or such shorter period as laws may require), Subcontractor shall advise Musco of any accident resulting in injury to any person or damage to any equipment or facility. Upon request, Subcontractor shall promptly furnish Musco with a written report of any such accident as well as a copy of all insurance and worker's compensation claims involving the Project.
   h. Subcontractor shall maintain and inspect all construction equipment, including cranes and other lifting equipment, prior to each use. Subcontractor warrants that all equipment operators shall be qualified for each piece of construction equipment they intend to operate. Documentation of specific training is the responsibility of the Subcontractor.
   i. Jobsite shall be policed daily for compliance to the above conditions.

j. Subcontractor's employees and agents are prohibited from using drugs and alcohol on the Project property or being under the influence of alcohol or drugs while performing work on the Project. Anyone observed participating in or observed under the influence will be removed from the Project immediately and prohibited from returning, with no exceptions.

2. CONFORMANCE TO STANDARD MUSCO INSTALLATION GUIDELINES.
   a. Review and understand installation instructions are provided with every product installation.
   b. Education of installation personnel to allow for highest efficiency and lowest possibility of failure.
   c. Verify that components have been assembled per Musco installation instructions.
   d. Verify plumb of concrete foundations prior to standing of poles.

3. PROVIDING A QUALITY INSTALLATION TEAM.
   a. Subcontractor's work directly reflects the quality of the installation and may indirectly relate to the quality of the product upon which Musco's reputation is built.
   b. Provide and maintain quality installation equipment. Records of maintenance and/or calibration shall be provided upon request.
   c. Personnel shall be knowledgeable in operation of equipment as well as installation of Musco product.
   d. All personnel provided by Subcontractor shall understand the relationship developed by and between Subcontractor and Musco, also by and between Musco and the customer, and act accordingly.

Terwinkle Park LED Retrofit

Lighting System

Pole/Fixture Summary

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1	70'	71'	2	TLC-LED-1200	2.34 kW	B
		71'	1	TLC-LED-900	0.88 kW	B
		16'	1	TLC-BT-575	0.57 kW	B
A1-A2	70'	71'	1	TLC-LED-900	0.88 kW	A
		71'	3	TLC-LED-1200	3.51 kW	A
		16'	1	TLC-BT-575	0.57 kW	A
A2	70'	71'	1	TLC-LED-1500	1.41 kW	D
		71'	1	TLC-LED-900	0.88 kW	D
		71'	1	TLC-LED-1200	1.17 kW	D
		16'	1	TLC-BT-575	0.57 kW	D
A3	80'	81'	1	TLC-LED-1200	1.17 kW	D
		81'	1	TLC-LED-1500	1.41 kW	D
		81'	1	TLC-LED-900	0.88 kW	D
		16'	1	TLC-BT-575	0.57 kW	D
A3-A4	80'	81'	1	TLC-LED-1200	1.17 kW	C
		16'	1	TLC-BT-575	0.57 kW	C
		81'	2	TLC-LED-900	1.76 kW	C
A4	80'	16'	1	TLC-BT-575	0.57 kW	B
		81'	1	TLC-LED-900	0.88 kW	B
		81'	2	TLC-LED-1200	2.34 kW	B
B1 B4	80'	81'	4	TLC-LED-1200	4.68 kW	B
		16'	1	TLC-BT-575	0.57 kW	B
B1-B2	80'	81'	2	TLC-LED-1200	2.34 kW	A
		81'	3	TLC-LED-1500	4.23 kW	A
		16'	1	TLC-BT-575	0.57 kW	A
B2	80'	81'	4	TLC-LED-1200	4.68 kW	D
B2-B3	80'	18'	1	TLC-BT-575	0.57 kW	D
B3	80'	81'	1	TLC-LED-1500	1.41 kW	D
		81'	3	TLC-LED-1200	3.51 kW	D
		16'	1	TLC-BT-575	0.57 kW	C
B3-B4	80'	81'	5	TLC-LED-1200	5.85 kW	C
B4	80'	18'	1	TLC-BT-575	0.57 kW	C
C1-C2	80'	81'	3	TLC-LED-1200	3.51 kW	A
		81'	4	TLC-LED-1500	5.64 kW	A
		16'	2	TLC-BT-575	1.15 kW	A
C3	80'	81'	3	TLC-LED-1200	3.51 kW	D
C3-C4	80'	81'	1	TLC-LED-900	0.88 kW	D
		16'	2	TLC-BT-575	1.15 kW	D
C4	80'	81'	1	TLC-LED-1500	1.41 kW	D
		81'	2	TLC-LED-1200	2.34 kW	D
C5-C6	80'	16'	2	TLC-BT-575	1.15 kW	C
		81'	4	TLC-LED-1200	4.68 kW	C
C7-C8	80'	81'	1	TLC-LED-900	0.88 kW	B
		81'	2	TLC-LED-1200	2.34 kW	B
		16'	2	TLC-BT-575	1.15 kW	B
16			**130**		**133.32 kW**	

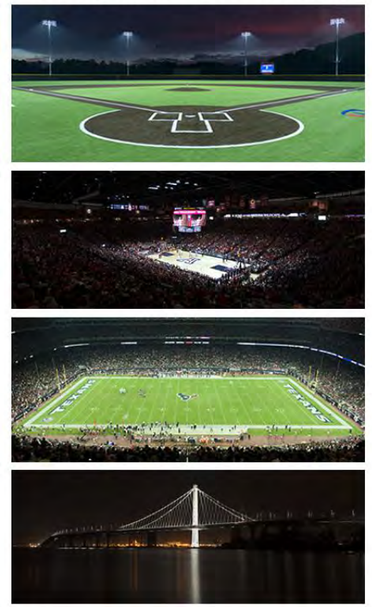
Circuit Summary

Circuit	Description	Load	Fixture Qty
A	Baseball	44.82 kW	40
B	Softball A	26.84 kW	28
C	Softball B	31.52 kW	32
D	Softball C	30.14 kW	30

Fixture Type Summary

Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-BT-575	LED 5700K - 75 CRI	575W	52,000	>120,000	>120,000	>120,000	32
TLC-LED-1200	LED 5700K - 75 CRI	1170W	150,000	>120,000	>120,000	>120,000	66
TLC-LED-1500	LED 5700K - 75 CRI	1410W	181,000	>120,000	>120,000	>120,000	18
TLC-LED-900	LED 5700K - 75 CRI	880W	104,000	>120,000	>120,000	>120,000	14

From Hometown to Professional



We Make It Happen.

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Terwinkle Park LED Retrofit

Single Luminaire Amperage Draw Chart

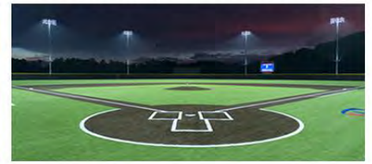
Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-BT-575	3.3	3.2	2.9	2.5	2.0	1.8	1.5
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3

Light Level Summary

Calculation Grid Summary

Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
		Ave	Min	Max	Max/Min	Ave/Min		
Baseball (Infield)	Horizontal Illuminance	51.3	38	63	1.68	1.35	A	40
Baseball (Outfield)	Horizontal Illuminance	30.3	22	44	1.97	1.38	A	40
Softball A (Infield)	Horizontal Illuminance	50.3	42	60	1.42	1.20	B	28
Softball A (Outfield)	Horizontal Illuminance	30.8	21	42	2.00	1.47	B	28
Softball B (Infield)	Horizontal Illuminance	51.1	40	63	1.58	1.28	C	32
Softball B (Outfield)	Horizontal Illuminance	32	21	46	2.17	1.52	C	32
Softball C (Infield)	Horizontal Illuminance	50.3	40	60	1.52	1.26	D	30
Softball C (Outfield)	Horizontal Illuminance	31.7	20	44	2.14	1.58	D	30
Spill	Horizontal	0.02	0	0.13	0.00		A,B,C,D	130
Spill	Max Candela (by Fixture)	3514	0.86	15203	17696.67	4086.59	A,B,C,D	130
Spill	Max Vertical Illuminance Metric	0.06	0	0.31	0.00		A,B,C,D	130

From Hometown to Professional



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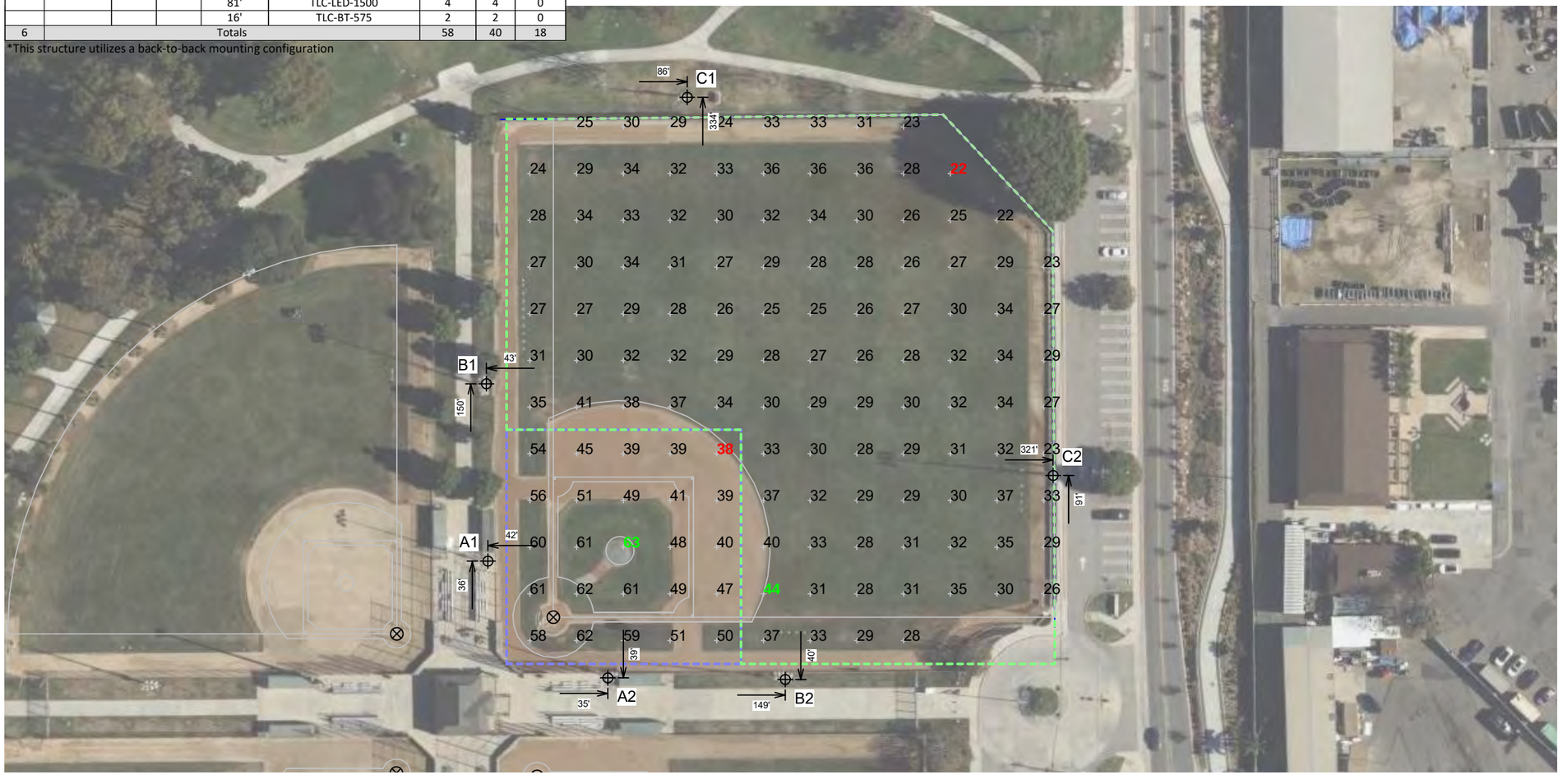
Terwinkle Park LED Retrofit

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A1	70'	1'	71'	TLC-LED-1200	3/2*	3	2
				71'	TLC-LED-900	1/1*	1	1
				16'	TLC-BT-575	2	1	1
1	A2	70'	1'	71'	TLC-LED-1200	3/1*	3	1
				71'	TLC-LED-1500	1*	0	1
				71'	TLC-LED-900	1/1*	1	1
				16'	TLC-BT-575	2	1	1
1	B1	80'	1'	81'	TLC-LED-1200	2/4*	2	4
				81'	TLC-LED-1500	3	3	0
				16'	TLC-BT-575	2	1	1
1	B2	80'	1'	81'	TLC-LED-1200	2/4*	2	4
				81'	TLC-LED-1500	3	3	0
				18'	TLC-BT-575	1	0	1
				16'	TLC-BT-575	1	1	0
2	C1-C2	80'	1'	81'	TLC-LED-1200	3	3	0
				81'	TLC-LED-1500	4	4	0
				16'	TLC-BT-575	2	2	0
6	Totals					58	40	18

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



Grid Summary

Name	**Baseball**
Size	Irregular 320'/404'/322'
Spacing	30.0' x 30.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Infield	Outfield
Guaranteed Average	**50**	**30**
Scan Average	51.35	30.31
Maximum	63	44
Minimum	38	22
Avg/Min	1.37	1.37
Guaranteed Max/Min	**2**	**2.5**
Max/Min	1.68	1.97
UG (adjacent pts)	1.31	1.42
CU	0.73	
No. of Points	25	109
LUMINAIRE INFORMATION		
Applied Circuits	A	
No. of Luminaires	**40**	
Total Load	44.82 kW	

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

ENGINEERED DESIGN By: E.Gray • File #215836B • 28-Aug-23

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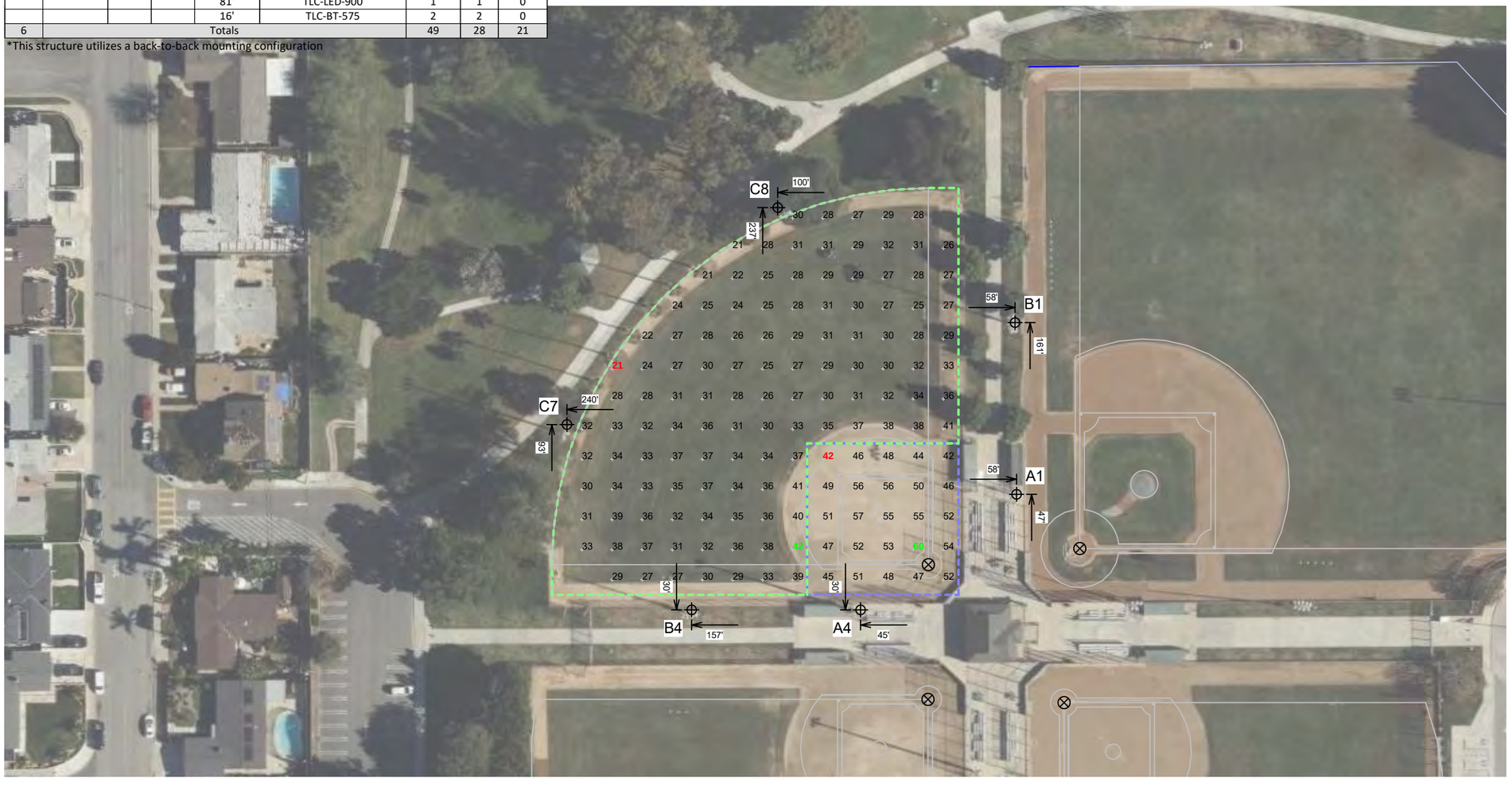
Terwinkle Park LED Retrofit

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A1	70'	1'	71'	TLC-LED-1200	3/2*	2	3
				71'	TLC-LED-900	1/1*	1	1
				16'	TLC-BT-575	2	1	1
1	A4	80'	1'	81'	TLC-LED-1200	2/1*	2	1
				81'	TLC-LED-900	1/2*	1	2
				16'	TLC-BT-575	2	1	1
1	B1	80'	1'	81'	TLC-LED-1200	2/4*	4	2
				81'	TLC-LED-1500	3	0	3
				16'	TLC-BT-575	2	1	1
1	B4	80'	1'	81'	TLC-LED-1200	4/5*	4	5
				18'	TLC-BT-575	1	0	1
				16'	TLC-BT-575	1	1	0
2	C7-C8	80'	1'	81'	TLC-LED-1200	2	2	0
				81'	TLC-LED-900	1	1	0
				16'	TLC-BT-575	2	2	0
6	Totals					49	28	21

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



Grid Summary

Name	**Softball A**
Size	250'/250'/250' - basepath 60'
Spacing	20.0' x 20.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Infield	Outfield
Guaranteed Average	**50**	**30**
Scan Average	50.29	30.83
Maximum	60	42
Minimum	42	21
Avg/Min	1.20	1.48
Guaranteed Max/Min	**2**	**2.5**
Max/Min	1.42	2.00
UG (adjacent pts)	1.28	1.37
CU	0.61	
No. of Points	25	119
LUMINAIRE INFORMATION		
Applied Circuits	B	
No. of Luminaires	**28**	
Total Load	26.84 kW	

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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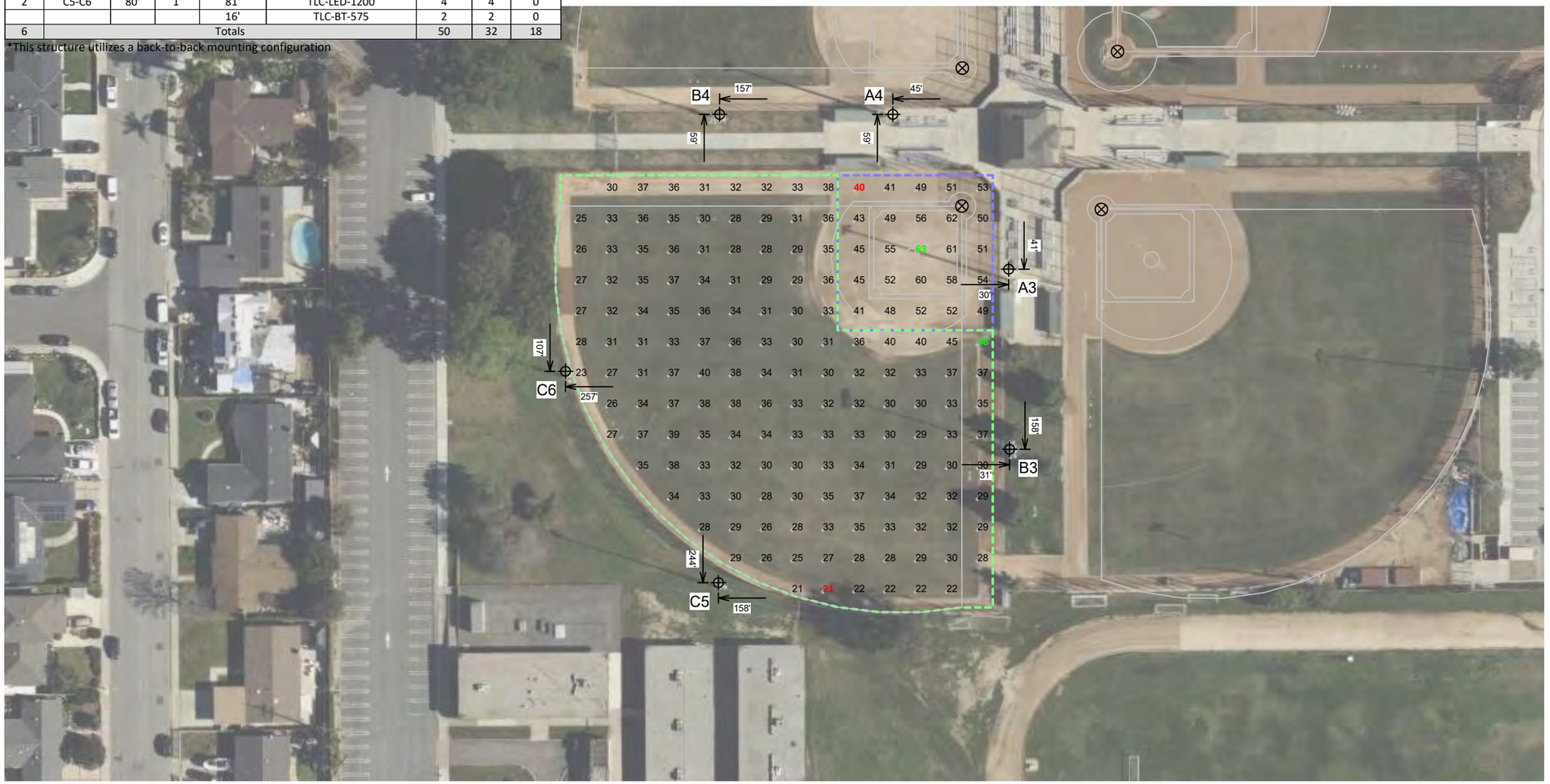
Terwinkle Park LED Retrofit

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A3	80'	1'	81'	TLC-LED-1200	1/1*	1	1
				81'	TLC-LED-1500	1*	0	1
				81'	TLC-LED-900	2/1*	2	1
				16'	TLC-BT-575	2	1	1
1	A4	80'	1'	81'	TLC-LED-1200	2/1*	1	2
				81'	TLC-LED-900	1/2*	2	1
				16'	TLC-BT-575	2	1	1
1	B3	80'	1'	81'	TLC-LED-1200	5/3*	5	3
				81'	TLC-LED-1500	1*	0	1
				18'	TLC-BT-575	1	0	1
				16'	TLC-BT-575	1	1	0
1	B4	80'	1'	81'	TLC-LED-1200	4/5*	5	4
				18'	TLC-BT-575	1	1	0
				16'	TLC-BT-575	1	0	1
2	C5-C6	80'	1'	81'	TLC-LED-1200	4	4	0
				16'	TLC-BT-575	2	2	0
6	Totals					50	32	18

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



Grid Summary

Name	**Softball B**
Size	260'/280'/260' - basepath 60'
Spacing	20.0' x 20.0'
Height	3.0' above grade

Illumination Summary

MAINTAINED HORIZONTAL FOOTCANDLES

	Infield	Outfield
Guaranteed Average	**50**	**30**
Scan Average	51.11	31.95
Maximum	63	46
Minimum	40	21
Avg/Min	1.28	1.52
Guaranteed Max/Min	**2**	**2.5**
Max/Min	1.58	2.17
UG (adjacent pts)	1.23	1.40
CU	0.62	
No. of Points	25	146
LUMINAIRE INFORMATION		
Applied Circuits	C	
No. of Luminaires	**32**	
Total Load	31.52 kW	

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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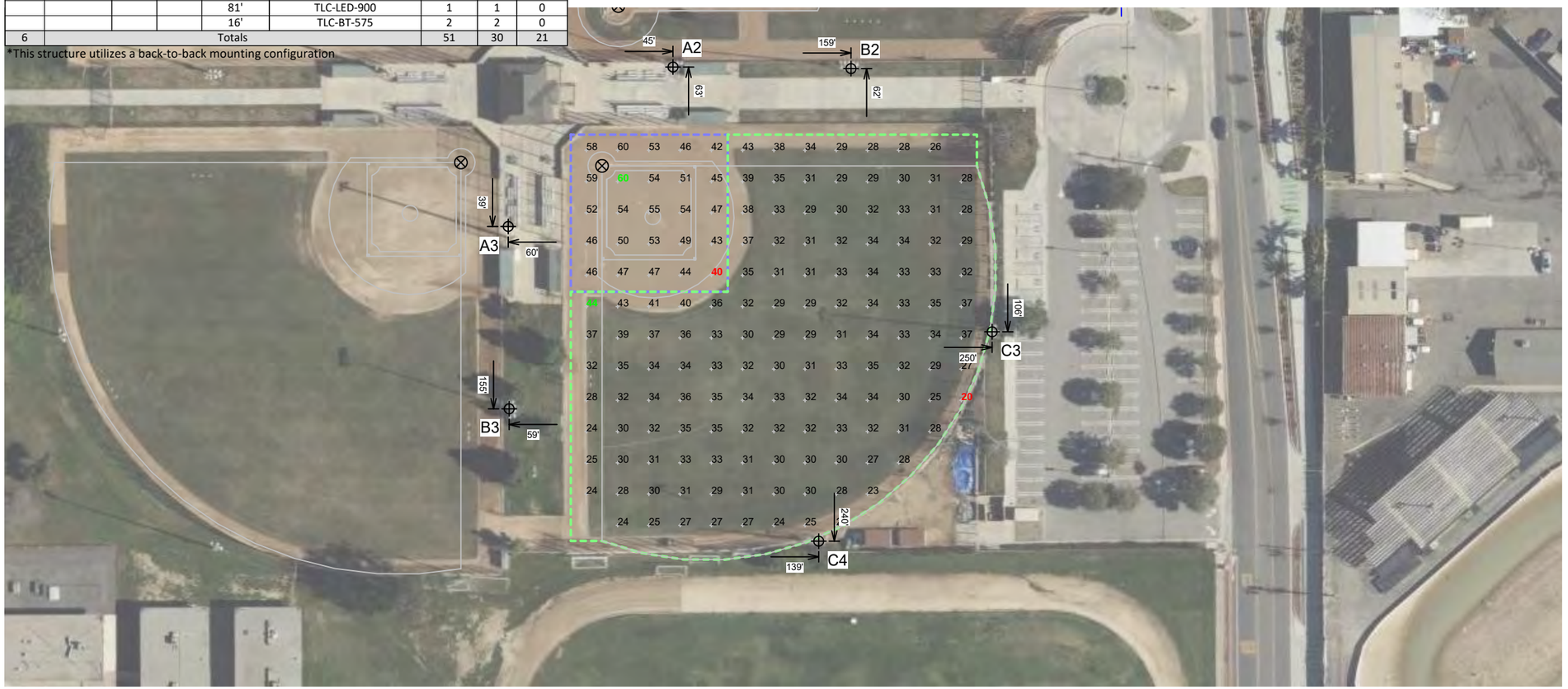
Terwinkle Park LED Retrofit

Equipment List For Areas Shown

Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS
1	A2	70'	1'	71'	TLC-LED-1200	3/1*	1	3
				71'	TLC-LED-1500	1*	1	0
				71'	TLC-LED-900	1/1*	1	1
				16'	TLC-BT-575	2	1	1
1	A3	80'	1'	81'	TLC-LED-1200	1/1*	1	1
				81'	TLC-LED-1500	1*	1	0
				81'	TLC-LED-900	2/1*	1	2
				16'	TLC-BT-575	2	1	1
1	B2	80'	1'	81'	TLC-LED-1200	2/4*	4	2
				81'	TLC-LED-1500	3	0	3
				18'	TLC-BT-575	1	1	0
				16'	TLC-BT-575	1	0	1
1	B3	80'	1'	81'	TLC-LED-1200	5/3*	3	5
				81'	TLC-LED-1500	1*	1	0
				18'	TLC-BT-575	1	1	0
				16'	TLC-BT-575	1	0	1
1	C3	80'	1'	81'	TLC-LED-1200	3	3	0
				81'	TLC-LED-900	1	1	0
				16'	TLC-BT-575	2	2	0
1	C4	80'	1'	81'	TLC-LED-1200	2	2	0
				81'	TLC-LED-1500	1	1	0
				81'	TLC-LED-900	1	1	0
				16'	TLC-BT-575	2	2	0
6	Totals					51	30	21

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



Grid Summary

Name	**Softball C**
Size	240'/280'/240' - basepath 60'
Spacing	20.0' x 20.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES	
	Infield	Outfield
Guaranteed Average	**50**	**30**
Scan Average	50.28	31.67
Maximum	60	44
Minimum	40	20
Avg/Min	1.27	1.55
Guaranteed Max/Min	**2**	**2.5**
Max/Min	1.52	2.14
UG (adjacent pts)	1.17	1.36
CU	0.59	
No. of Points	25	132
LUMINAIRE INFORMATION		
Applied Circuits	D	
No. of Luminaires	**30**	
Total Load	30.14 kW	

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 RP-6-15.

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

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

SCALE IN FEET 1 : 80

0' 80' 160'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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Terwinkle Park LED Retrofit

Grid Summary

Name	**Spill**
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED HORIZONTAL FOOTCANDLES
	Entire Grid
Scan Average	**0.0212**
Maximum	0.13
Minimum	0.00
CU	0.00
No. of Points	46
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D
No. of Luminaires	**130**
Total Load	133.32 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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Terwinkle Park LED Retrofit

Grid Summary

Name	**Spill**
Spacing	30.0' x 10.0'
Height	3.0' above grade

Illumination Summary

	MAINTAINED MAX VERTICAL FOOTCANDLES
	Entire Grid
Scan Average	**0.0635**
Maximum	0.31
Minimum	0.00
CU	0.00
No. of Points	46
LUMINAIRE INFORMATION	
Applied Circuits	A,B,C,D
No. of Luminaires	**130**
Total Load	133.32 kW

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 RP-6-15.

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

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

SCALE IN FEET 1 : 200

0' 200' 400'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

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ATTACHMENT 2

Terwinkle Park LED Retrofit

Equipment Layout

INCLUDES:
· Baseball
· Softball A
· Softball B
· Softball C

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

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

Equipment List For Areas Shown

Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE
1	A1	70'	1'	71'	TLC-LED-900	1/1*
				71'	TLC-LED-1200	3/2*
				16'	TLC-BT-575	2
1	A2	70'	1'	71'	TLC-LED-1500	1*
				71'	TLC-LED-900	1/1*
				16'	TLC-BT-575	2
				71'	TLC-LED-1200	3/1*
1	A3	80'	1'	81'	TLC-LED-1500	1*
				81'	TLC-LED-900	2/1*
				16'	TLC-BT-575	2
				81'	TLC-LED-1200	1/1*
1	A4	80'	1'	81'	TLC-LED-900	1/2*
				16'	TLC-BT-575	2
				81'	TLC-LED-1200	2/1*
1	B1	80'	1'	81'	TLC-LED-1200	2/4*
				81'	TLC-LED-1500	3
				16'	TLC-BT-575	2
1	B2	80'	1'	81'	TLC-LED-1200	2/4*
				81'	TLC-LED-1500	3
				18'	TLC-BT-575	1
				16'	TLC-BT-575	1
1	B3	80'	1'	81'	TLC-LED-1200	5/3*
				81'	TLC-LED-1500	1*
				18'	TLC-BT-575	1
				16'	TLC-BT-575	1
1	B4	80'	1'	81'	TLC-LED-1200	4/5*
				18'	TLC-BT-575	1
				16'	TLC-BT-575	1
2	C1-C2	80'	1'	81'	TLC-LED-1200	3
				81'	TLC-LED-1500	4
				16'	TLC-BT-575	2
1	C3	80'	1'	81'	TLC-LED-900	1
				16'	TLC-BT-575	2
				81'	TLC-LED-1200	3
1	C4	80'	1'	81'	TLC-LED-1200	2
				81'	TLC-LED-1500	1
				81'	TLC-LED-900	1
				16'	TLC-BT-575	2
2	C5-C6	80'	1'	81'	TLC-LED-1200	4
				16'	TLC-BT-575	2
2	C7-C8	80'	1'	81'	TLC-LED-1200	2
				81'	TLC-LED-900	1
				16'	TLC-BT-575	2
16	Totals					130

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

Single Luminaire Amperage Draw Chart

Driver Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
Single Phase Voltage	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
TLC-BT-575	3.3	3.2	2.9	2.5	2.0	1.8	1.5
TLC-LED-1200	6.9	6.5	6.0	5.2	4.2	3.8	3.0
TLC-LED-1500	8.4	7.9	7.3	6.3	5.0	4.6	3.6
TLC-LED-900	5.2	4.9	4.5	3.9	3.1	2.9	2.3

SCALE IN FEET 1 : 100

0' 100' 200'

Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊗

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System Requirements: Control System Summary

Project Name: Tewinkle Park Baseball Softball LED Relight | Project #: 215836
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Baseball Softball

Project Information

Control System

Control System ID:	1 of 1
Control System Type:	Control-Link® Control and Monitoring System
Communication Type:	PowerLine-ST

Power Requirements

Control cabinet(s):	
Control voltage (phase to neutral)	120/60
VA loading - Inrush	6453.0
VA loading - Sealed	700.0
Lighting Circuits:	
Voltage/Hertz/Phase	480/60/3

Project Notes:

PRELIMINARY CONTROL SUMMARY

480V/3P, LED C&M, Powerline.

Equipment Listing

Description	Qty	Size (in)
Control and monitoring cabinet - primary	1	24 X 72
Control and monitoring cabinet - secondary	1	24 X 72

Preliminary Plans: Confirm all details - see Note 1

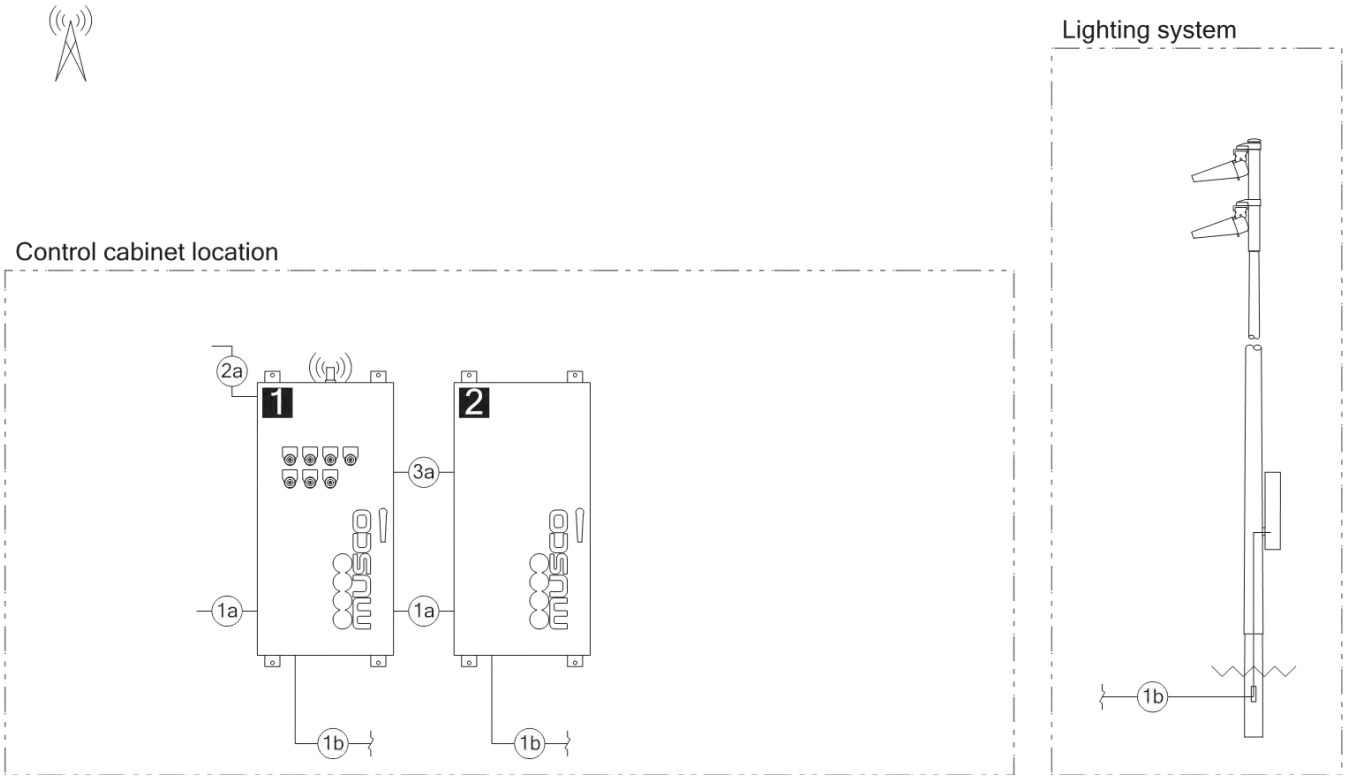
Important Notes:

1. Please confirm that the lighting circuit voltage listed above is accurate for this facility. This is the voltage/phase being connected and utilized at each lighting pole's electrical components enclosure disconnect. Inaccurate voltage/phase can result in additional costs and delays. Contact your Musco sales representative to confirm this item.
2. In a 3 phase design, all 3 phases are to be run to each pole location. Musco's single phase luminaires come pre-wired to utilize all 3 phases across the entire facility.
3. One contactor is required for each circuit at each pole location. Contactors are 3 pole and 100% rated for the published continuous load.
4. If the lighting system will be fed from more than one distribution location, additional equipment may be required. Contact your Musco sales representative.
5. Size overcurrent devices using the full load amps column of the Circuit Summary by Switch chart (Minimum power factor is 0.9). Size conduit per code unless otherwise specified as larger to allow for harness connectors.
6. Avoid use of in-ground junction/pull boxes when possible. If used, all wire connectors must be UL listed for Wet Locations to prevent leakage current.
7. Control power wiring must be in separate conduit from line or load power wiring. Communication cables must be in separate conduit from any power wiring.
8. Refer to Installation Instructions for more details on equipment information and the installation requirements.

System Requirements: Control System Summary

Project Name: Tewinkle Park Baseball Softball LED Relight | Project #: 215836
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Baseball Softball

Equipment Layout and Connection Details



Connection Details

ID	Description
1a	Line power to contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
1b	Load power from contactors, and equipment grounding conductor. Requires one circuit per contactor, size wiring per load and voltage drop.
2a	Control power with equipment ground to control cabinet. Requires dedicated 20 A circuit. Provide transformer if control voltage not present.
3a	Control harnesses - Secondary cabinet to primary cabinet. Harness is provided by Musco in 8-foot length. Use minimum 2 inch diameter conduit for harness connector.

Equipment

ID	Description
1	Control and monitoring cabinet - primary
2	Control and monitoring cabinet - secondary

System Requirements: Control System Summary

Project Name: Tewinkle Park Baseball Softball LED Relight | Project #: 215836
Control System ID: 1 of 1
Distribution Panel Location/ID: Tewinkle Park Baseball Softball

Circuit Summary

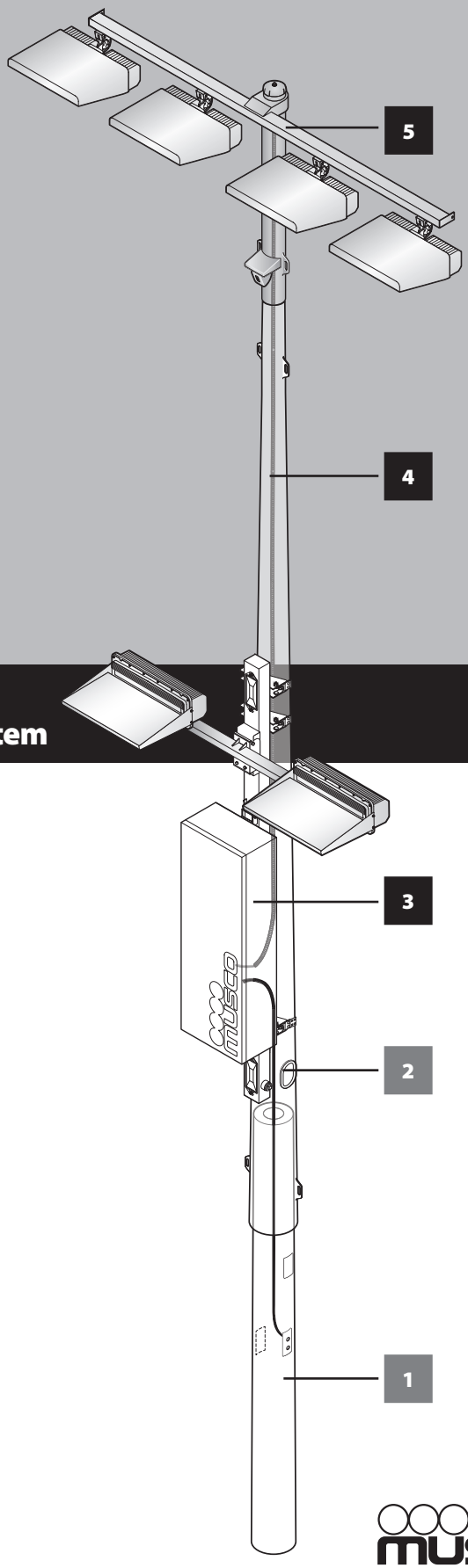
Switching Schedule	
Field/Switch Description	**Switches**
Baseball	1
Softball A	2
Softball B	3
Softball C	4

Control Module ID: 1

Lighting Circuit Voltage: 480/60/3

Circuit Summary by Switch							
Switch	**Zone Description**	**Pole ID**	**Qty of Fixtures**	**Full load amperes**	**Contactor Size (Amps)**	**Cabinet #**	**Contactor ID**
1	Baseball	A1	5	8.41	30	1	C1
	Baseball	A2	5	9.05	30	1	C2
	Baseball	B1	6	12.03	30	1	C3
	Baseball	B2	6	12.03	30	1	C4
	Baseball	C1	9	15.88	30	1	C5
	Baseball	C2	9	15.88	30	1	C6
2	Softball A	A1	4	5.81	30	1	C7
	Softball A	A4	4	6.45	30	1	C8
	Softball A	B1	5	9.05	30	1	C9
	Softball A	B4	5	9.05	30	1	C10
	Softball A	C7	5	7.07	30	1	C11
	Softball A	C8	5	7.71	30	1	C12
3	Softball B	A3	4	5.81	30	2	C13
	Softball B	A4	4	5.81	30	2	C14
	Softball B	B3	6	10.39	30	2	C15
	Softball B	B4	6	10.39	30	2	C16
	Softball B	C5	6	9.05	30	2	C17
	Softball B	C6	6	9.05	30	2	C18
4	Softball C	A2	4	7	30	2	C19
	Softball C	A3	4	6.36	30	2	C20
	Softball C	B2	5	9.05	30	2	C21
	Softball C	B3	5	9.6	30	2	C22
	Softball C	C3	6	9.05	30	2	C23
	Softball C	C4	6	9.6	30	2	C24

Installation Instructions:
Light-Structure System™ Retrofit Lighting System



Upgrade to TLC for LED® with 5 Easy Pieces™ approach to system design

5 **Poletop Luminaire Assembly**

4 **Wire Harness**

3 **Electrical Components Enclosure**

2 **Existing Galvanized Steel Pole**

1 **Existing Precast Concrete Base**

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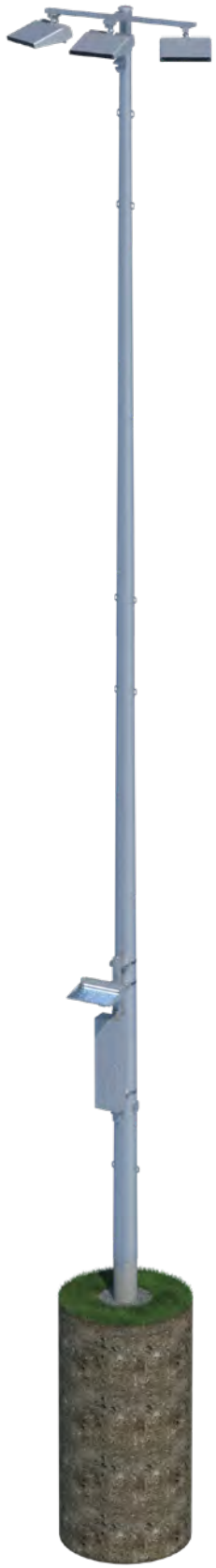

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TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Before You Begin

Safety Information

Electrical Safety Guidelines

Use extreme caution near overhead power lines or underground utilities. Observe all safety precautions for high-voltage equipment. Only qualified personnel may perform wiring. Follow all applicable building and electrical codes.

General Safety Guidelines

Follow proper safety procedures during installation. Installers must wear the appropriate personal protective equipment including:

- Hard hat
- Steel-toed shoes
- Leather work gloves
- Eye protection

Locate all underground utilities prior to digging.

All tools and equipment supplied by Musco are designed for specific use as described in these instructions. Do not use them in any other manner. Do not alter structural members in any way, such as bend, weld, or drill, without prior authorization from Musco.

Luminaires generate up to 2.6 mA per driver on the equipment grounding conductor and are designed to meet leakage current requirements per IEC 61347-1.

The luminaires should be positioned so that prolonged staring into the luminaire at a distance closer than 12–37 m (40–121 ft) is not expected, per IEC/TR 62778. See table.

Luminaire	Distance
TLC-LED-400	24 m (79 ft)
TLC-LED-550	24 m (79 ft)
TLC-BT-575	20 m (65 ft)
TLC-LED-600	24 m (79 ft)
TLC-LED-900	24 m (79 ft)
TLC-LED-1200	37 m (121 ft)
TLC-LED-1500	37 m (121 ft)

About These Instructions

These instructions give basic assembly procedures for the Light-Structure System retrofit. They are not a comprehensive guide to all possible situations. Direct any questions to your local Musco representative.

Throughout this manual note these important symbols:

The safety alert symbol alerts you of situations that require care and caution to avoid serious personal injury.

The tip symbol points out advice that makes installation easier.

The stop and check symbol signals you to stop and verify conditions before proceeding.

The recycle symbol identifies recyclable materials.

The contact Musco symbol appears in special situations where you may need to contact Musco for further information.

The go-to arrow indicates a branch in a procedure for special situations. In the case of optional equipment, the instructions may be in another document.

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

Contractor/installer supplied tools	Function	Page
Hammer, pry-bar, banding cutters	Unloading equipment	7
Ground resistance meter	Verifying existing lightning ground system	8
Angle grinder	Removal of poletop luminaire assembly	12
Dead blow mallet	Removal of poletop luminaire assembly	12
Two 1½ ton chain-type come-alongs	Jacking pole sections together	27
Large Phillips-head screwdriver	Tightening captive screws to seal enclosure to pole hub	11, 16
Standard screwdriver	Tightening distribution lugs, 45 A disconnect switch	10, 35
Torque wrench with ⅜, 7⁄16 and 9⁄16 in sockets	Tightening luminaire retaining cable and spreader bar hardware. Must cover a range of torque from 5 ft•lb to 40 ft•lb (6 N•m to 55 N•m)	17, 32
Torque wrench to cover the following ranges: 60 in•lb (6.8 N•m) to 120 in•lb (13.6 N•m) 16 ft•lb (21.7 N•m) to 40 ft•lb (54.2 N•m)	Proper torquing of fasteners	17 – 32
Electrical fish tape, electrician's tape	Feeding wire harness through pole	17
Spray paint, chalk, or flags	Marking points to sight in aiming	28
10 ft (3 m) stepladder or small line truck	Connecting supply wires to electrical enclosure	34, 35
Musco supplied tools	**Function**	**Page**
9⁄16 in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	11 – 32
1 1⁄16 in socket, extension, breaker bar, and 1 1⁄16 in wrench	Tightening structural fasteners	13, 31
7⁄16 in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	26
5⁄32 in hex key	Attaching handhole covers on base and steel pole	33, 35
3⁄16 in hex key	Attaching grounding conductors inside electrical enclosure	35
5⁄16 in hex key	Attaching grounding conductors inside pole at handhole	35
5 mm hex key	Landing primary feed wires on 125 A disconnect switch	35
Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)	Lubricating pole slip-fit connections	27
Machinery needed	**Function**	**Page**
Crane or forklift with nylon strapping and 8 ft (2.5 m) sling (sized to weight of poletop luminaire assembly)	Unloading materials, poletop assembly	7, 11 – 13, 21, 27
Manlift or bucket truck	Poletop setting and removal, enclosure setting and removal	7, 11 – 13, 21, 27
Load-rated crane, nylon slings, and shackles	Setting poletops	9 – 13, 21 – 23, 25 – 35

Documents You Need

- ❑ Musco *Pole Assembly Drawing*
- ❑ *Field Aiming Diagram*
- ❑ *Control System Summary*

If you do not have all of these documents, contact your local Musco representative.

Before You Begin

Electrical System Requirements

A qualified electrician must handle the electrical supply installation and hook-up in accordance with national, state, and local codes. Your electrician should review this information before installation begins.

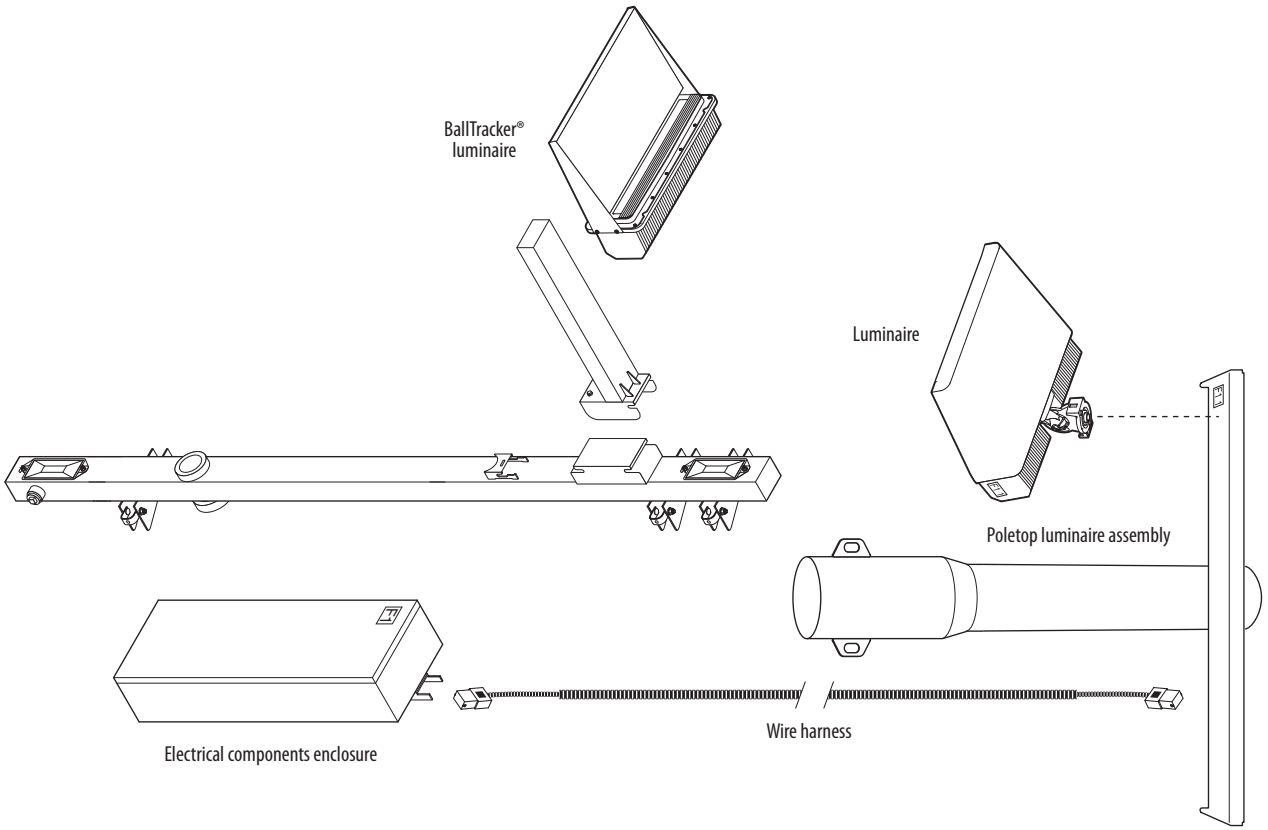
Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

Always dispose of electronic waste in accordance with all applicable laws and regulations.

Components Matching and Labeling

Pole locations are identified by a pole ID (A1, A2, B1, B2, etc.) on the *Field Aiming Diagram*. These IDs are also marked on the individual components:

- Poletop luminaire assemblies, bolt-on crossarms, and luminaire shipping cartons
- Wire harnesses
- Electrical components enclosures



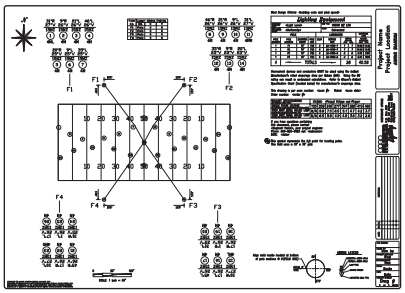
Before You Begin

Documents We Provide

Field Aiming Diagram

The *Field Aiming Diagram* is your map for locating all poles on your project. It gives this information:

- Pole IDs, locations, and heights
- Luminaire IDs
- Common aiming point for all poles, or individual aiming points for each pole
- Full load current for each luminaire



Control System Summary

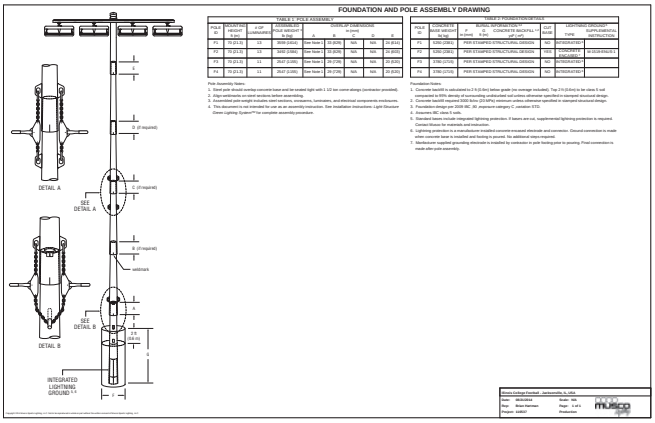
Projects with a control system include a *Control System Summary*. It gives this information:

- Control system diagram and details
- Contactors and cabinets
- Lighting circuits
- Voltage, phase, and frequency
- Full load current for each circuit

Musco Pole Assembly Drawing

This drawing provides information related to the installation of the poletop luminaire assembly.

- Poletop or crossarm weight
- Poletop luminaire assembly minimum overlaps



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Before You Begin

Unloading Instructions

A typical shipment includes electrical components enclosures, wire harnesses, and poletop luminaire assemblies with luminaires.

For ease of installation, set all matched components by the proper pole location as noted on the *Field Aiming Diagram*.

Tools/Materials Needed

- ❑ Crane with nylon web sling or forklift (load rated)
- ❑ Hammer
- ❑ Pry bar
- ❑ Banding cutters

Warning
Crushing hazard.

Do not cut shipping bands or remove blocking from equipment until it is supported by unloading equipment.

- Check bill of lading to verify you have all materials.
- Inspect all materials for shipping damage.
- Store electrical components enclosures and luminaires in a dry location or cover with tarp until ready to install.

If additional information is needed, contact your local Musco representative.

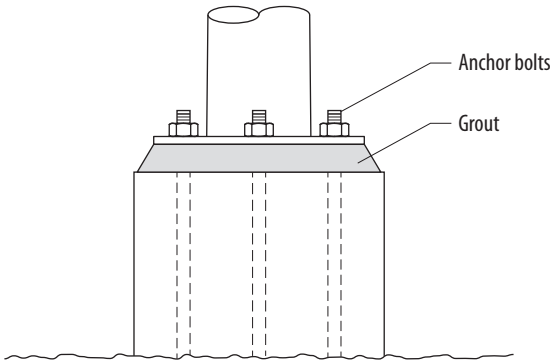
Please recycle.
Luminaires, wire harnesses, and other components are shipped in recyclable cardboard packaging.

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Before You Begin

Inspections

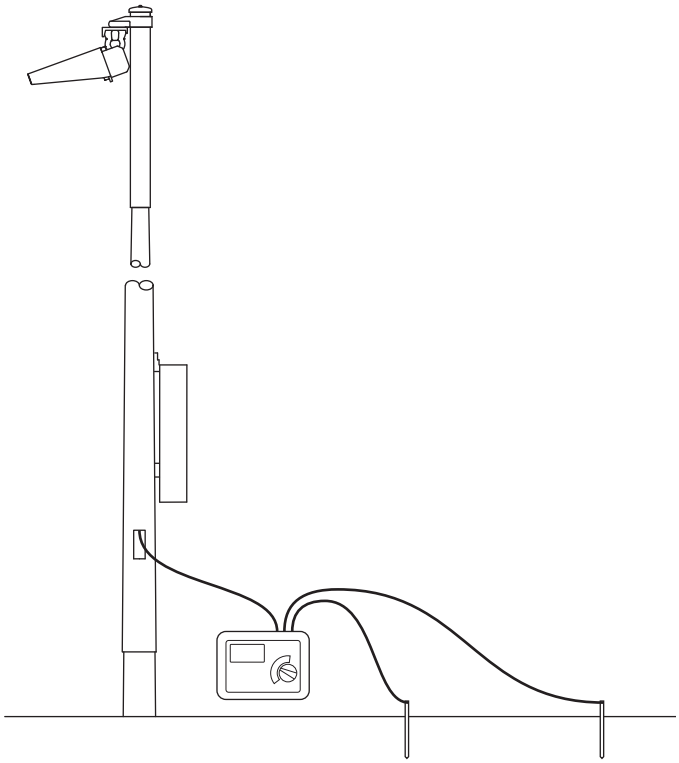
1 A qualified inspector must examine the base and pole sections for damage or prior field modifications.



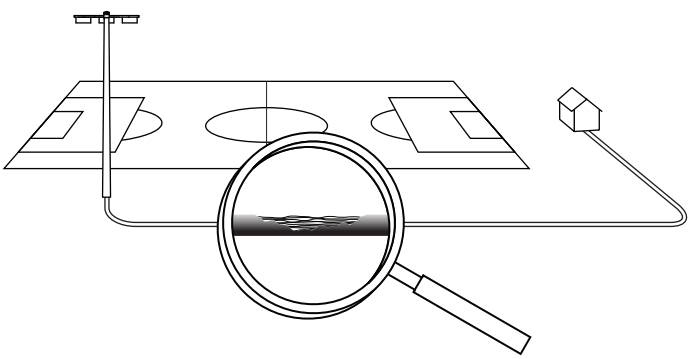
2 Repair grout on baseplate poles (if necessary).

3 If pole is equipped with an external ground rod, test earth ground connection of pole. If greater than 25 ohms, install additional ground rod and retest.

Repeat until < 25 ohms.



4 To the extent possible, inspect power supply wiring for good condition. Leakage current should not exceed 20 mA.



Notify your local Musco representative if concerns are identified with any of these items.

Disassembly

Overview

Remove the existing equipment to be replaced: electrical components enclosures, wire harness, and poletop luminaire assembly (or bolt-on crossarms).

Tools/Materials Needed

Musco Supplied (For bolt-on crossarms.)

- ❑ 1 1/16 in socket, ¾ in drive
- ❑ Breaker bar, ¾ in drive
- ❑ 4 in extension, ¾ in drive
- ❑ 1 1/16 in wrench

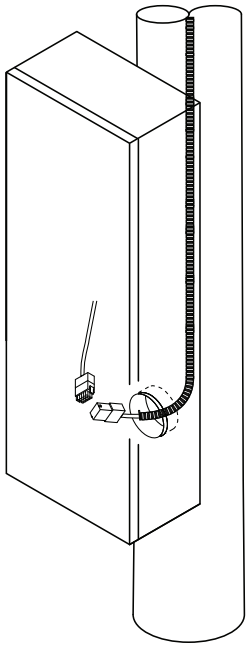
Contractor Supplied

- ❑ 9/16 in wrench, 9/16 in socket and ratchet
- ❑ Angle grinder with metal cutting wheel
- ❑ Crane and slings to support poletop luminaire assembly
- ❑ Dead blow hammer
- ❑ Ratchet, ¾ in drive

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Disassembly

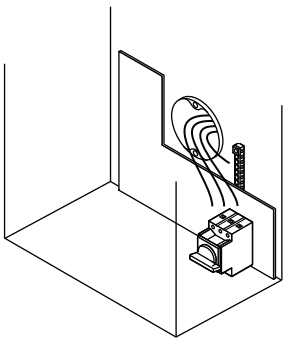
1 In electrical components enclosure, disconnect pole harness from enclosure harness. Feed end of pole harness into pole interior. Cut off connector if necessary.



Warning

Risk of electrical shock

Ensure all circuits are disconnected before proceeding



2 Disconnect electrical supply wiring and equipment grounding conductor.

3 Remove wire harnesses between top, middle, and bottom boxes.

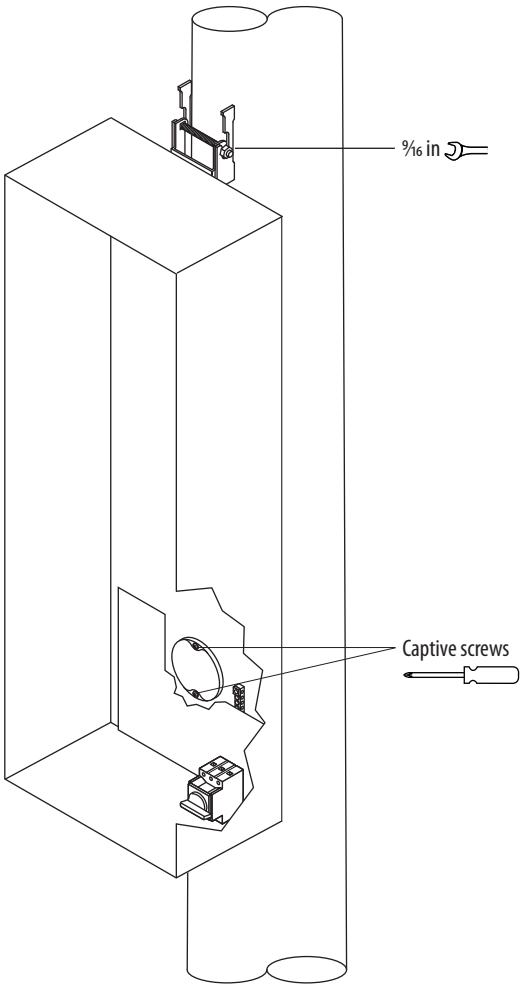
4 Remove wiring between stacks.

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Disassembly

5 Using 9⁄16 in wrench and Phillips screwdriver, loosen enclosure hanger bolts, and captive hub screws.

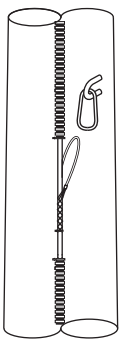
6 Using a crane and sling, remove enclosures from the stack, starting at the top.



Caution

Electrical components enclosures are heavy.

Enclosures may weigh up to 225 lb (102 kg). Lift with caution.



7 Disconnect middle wire support grip on poles greater than 80 ft (24.5 m).

Leave the pole harness connected to the poletop luminaire assembly. It will pull out as the poletop is removed.

Disassembly

8 Determine if entire poletop luminaire assembly (welded crossarms) or crossarms only (bolted crossarms) will be replaced.

If replacing bolt-on crossarms, skip to *Bolt-on Crossarm Removal*.

9 Using 9⁄16 in wrench, loosen set screw.

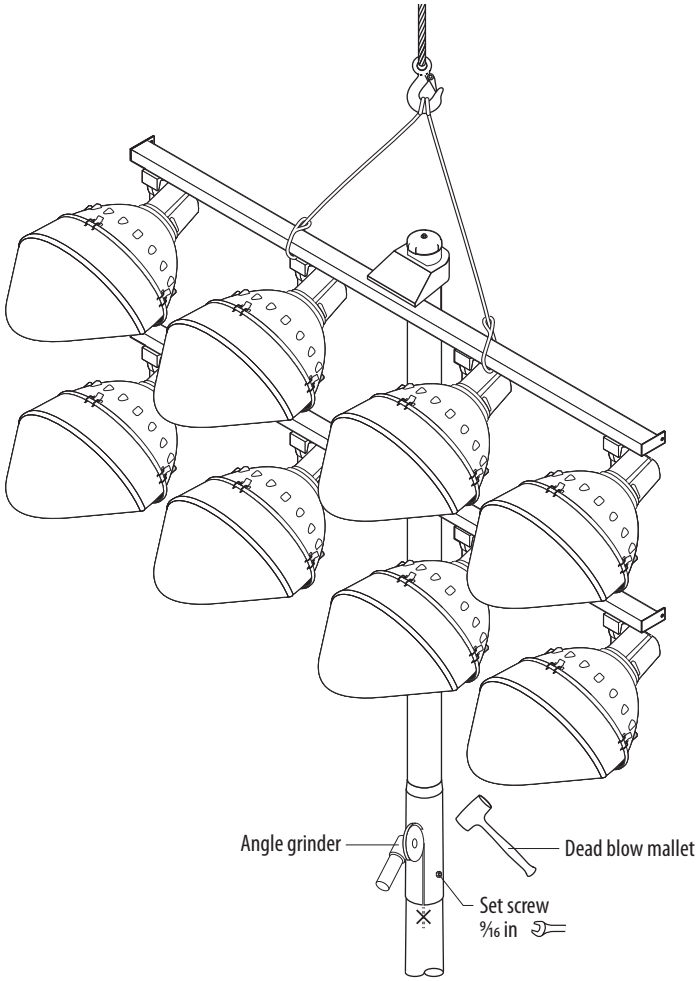
10 Use crane to sling around the top crossarm and provide a slight separating force to the poletop.

Warning
Crushing hazard.

Do not attempt to "pop off" the poletop using the crane only as the high separating forces can cause an uncontrolled separation and potential injury.

11 Use an angle grinder to make a relief cut in the overlap area of the poletop luminaire assembly. Do not damage the pole section underneath the poletop.

12 Tap on the poletop with a dead blow mallet until it begins to move and separate.



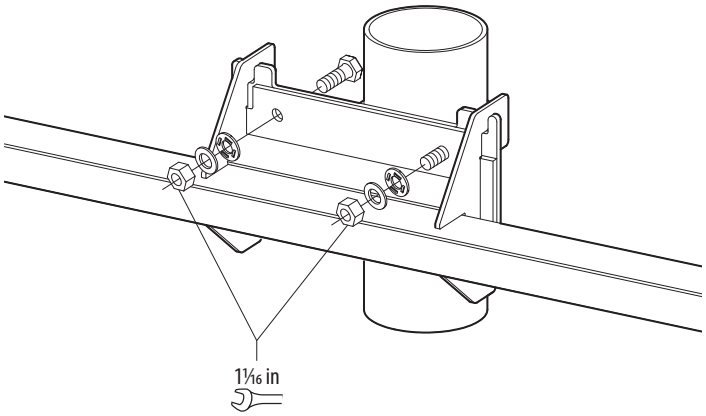
TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Disassembly

Bolt-On Crossarm Removal

1 Use crane and sling to support crossarm.

2 Use supplied breaker bar, 1 1/16 in socket, extension, and wrench to remove crossarm retaining bolts.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

Overview

The electrical components enclosure is factory-wired and tested. It contains essential electrical components of the lighting system in an accessible location.

Tools/Materials Needed

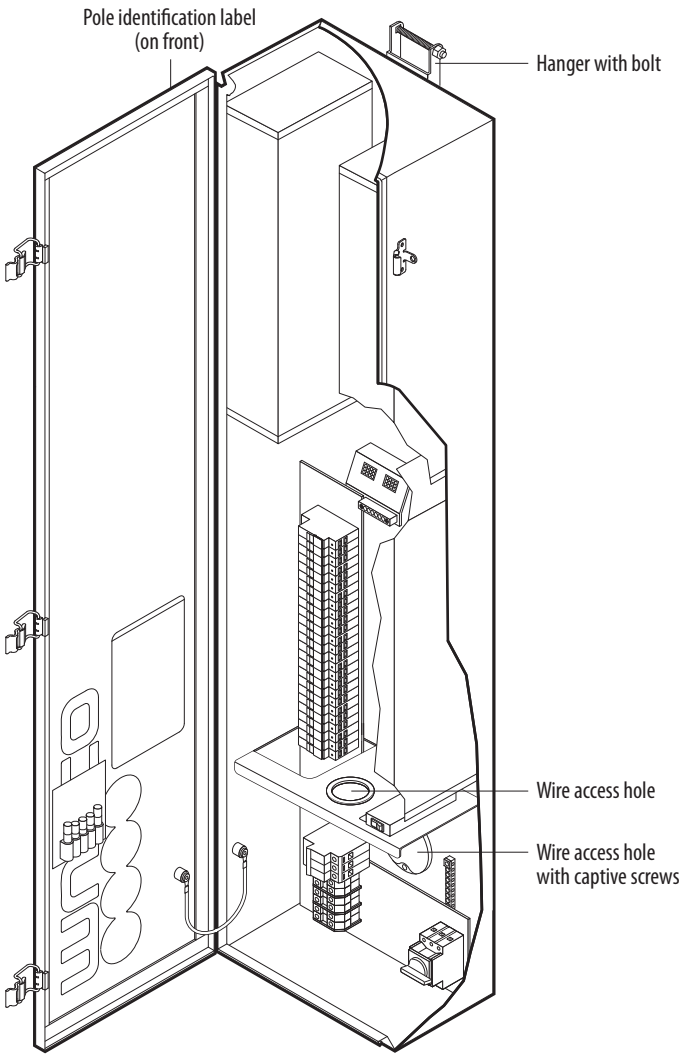
Musco Supplied

- ❑ ½ and 9⁄16 in offset combination wrenches
- ❑ Snips
- ❑ *Field Aiming Diagram*

Contractor Supplied

- ❑ Torque wrench with ½ and 9⁄16 in sockets
- ❑ Large Phillips-head screwdriver
- ❑ Measuring tape
- ❑ Marker
- ❑ 10 ft (3 m) stepladder or small line truck

Consult project documents to determine if your enclosures will mount on existing hangers or if new mounting bracket has been provided.



Electrical Components Enclosure and BallTracker® Luminaire

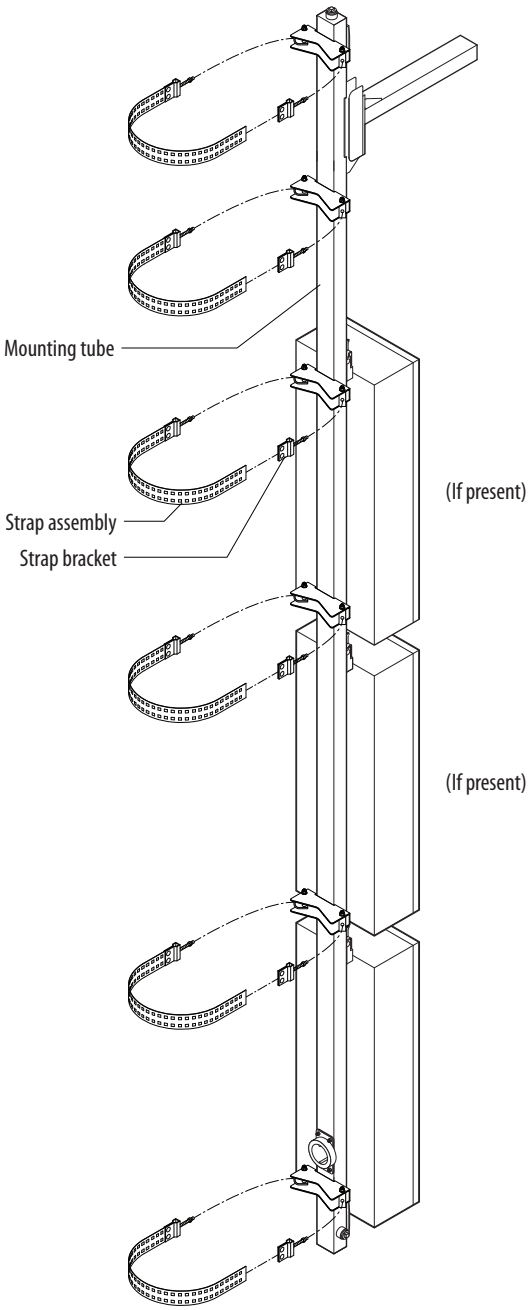
Round Pole Strap Selection

Diameter	Round Pole Strap Length
0 – 17 in (0 – 432 mm)	45 in (1143 mm)
17.01 – 22 in (432 – 559 mm)	60 in (1524 mm)
22.01 – 28 in (559 – 711 mm)	78 in (1981 mm)
28.01 – 34 in (711 – 864 mm)	96 in (2438 mm)
34.01 – 40 in (864 – 1016 mm)	114 in (2896 mm)
40.01 – 46 in (1016 – 1168 mm)	132 in (3353 mm)

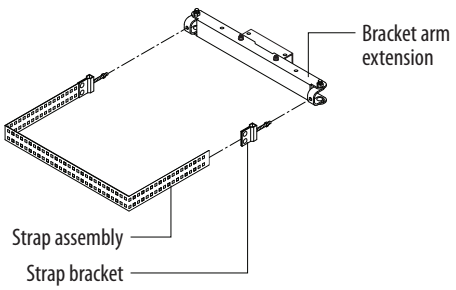
Square Pole Strap and Bracket Selection

Width	Strap Length	Bracket Arm Extension Width
0 – 12 in (0 – 304 mm)	45 in (1143 mm)	14 in (356 mm)
12.01 – 16 in (304 – 406 mm)	60 in (1524 mm)	18.5 in (470 mm)
16.01 – 20 in (406 – 508 mm)	78 in (1981 mm)	22.5 in (572 mm)
20.01 – 24 in (508 – 610 mm)	96 in (2438 mm)	26.5 in (673 mm)
24.01 – 28 in (610 – 711 mm)	114 in (2896 mm)	30.5 in (775 mm)

Mounting tubes are marked with pole ID. One strap assembly and one strap bracket required per mounting arm (as shown).



Round pole option (shown)



Option for square pole

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Electrical Components Enclosure and BallTracker® Luminaire

Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

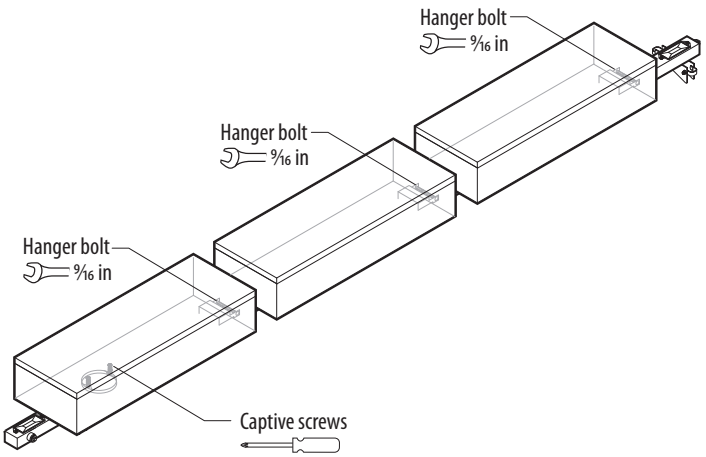
Assembly Procedure

Caution
Electrical components enclosures are heavy.

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

1 Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillips-head screwdriver. Tighten hanger bolt with 9⁄16 in wrench.

2 Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with 9⁄16 in wrench.



Electrical Components Enclosure and BallTracker® Luminaire

3 If pole includes a BallTracker® luminaire, attach bracket using ¾ in socket and torque wrench. Tighten captive bolts to 40 ft•lb (54 N•m).

4 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route crossarm wire harness to upper handhole for connection to pole harness.

Ensure crossarm wire harness is not pinched between mating plates.

5 Attach luminaire using 7⁄16 in wrench. Tighten captive screws until fully tight. Do not exceed 20 ft•lb (27 N•m).

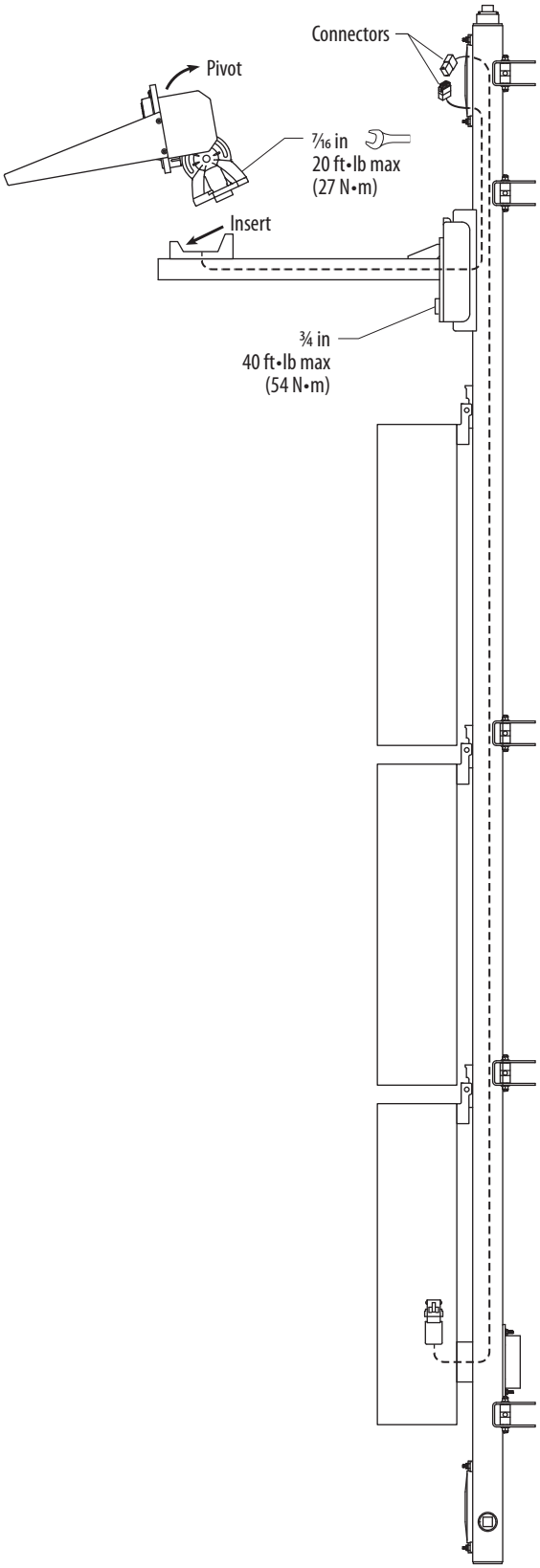
6 Pull BallTracker® wire harness through tube.

Feed bottom of harness into enclosure hub.

7 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use handholes to access tube and aid in routing pole harness. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

8 Attach support grips at top handhole.

9 Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.



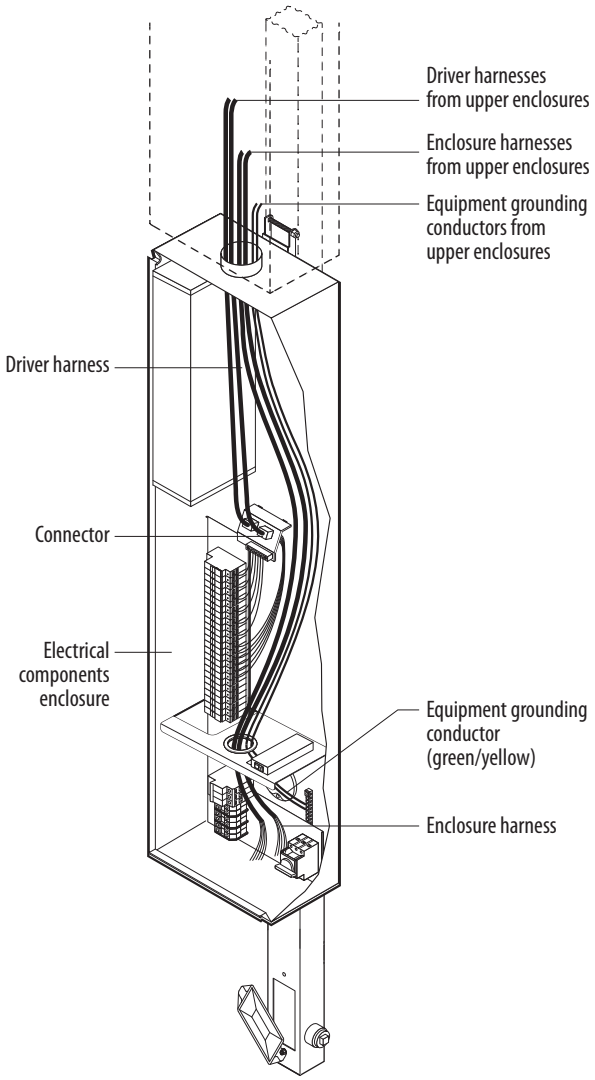
TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician.

10 Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.

11 Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.



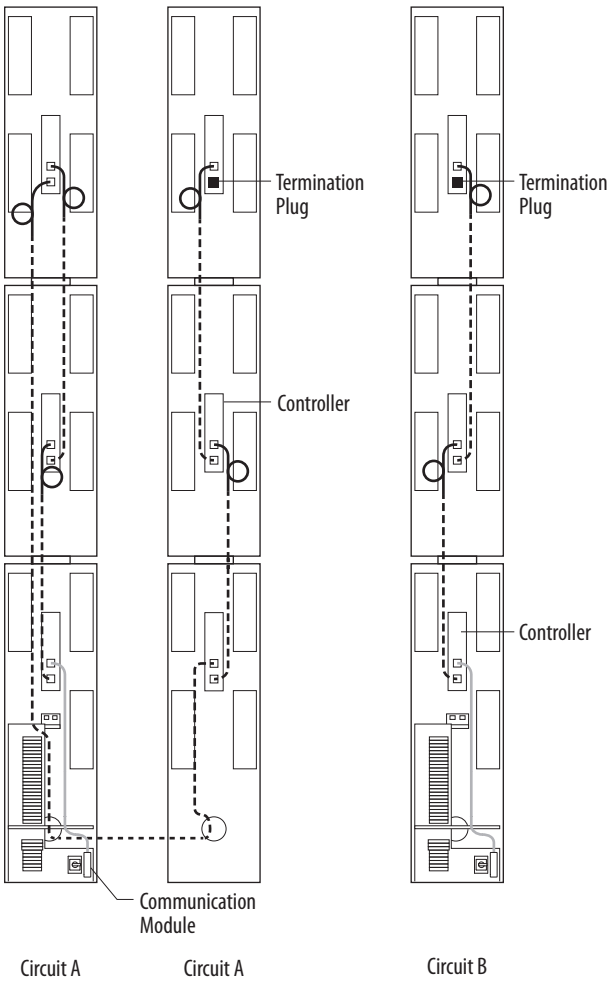
TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 9–10 if controller not present

12 Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown.

Connections between stacks must be done after stacks are mounted on the pole.

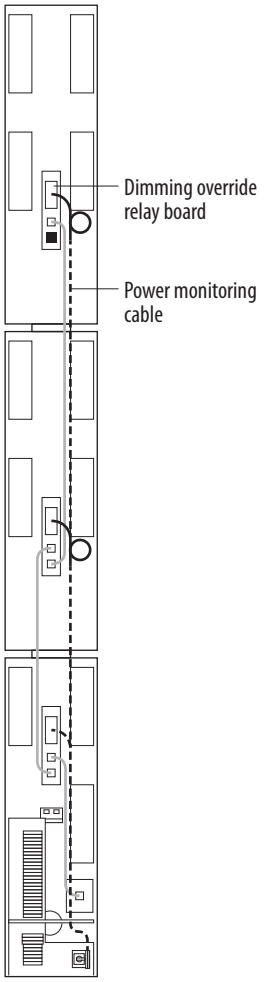


TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 10 if emergency egress lighting dimming override relay board is not present.

13 Pull power monitoring cable from dimming override relay board in top and middle enclosures down to bottom enclosure and land black wire on terminal block M1 and blue/white wire on terminal block M2.



Electrical Components Enclosure and BallTracker® Luminaire

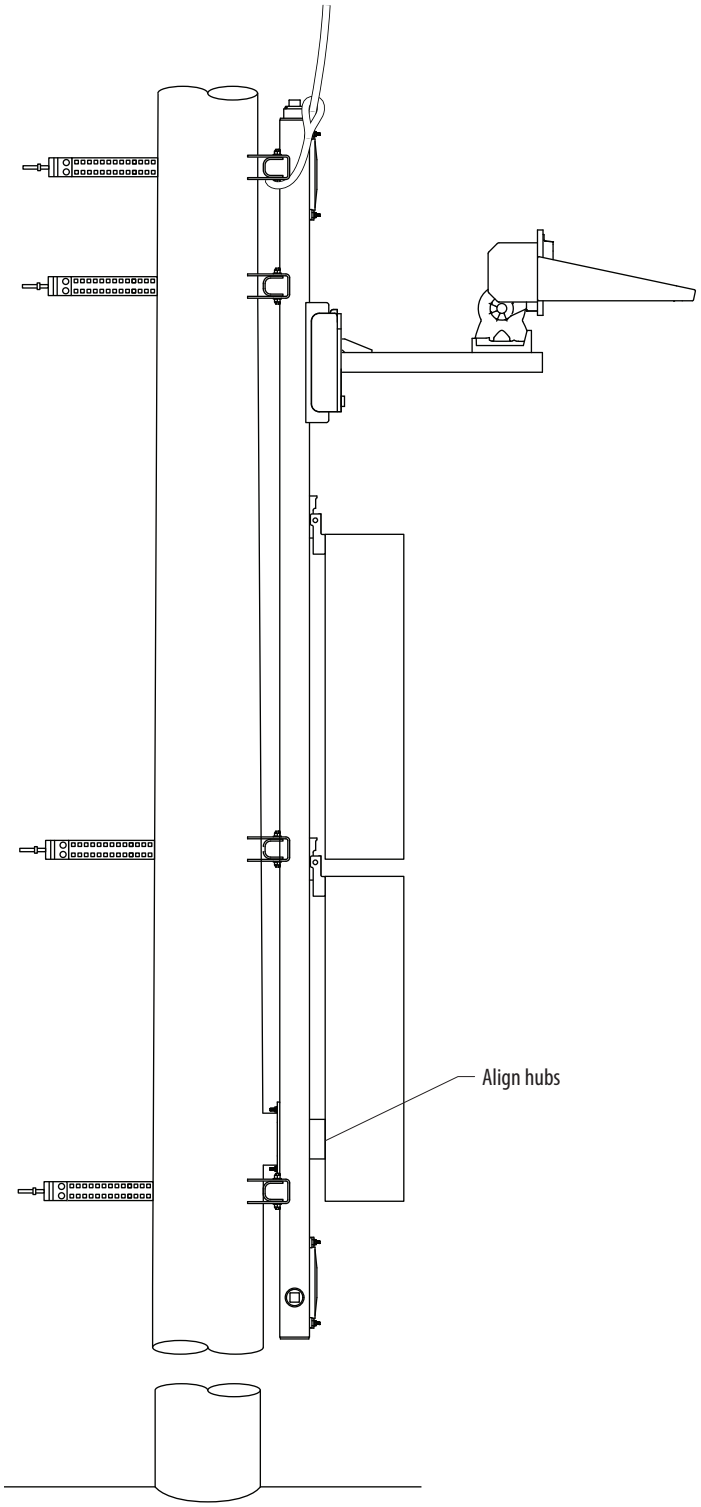
Installation Procedure

- ☑ Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

1. Sling enclosure stack under the welded arm for strapping connections (not under the BallTracker luminaire crossarm) and lift enclosure stack.
2. Align hub on tube with pole hub.

- ☑ Enclosure stacks that are not mounted on a pole hub will include cover plates for tube opening. Ensure these plates are installed.

- ☑ BallTracker® luminaires should face the field. If pole hub does not face the field, contact your Project Engineer or local Musco representative.



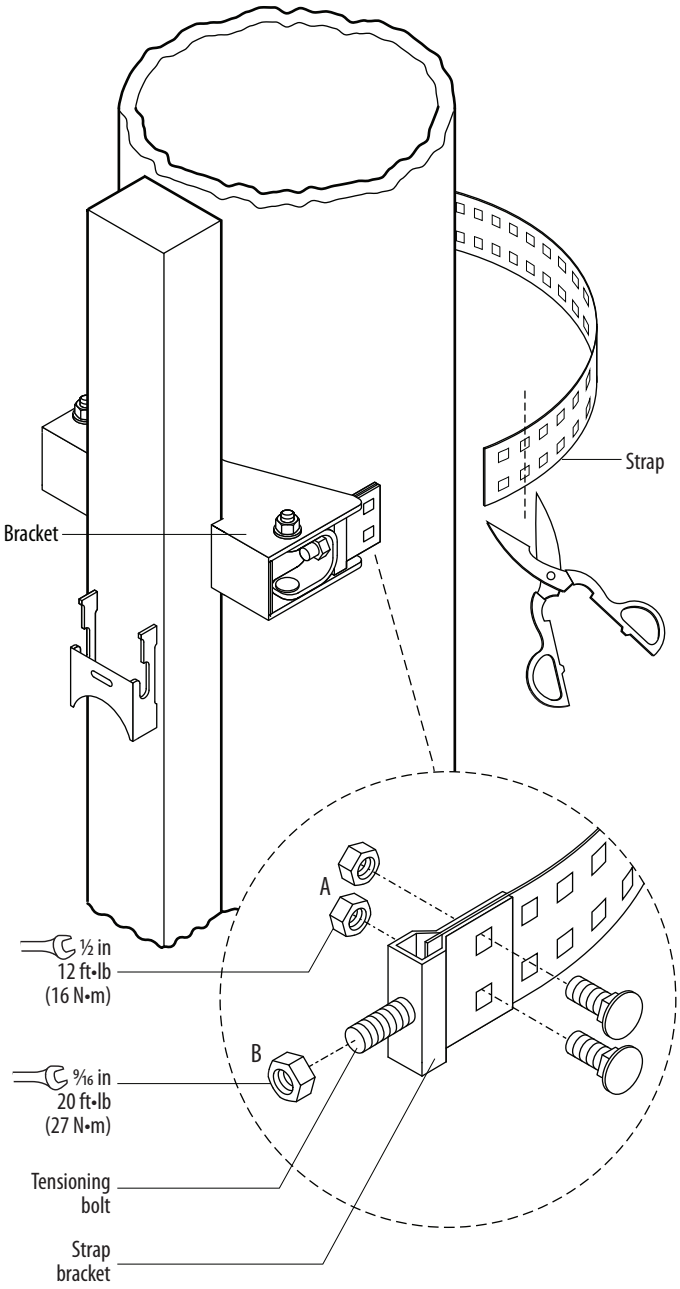
Electrical Components Enclosure and BallTracker® Luminaire

3 Cut straps to required length. Pull tight around pole and trim excess within 1 in (25 mm) of strap bracket. Cut across square holes, not between them.

4 Attach brackets to pole. Torque 5⁄16 in strap bracket hardware A to 12 ft•lb (16 N•m) using ½ in socket and torque wrench. Torque all ⅜ in tensioning nuts B to 20 ft•lb (27 N•m) using 9⁄16 in socket and torque wrench.

Caution
Falling equipment hazard
Ensure you meet torque values specified on all tensioning hardware.

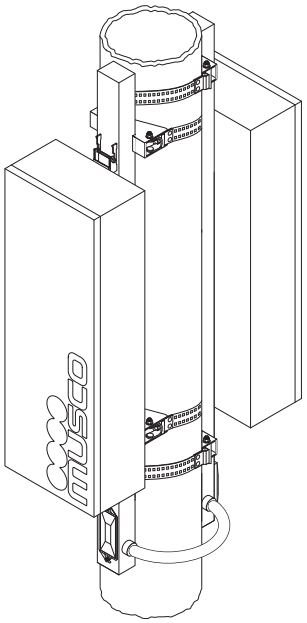
If tensioning bolt is fully seated and strap is not yet tight, trim strap at next set of holes and repeat step 4.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Electrical Components Enclosure and BallTracker® Luminaire

5 Repeat steps 3 and 4 for back-to-back or multiple stacks.



6 Use 1¼ in hubs provided to run flex conduit between electrical component enclosure stacks.

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Luminaire Attachment

Overview

Luminaires are factory built and shipped in individual cartons. They are aimed in the factory and ready for installation. Do not disassemble knuckle.

Tools/Materials Needed

Musco Supplied

❏ 7⁄16 in ratcheting combination wrench

Contractor Supplied:

❏ Torque wrench with 7⁄16 in socket

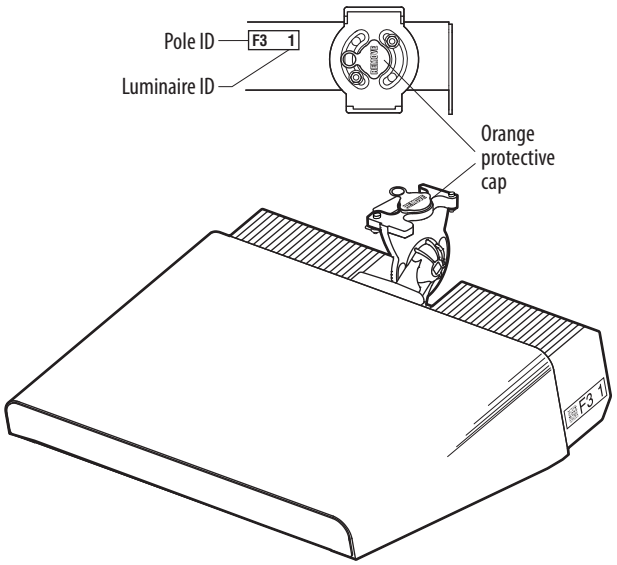
Leave luminaires in box until ready to assemble. Keep protective cover on luminaire until ready to set pole. Do not leave luminaires unassembled from crossarm in wet conditions.

Assembly Procedure

Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.

1 Remove and discard orange protective caps from luminaire knuckle and mounting plate that cover electrical connections. Do not remove orange tag around captive bolts.

Note: The luminaire style may vary from what is shown.



Warning

Rotation may be required to assemble all luminaires onto the poletop luminaire assembly. Do not stand under poletop when lifting. Steady with two people holding crossarms. Allow for poletop to safely rotate around when it is high enough for crossarms to clear the ground.

Caution

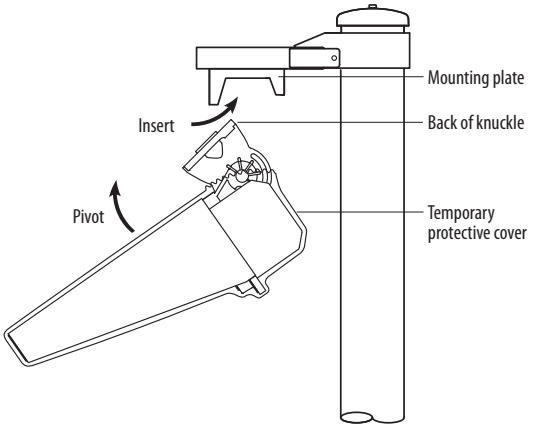
Equipment Damage

Properly support poletop to ensure luminaires do not get damaged.

TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Luminaire Attachment

2 Match luminaire ID to crossarm and install luminaire onto mounting plate. Insert back of knuckle into mounting plate and pivot into position.



Note: The luminaire style may vary from what is shown.

Luminaire	Weight
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1500	67 lb (30 kg)
TLC-RGB-U	20 lb (9 kg)
TLC-RGBW	40 lb (18 kg)

Caution

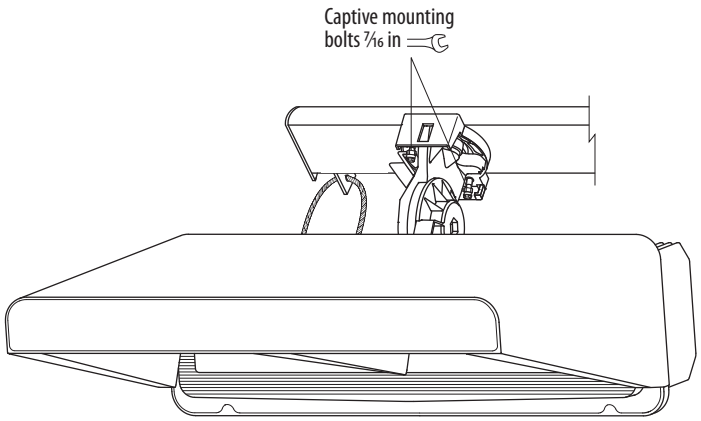
Luminaire may be heavy. Lift carefully with two people to avoid injury.

Luminaire Attachment

3 Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight - continue tightening. Torque must not exceed 20 ft•lb (27 N•m). To avoid overtightening, use provided 7⁄16 in combination wrench.

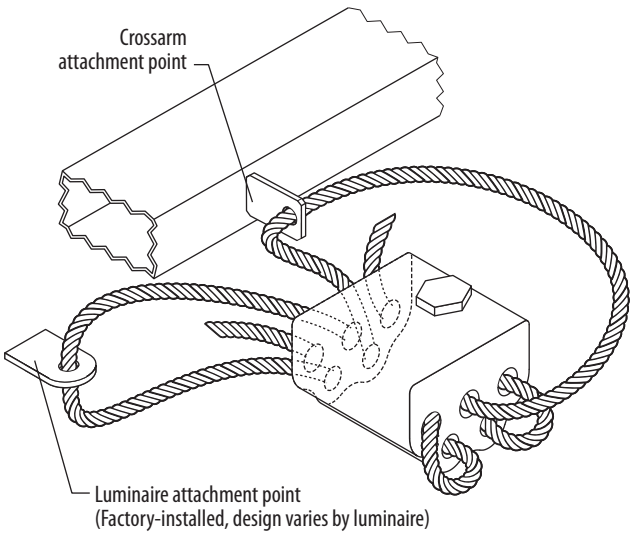
Warning
Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



4 Attach luminaire retaining cable (if present). Route luminaire cable through crossarm anchor point, through luminaire block, and back through the block under the set screw. Luminaire attachment point will vary per luminaire design.

5 Using 7⁄16 in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).



Poletop Luminaire Assembly

Overview

The galvanized steel pole and poletop luminaire assembly are designed to slip-fit together. Jacking ears on pole section and poletop assembly provide attachment points to pull sections together. The Musco *Pole Assembly Drawing* gives minimum overlap specifications for each poletop luminaire assembly.

Tools/Materials Needed

Musco Supplied

- ❑ Musco *Pole Assembly Drawing*
- ❑ 9/16 in wrench
- ❑ Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Contractor Supplied

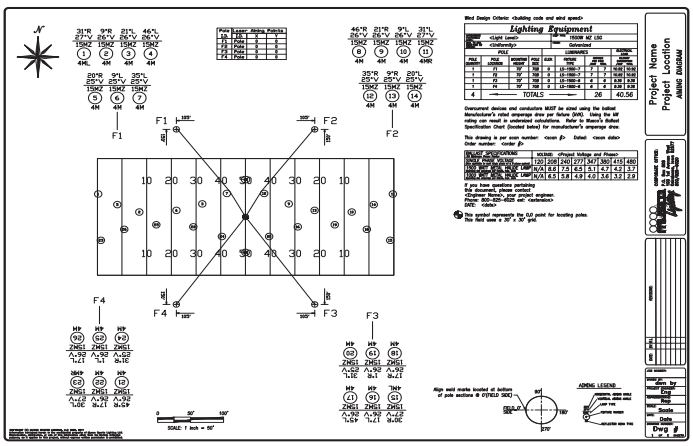
- ❑ Two 1½ ton chain come-alongs

If pole utilizes bolt-on bars, skip to next section. See Musco *Pole Assembly Drawing*.

Assembly Procedure

Verify pole ID on each poletop luminaire assembly matches pole location on *Field Aiming Diagram*. Pole ID is labeled on crossarm.

1 Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



Poletop Luminaire Assembly

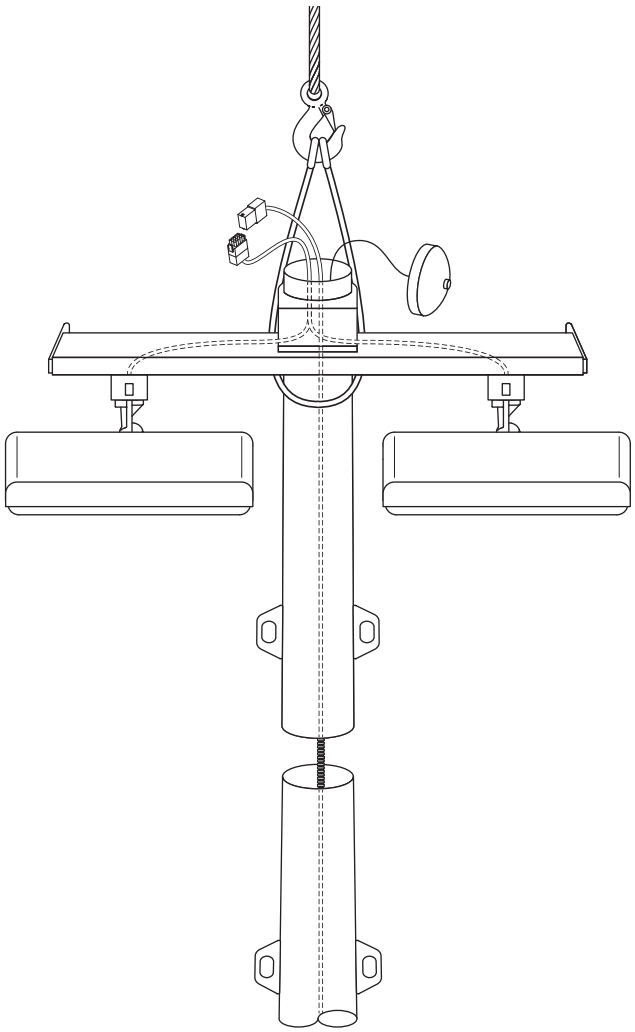
2 Turn on pole alignment beam.

3 Hook pole harness wire support grip to the poletop luminaire assembly u-hook and bundle the pole harness to the bottom crossarm.

4 Lubricate top of steel pole section with supplied dishwashing liquid.

5 Sling and lift poletop luminaire assembly into place.

6 Carefully lower the pole harness(es) down into the pole. The attached cable support hook will prevent the pole harness from dropping.

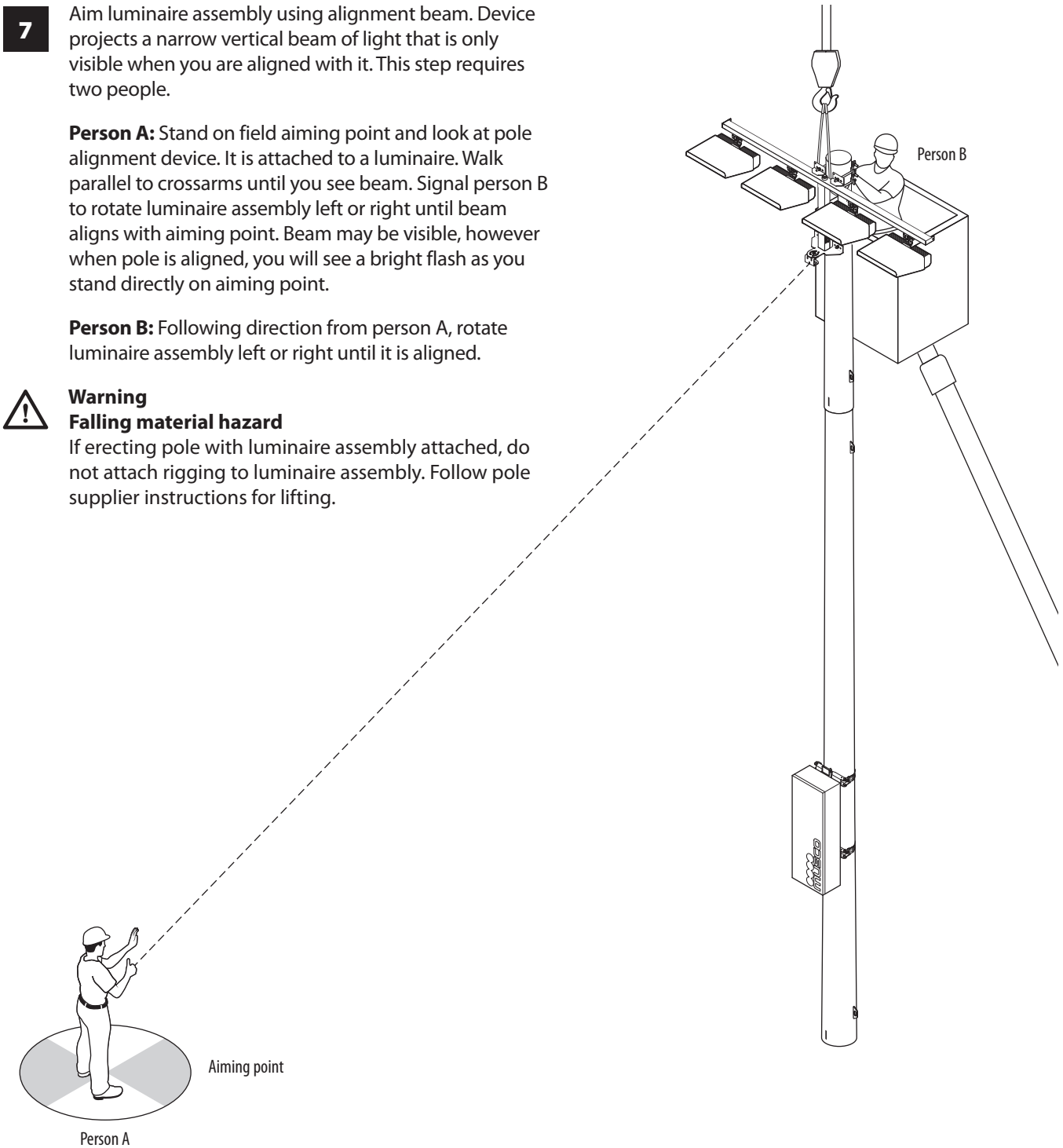


Poletop Luminaire Assembly

7 Aim luminaire assembly using alignment beam. Device projects a narrow vertical beam of light that is only visible when you are aligned with it. This step requires two people.

Person A: Stand on field aiming point and look at pole alignment device. It is attached to a luminaire. Walk parallel to crossarms until you see beam. Signal person B to rotate luminaire assembly left or right until beam aligns with aiming point. Beam may be visible, however when pole is aligned, you will see a bright flash as you stand directly on aiming point.

Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



Warning
Falling material hazard
If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.

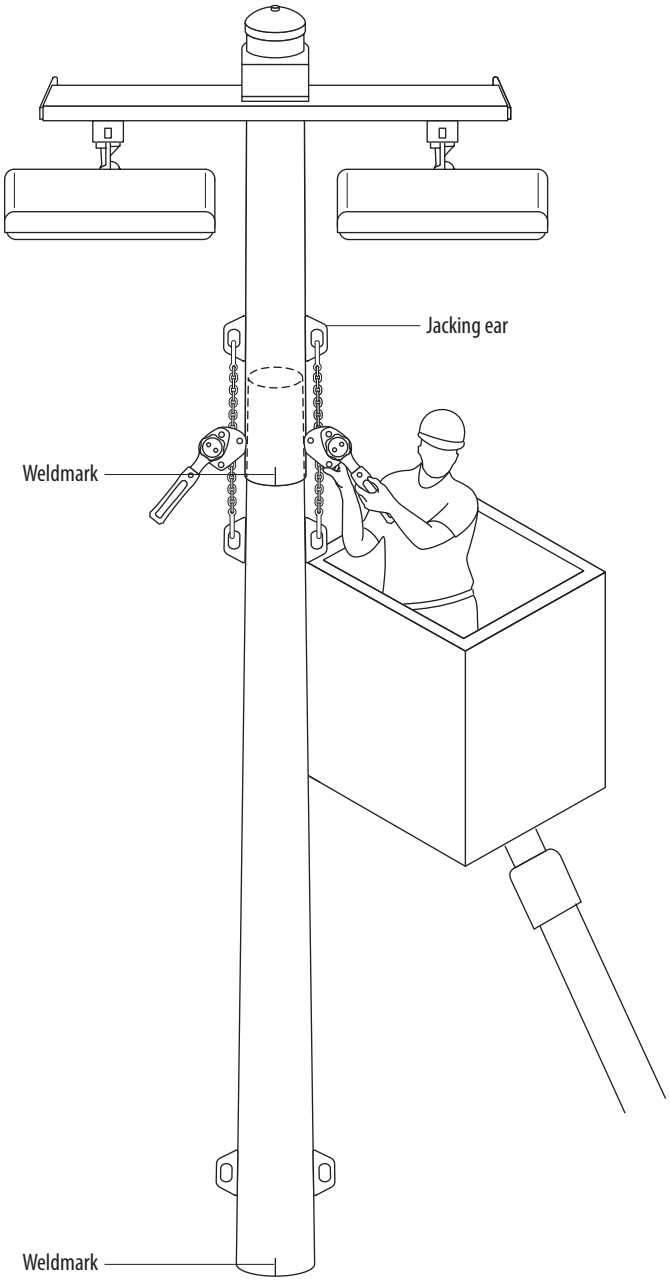
Warning
Laser radiation hazard
Pole alignment beam is safe for viewing at a distance of three feet (one meter) or more. Do not look into beam from closer than three feet (one meter). Do not use binoculars, camera, or telescope to view beam from any distance. Locator beam is a class 2M laser device. Wavelength: 635-660 nm, Laser power for classification: <1 mW continuous, divergence: <1.5 mrad x 1 rad. Using alignment beam in a manner other than as described here may result in hazardous exposure. Do not modify, dismantle, or attempt to repair.

Poletop Luminaire Assembly

8 Using two 1½ ton come-alongs, pull poletop luminaire assembly onto pole evenly until tight. Ensure minimum overlap per Musco *Pole Assembly Drawing*.

✓ Ensure alignment is maintained while tightening.

9 Tighten set screw using 9⁄16 in wrench.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Bolt-on Crossarms

Overview

Bolt-on bar style may vary from what is shown. Replacement procedure is identical.

Tools/Materials Needed

Musco Supplied:

- ❑ ¾ in drive 1⅛ in socket
- ❑ ¾ in drive breaker bar
- ❑ ¾ in drive 4 in extension
- ❑ 1⅛ in wrench
- ❑ Spreader bars
- ❑ ⅜ in fasteners (for spreader bars)
- ❑ ⅝ in structural fasteners
- ❑ ⅝ in wrench

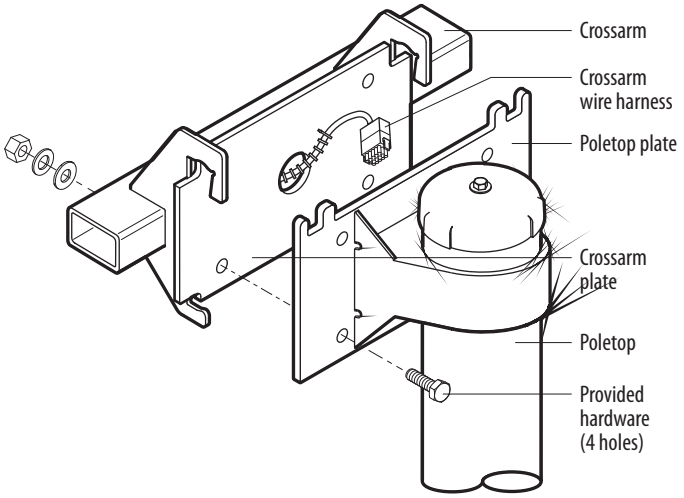
Contractor Supplied:

- ❑ Torque wrench with ⅝ in socket

Assembly Procedure

Verify pole ID on crossarm matches ID of pole.

Note: Each crossarm is factory assembled for a specific position on poletop section to ensure correct aiming. Top side of crossarm is labeled with crossarm's position number. Example: Position 1 is installed on first position from top of poletop section.



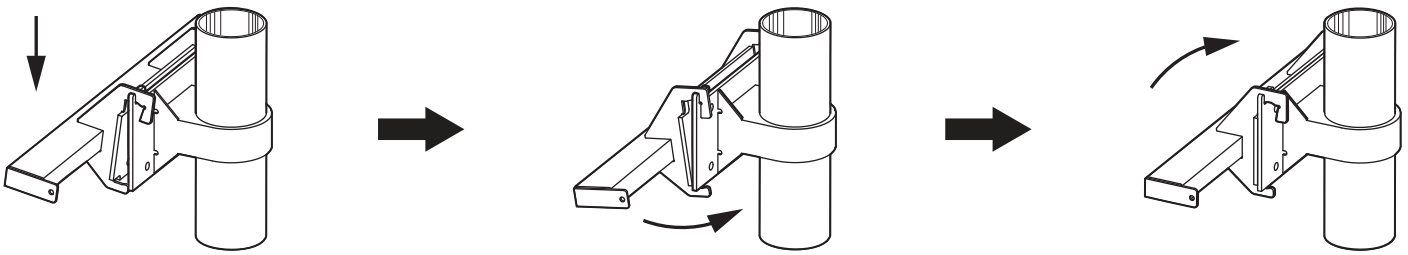
1 Position crossarm near poletop, and feed crossarm wire harness through hole in center of poletop plate.

Route wire harness for crossarms 1–3 to top of pole.

Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2 Position crossarm as shown below.

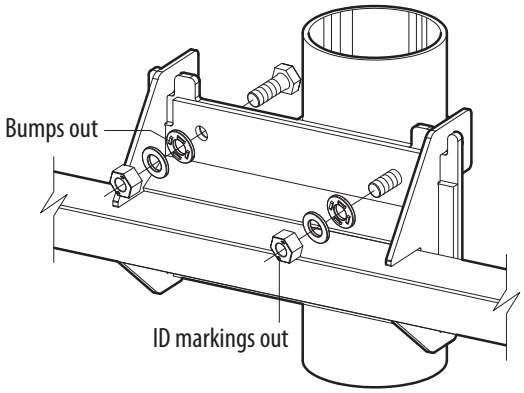
Ensure crossarm wire harness is not pinched between mating plates.



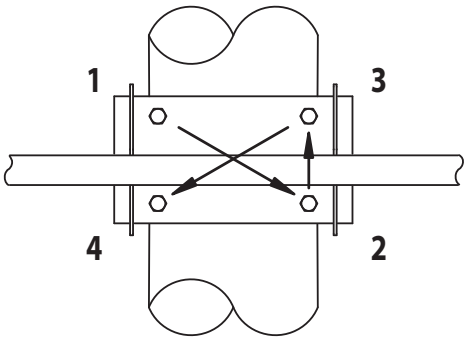
TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Bolt-on Crossarms

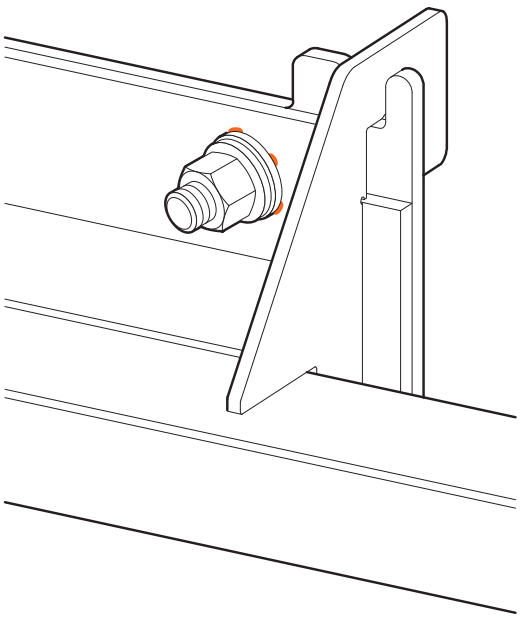
3 Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



4 Snug all nuts. Using supplied 1⅛ in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



5 Using supplied breaker bar, 1⅛ in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.



6 Repeat steps 1–5 for remaining crossarms.

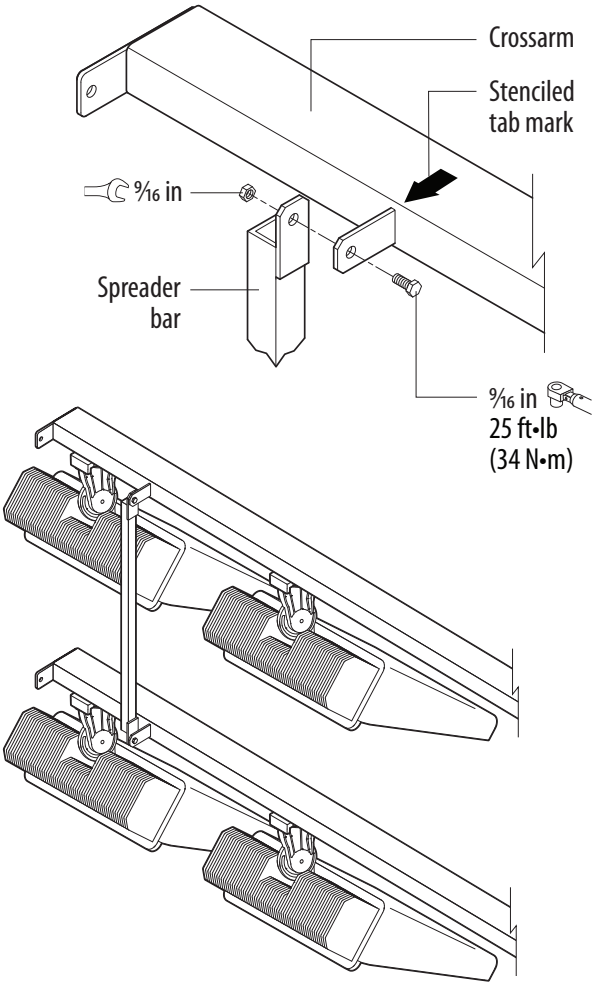
Do not reuse structural fasteners. Discard if removed or loosened after tightening.

Bolt-on Crossarms

Refer to the Musco *Field Aiming Diagram* to determine if a pole requires spreader bars. If so, spreader bars are bundled together and marked with the pole ID. Additionally, the pole crossarms are stenciled indicating which tabs to use. Crossarms are joined in groups of two or three with the greatest grouping on top; do not form other groupings.

7 Install spreader bars with ⅜ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30½ in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Wire Harness

Overview

Tools/Materials Needed

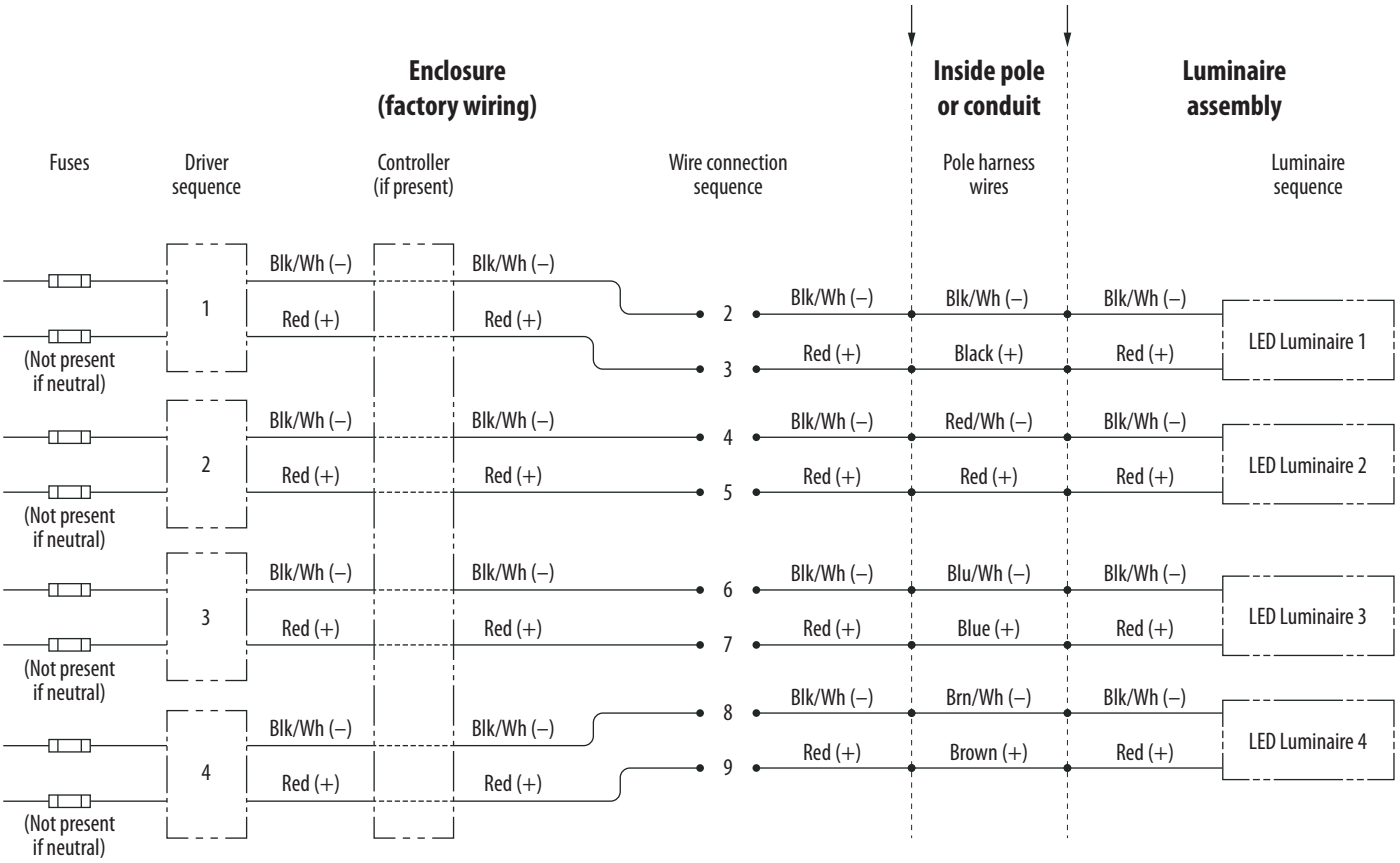
Musco Supplied

- ❑ 5⁄32 in hex key
- ❑ 9⁄16 in wrench

Contractor Supplied

- ❑ Fish tape
- ❑ Electrician's tape

The factory-built wire harness connects the electrical components enclosure to the poletop luminaire assembly.



Notes:

1. Pole harness wire color indicated if provided by Musco.
2. Enclosure factory wiring may be different than shown above. One pair of wires per luminaire is required in pole harness.

Wire Harness

Assembly Procedure

Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

1 Remove handhole covers using 5⁄32 in hex key. Remove polecap using 9⁄16 in wrench.

2 Fish all pole wire harnesses between poletop and appropriate electrical components enclosure(s). Use lower handhole to access enclosure hubs. Ensure protective sleeve extends through access hub and tuck harnesses behind subpanel.

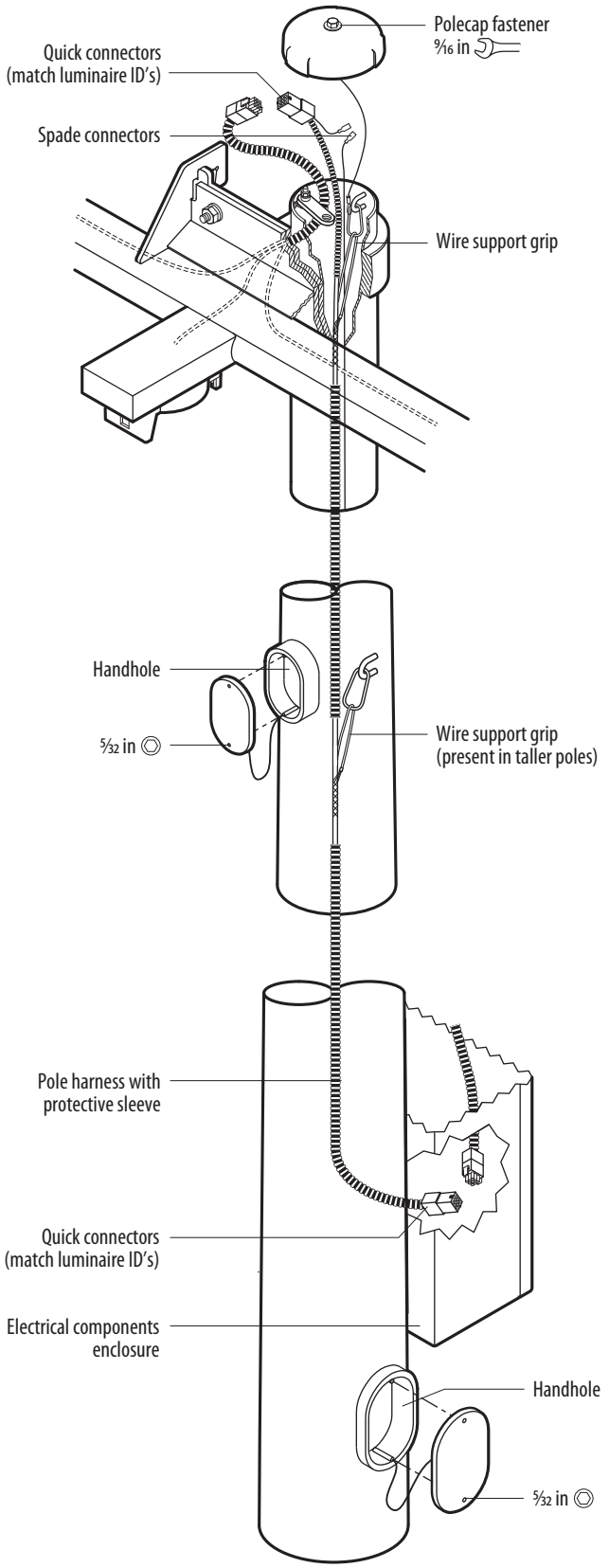
3 Attach support grips at midpole (if present).

4 Mate quick connectors at poletop and inside first stack of electrical components enclosures. Match driver/ luminaire IDs.

For additional stacks of enclosures, connect pole harnesses using the Musco-provided LEVER-NUTS wire connectors. Match luminaire ID and wire polarity per each wire label.

Use electrical tape to ensure LEVER-NUTS® levers stay secure and don't snag on surrounding wires.

5 Replace handhole covers and polecap.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX
ATTACHMENT 2

Connecting to Supply Wiring

Overview

The final step of installation is connecting the supply wiring at the subpanel. Terminals for phase wires and neutral (if used), disconnect switch with lockout, and equipment ground bar are provided on the subpanel in the electrical components enclosure. If there are multiple circuits on the pole, a disconnect is provided for each circuit. This may be on a separate subpanel in another enclosure. Depending on foundation design and/or soil conditions, a supplemental grounding electrode may be required.

Tools/Materials Needed

Musco Supplied

- ❑ 3⁄16 in hex key (ground bar)
- ❑ 5⁄16 in hex key (bonding terminal inside handhole)
- ❑ 5⁄32 in hex key (handhole covers)
- ❑ 5 mm hex key (125 A disconnect terminals)
- ❑ Equipment bonding jumper

Contractor Supplied

- ❑ Standard screwdriver
- ❑ 3 m (10 ft) stepladder or small line truck

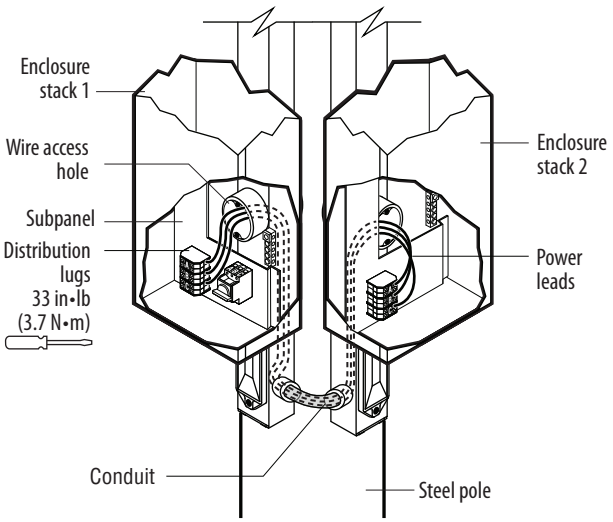
Installation Procedure

Musco *Control System Summary* or *Field Aiming Diagram* provides electrical loading information needed to size wire and switchgear.

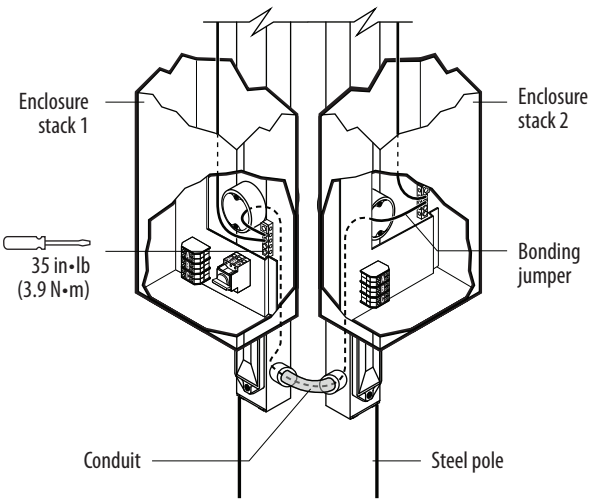
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.

1 If pole has multiple stacks on the same electrical circuit then route lower loads from second stack to distribution lugs on main subpanel.

Route all power leads for lighting equipment to appropriate subpanel locations.



2 Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one. Tighten lugs using 3⁄16 in hex key.



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Connecting to Supply Wiring

3 Remove handhole cover using 5⁄32 in hex key. Rout supply wiring through access hub into electrical components enclosure.

4 Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using 3⁄16 in hex key.

Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.

5 Connect phase wires (supply) to disconnect switch. Tighten lugs using standard screwdriver (45 A disconnect) or 5 mm hex key (125 A disconnect). Connect neutral wire (if used) to distribution lug. Tighten lug using standard screwdriver.

6 Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 5⁄16 in hex key.

7 Ensure all handhole covers are installed and electrical components enclosure is closed and latched.

If your project includes a supplemental grounding electrode kit, follow instructions in kit for installing electrode.

Warning
Risk of electric shock.

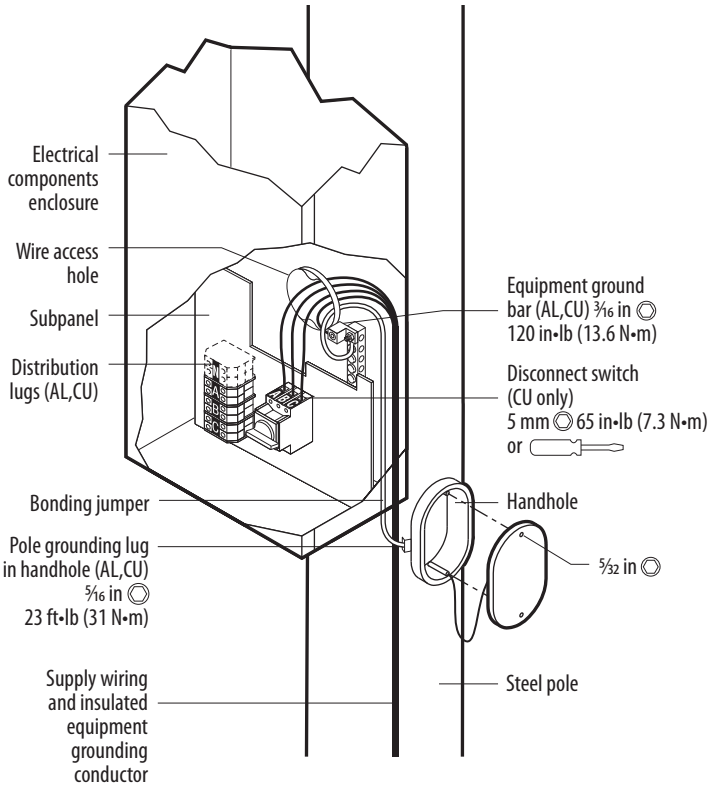
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

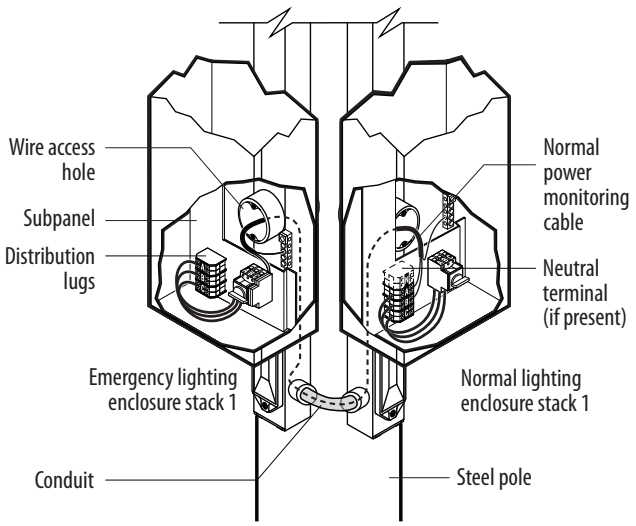
Warning
Lightning hazard.

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

Skip step 8 if no emergency egress lighting is present.

8 Route cable for normal power to adjacent enclosure stack. Connect black wire and blue/white wire to any two active terminals A, B, C, or neutral, if present, and green wire to ground bar.

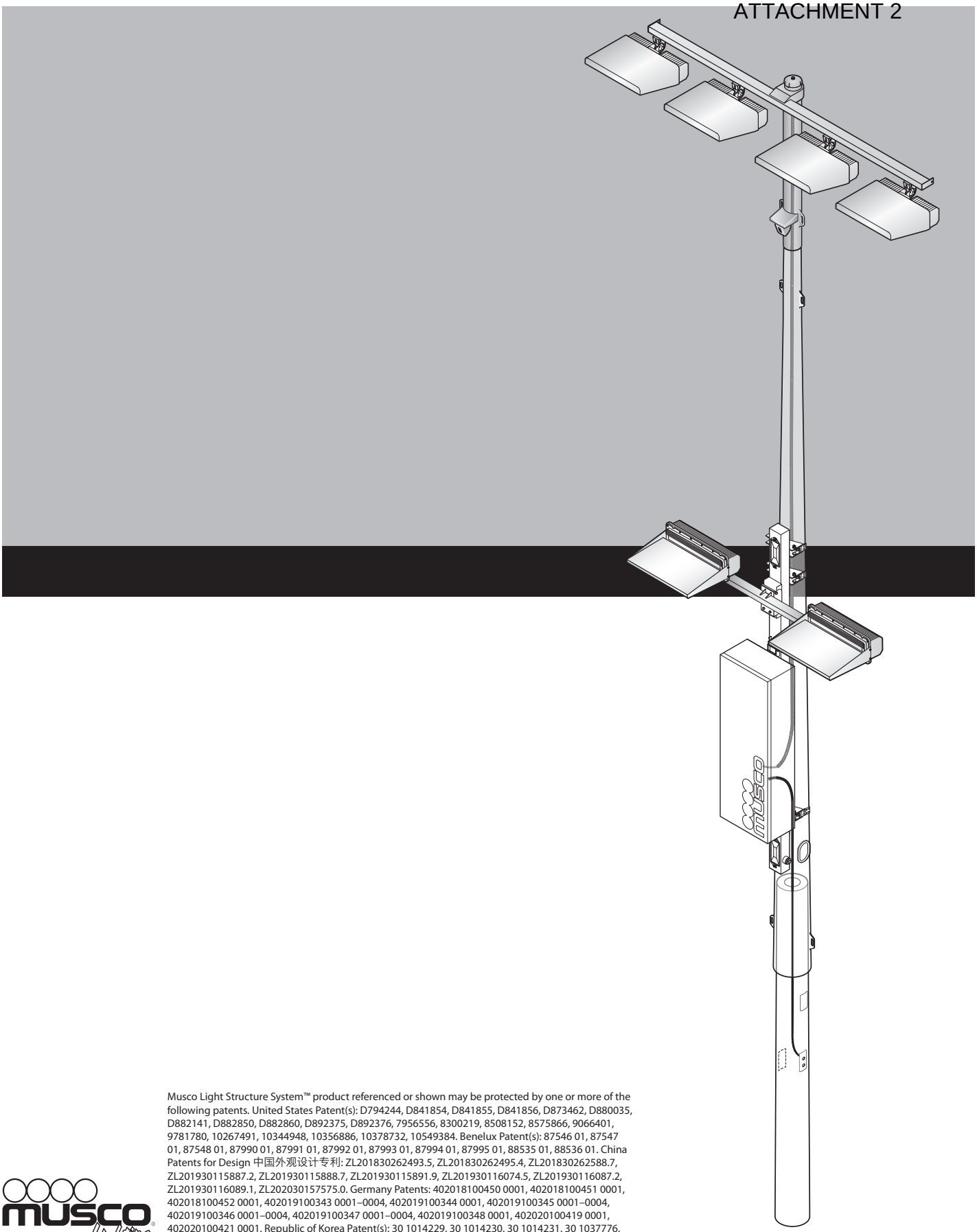




Notes

Notes

ATTACHMENT 2



Musco Light Structure System™ product referenced or shown may be protected by one or more of the following patents. United States Patent(s): D794244, D841854, D841855, D841856, D873462, D880035, D882141, D882850, D882860, D892375, D892376, 7956556, 8300219, 8508152, 8575866, 9066401, 9781780, 10267491, 10344948, 10356886, 10378732, 10549384. Benelux Patent(s): 87546 01, 87547 01, 87548 01, 87990 01, 87991 01, 87992 01, 87993 01, 87994 01, 87995 01, 88535 01, 88536 01. China Patents for Design 中国外观设计专利: ZL201830262493.5, ZL201830262495.4, ZL201830262588.7, ZL201930115887.2, ZL201930115888.7, ZL201930115891.9, ZL201930116074.5, ZL201930116087.2, ZL201930116089.1, ZL202030157575.0. Germany Patents: 402018100450 0001, 402018100451 0001, 402018100452 0001, 402019100343 0001–0004, 402019100344 0001, 402019100345 0001–0004, 402019100346 0001–0004, 402019100347 0001–0004, 402019100348 0001, 402020100419 0001, 402020100421 0001. Republic of Korea Patent(s): 30 1014229, 30 1014230, 30 1014231, 30 1037776, 30 1037783 0001–0004, 30 1037788 0001–0004, 30 1037795, 30 1037796 0001–0004, 30 1037802 0001–0004, 30 1110351, 30 1110358, 30 1110362. United Arab Emirates Patent(s): 5678, 5679, 5680, 5984, 5985, 5986, 5987, 5988, 5989. United Kingdom Patent(s): 6032011, 6032022, 6032023. 6056943, 6056944, 6056945, 6056946, 6056947, 6056948, 6088584, 6088586, 6088587. U.S. and foreign patents pending. [Pat_085A]

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MISCELLANEOUS

CONTRACT

DOCUMENTS

CITY OF COSTA MESA
PUBLIC WORKS AGREEMENT FOR
CITY PROJECT NO. 23-09

THIS PUBLIC WORKS AGREEMENT ("Agreement"), dated _____ ("Effective Date"), is made by the CITY OF COSTA MESA, a political subdivision of the State of California ("CITY"), and _____, a [state] [type of organization] ("CONTRACTOR").

CITY desires to construct the public work and improvements described below under Scope of Work, Paragraph 1 ("Work").

ACCORDINGLY, the parties hereto agree as follows:

1. SCOPE OF WORK.

The Work consists of _____.

The Work is further described in the "Contract Documents" referred to below.

The Project is known as the LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, City Project No 23-09 ("Project").

2. CONTRACT DOCUMENTS.

The complete Agreement consists of the following documents relating to the Project:

a. This Agreement;

b. CONTRACTOR's bid;

c. Notice inviting bids;

d. Complete plans, profiles, detailed drawings and specifications, including general provisions and special provisions;

e. Certificates of Insurance;

f. Faithful Performance Bond and Labor and Material Bond, including agent's

SAMPLE

Power of Attorney for each bond;

g. Supplements, attachments, and exhibits attached to the above items;

h. Provisions of the most current edition of The Greenbook: Standard Specifications for Public Works Construction ("The Greenbook"); and

i. All addenda setting forth any modifications or interpretations of the above documents.

The documents attached hereto are incorporated herein by this reference. The Greenbook is incorporated by reference as if fully set forth herein. The documents comprising the complete Agreement will be referred to as the "Contract Documents."

All of the Contract Documents are intended to complement one another, so that any Work called for in one and not mentioned in another is to be performed as if mentioned in all documents.

In the event of an inconsistency in the Contract Documents, the terms of this Agreement shall prevail over all other Contract Documents. The order of precedence between the remaining Contract Documents shall be as set forth in The Greenbook.

The Contract Documents constitute the entire agreement between the parties and supersede any and all other writings and oral negotiations.

3. CITY'S REPRESENTATIVE.

The CITY's Representative is _____, referred to herein as the Project Manager ("Project Manager").

4. CONTRACTOR'S PROJECT MANAGER; PERSONNEL.

(a) Project Manager. CONTRACTOR's Project Manager must be approved by City. Such approval shall be at CITY's sole discretion.

(b) Personnel. CITY has the right to review and approve any personnel who are assigned to perform work under this Agreement. CONTRACTOR shall remove

SAMPLE

personnel from performing work under this Agreement if requested to do so by CITY.

This Paragraph 4 is a material provision of the Agreement.

5. SCHEDULE.

All Work shall be performed in accordance with the schedule approved on behalf of CITY by the Project Manager, and in accordance with the time of performance set forth in Paragraph 8 (Time of Performance).

6. EQUIPMENT - PERFORMANCE OF WORK.

CONTRACTOR shall furnish all tools, equipment, apparatus, facilities, labor and materials necessary to perform and complete the Work of construction in a good and workmanlike manner in strict conformity with the Contract Documents.

The equipment, apparatus, facilities, labor and material shall be furnished and such Work performed and completed as required in the plans and specifications to the satisfaction of the Project Manager or his or her designee, and subject to his or her approval.

7. CONTRACT PRICE.

_____ ($_____.00).

8. TIME OF PERFORMANCE.

CONTRACTOR shall commence Work by the date specified in CITY's Notice to Proceed, unless a later date is agreed upon in writing by the parties. The Work shall be completed within FORTY (40) WORKING DAYS from the first day of commencement of the Work.

9. TERMINATION.

(a) Termination for Convenience.

CITY may terminate this Agreement at any time, with or without cause, by providing thirty (30) days' written notice to CONTRACTOR.

SAMPLE

(b) Termination for Breach of Contract.

(i) If CONTRACTOR refuses or fails to prosecute the Work or any severable part of it with such diligence as will ensure its timely completion, or if CONTRACTOR fails to complete the Work on time, or if CONTRACTOR, or any subcontractor, violates any of the provisions of the Contract Documents, the Project Manager may give written notice to CONTRACTOR and CONTRACTOR's sureties of the CITY's intention to terminate this Agreement; and, unless within five (5) days after the serving of that notice, such conduct shall cease and arrangements for the correction thereof be made to the satisfaction of the CITY, this Agreement may be terminated at the option of CITY effective upon CONTRACTOR's receipt of a second notice sent by the CITY indicating that the CITY has exercised its option to terminate.

(ii) If CONTRACTOR is adjudged bankrupt or files for any relief under the Federal Bankruptcy Code or State insolvency laws, this Agreement shall automatically terminate without any further action or notice by CITY.

(iii) If CONTRACTOR is in breach of any material provision of this Agreement, CITY may immediately terminate this Agreement by providing written notice to CONTRACTOR of same.

10. LIQUIDATED DAMAGES.

In the event the Work is not completed, for any reason, within the time required including any approved extensions of time, and to the satisfaction of the Project Manager, CITY may, in addition to any other remedies, equitable and legal, including remedies authorized by Paragraph 9 (Termination) of this Agreement, charge to CONTRACTOR or its sureties, or deduct from payments or credits due CONTRACTOR, a sum equal to **$1,250** as liquidated damages for each calendar day beyond the date provided for the completion of such Work.

SAMPLE

The parties hereto agree that the amount set forth above, as liquidated damages constitutes a fair and reasonable estimate of the costs the CITY would suffer for each day that the CONTRACTOR fails to meet the performance schedule. The parties hereby agree and acknowledge that the delays in the performance schedule will cause CITY to incur costs and expenses not contemplated by this Agreement.

11. PERFORMANCE BY SURETIES.

In the event CONTRACTOR fails or refuses to perform the Work, CITY may provide CONTRACTOR with a notice of intent to terminate as provided in Paragraph 9 (Termination), of this Agreement. The CITY shall immediately give written notice of such intent to terminate to CONTRACTOR and CONTRACTOR's surety or sureties, and the sureties shall have the right to take over and perform this Agreement; provided, however, that the sureties must, within five (5) days after CITY's giving notice of termination, (a) give the CITY written notice of their intention to take over the performance of this Agreement; (b) provide adequate assurances, to the satisfaction of the CITY that the Work shall be performed diligently and in a timely manner; and (c) must commence performance thereof within five (5) days after providing notice to the CITY of their intention to take over the Work. Upon the failure of the sureties to comply with the provisions set forth above, CITY may take over the Work and complete it, at the expense of CONTRACTOR, and the CONTRACTOR and the sureties shall be liable to CITY for any excess costs or damages including those referred to in Paragraph 10 (Liquidated Damages), incurred by CITY. In such event, CITY may, without liability for so doing, take possession of such materials, equipment, tools, appliances, Contract Documents and other property belonging to CONTRACTOR as may be on the site of the Work and reasonably necessary therefor and may use them to complete the Work.

SAMPLE

12. DISPUTES PERTAINING TO PAYMENT FOR WORK.

Should any dispute arise respecting whether any delay is excusable, or its duration, or the value of the Work done, or of any Work omitted, or of any extra Work which CONTRACTOR may be required to do, or respecting any payment to CONTRACTOR during the performance of this Agreement, such dispute shall be decided by the Project Manager, and his or her decisions shall be final and binding upon CONTRACTOR and its sureties.

13. SUPERINTENDENCE BY CONTRACTOR.

At all times during performance of the Work, CONTRACTOR shall give personal superintendence or have a competent foreman or superintendent on the worksite, with authority to act for CONTRACTOR.

14. INSPECTION BY CITY.

CONTRACTOR shall at all times maintain proper facilities and provide safe access for inspection by CITY to all parts of the Work and to all shops on or off-site where the Work or portions of the Work, are in preparation. CITY shall have the right of access to the premises for inspection at all times. However, CITY shall, at all times, comply with CONTRACTOR's safety requirements on the job site.

15. CARE OF THE WORK AND OFF-SITE AUTHORIZATION.

CONTRACTOR warrants that it has examined the site of the Work and is familiar with its topography and condition, location of property lines, easements, building lines and other physical factors and limitations affecting the performance of this Agreement. CONTRACTOR, at CONTRACTOR's sole cost and expense, shall obtain any permission, and all approvals, licenses, or easements necessary for any operations conducted off the premises owned or controlled by CITY. CONTRACTOR shall be responsible for the proper care and protection of all materials delivered to the site or stored off-site and for

SAMPLE

the Work performed until completion and final inspection and acceptance by CITY. The risk, damage or destruction of materials delivered to the site or to Work performed shall be borne by CONTRACTOR.

16. PAYMENTS TO CONTRACTOR.

On or before the last Monday of each and every month during the performance of the Work, CONTRACTOR shall meet with the Project Manager or his or her designee to determine the quantity of pay items incorporated into the improvement during that month. A “Progress Payment Order” will then be jointly prepared, approved, and signed by the Project Manager and the CONTRACTOR setting forth the amount to be paid and providing for a five percent (5%) retention. Upon approval of the progress payment order by the Project Manager, or his or her designee, it shall be submitted to CITY’s Finance Department and processed for payment by obtaining approval from the City Council to issue a warrant.

Within three (3) days following City Council’s approval to issue a warrant, CITY shall mail to CONTRACTOR a warrant for the amount specified in the progress payment order as the amount to be paid. The retained five percent (5%) shall be paid to CONTRACTOR thirty-five (35) days after the recording of the Notice of Completion of the Work by the COUNTY and after CONTRACTOR shall have furnished releases of all claims against CITY by persons who furnished labor or materials for the Work, if required by CITY.

Upon the request of CONTRACTOR and at its expense, securities equivalent to the amount withheld pursuant to the foregoing provisions may be presented to CITY for substitution for the retained funds. If CITY approves the form and amount of the offered securities it will release the retained funds and will hold the securities in lieu thereof. CONTRACTOR shall be entitled to any interest earned on the securities.

SAMPLE

In the event that claims for property damage or bodily injury are presented to CITY arising out of CONTRACTOR's or any subcontractor's Work under this Agreement; CITY shall give notice thereof to CONTRACTOR, and CONTRACTOR shall have thirty-five (35) days from the mailing of any such notice to evaluate the claim and to settle it by whole or partial payment, or to reject it, and to give notice of settlement or rejection to CITY. If CITY does not receive notice within the above-mentioned 35-day period that the claim has been settled, and if the Project Manager, after consultation with the City Attorney, determines that the claim is meritorious, CITY may pay the claim or a portion of it in exchange for an appropriate release from the claimant, and may deduct the amount of the payment from the retained funds that would otherwise be paid to CONTRACTOR upon completion of the Work; provided, however, that the maximum amount paid for any one claim pursuant to this provision shall be One Thousand Dollars ($1,000.00), and the maximum amount for all such claims in the aggregate paid pursuant to this provision shall be Five Thousand Dollars ($5,000.00).

17. PROMPT PAYMENT OF SUBCONTRACTORS.

The CONTRACTOR agrees to pay each subcontractor under this Agreement for satisfactory performance of its contract no later than seven (7) days from the receipt of each payment the CONTRACTOR receives from CITY.

The CONTRACTOR agrees further to release retainage payments to each subcontractor within thirty (30) days after the subcontractor's work is satisfactorily completed.

Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the CITY.

18. CONTRACT SECURITY AND GUARANTEE.

Unless previously provided by CONTRACTOR to CITY, CONTRACTOR shall

SAMPLE

furnish, concurrently with the execution of this Agreement, the following: (1) a surety bond in an amount equal to one hundred percent (100%) of the contract price as security for the faithful performance of this Agreement, and (2) a separate surety bond in an amount equal to at least one hundred percent (100%) of the contract price as security for the payment of all persons furnishing labor or materials in connection with the Work under this Agreement. Sureties for each of the bonds and the forms thereof shall be satisfactory to CITY. In addition, such sureties must be authorized to issue bonds in California; sureties must be listed on the latest revision to the U.S. Department of the Treasury Circular 570; and must be shown to have sufficient bonding capacity to provide the bonds required by the Contract Documents.

CONTRACTOR shall provide a certified copy of the certificate of authority of the surety issued by the Insurance Commissioner; a certificate from the clerk of the county in which the court or officer is located that the certificate of authority of the surety has not been surrendered, revoked, canceled, annulled, or suspended or, in the event that it has, that renewed authority has been granted; and copies of the surety's most recent annual statement and quarterly statement filed with the Department of Insurance pursuant to Article 10 (commencing with Section 900) of Chapter 1 of Part 2 of Division 1 of the Insurance Code.

CONTRACTOR guarantees that all materials used in the Work and all labor performed shall be in conformity with the Contract Documents including, but not limited to, the standards and specifications set forth in the most current edition of The Greenbook. CONTRACTOR shall, at its own expense, make any and all repairs and replacements that shall become necessary as the result of any failure of the Work to conform to the aforementioned Contract Documents, and standard specifications; provided, however, that CONTRACTOR shall be obligated under this provision only to the extent of those

SAMPLE

failures or defects of which he is given notice within a period of twelve (12) months from the date that the Notice of Completion is recorded.

The rights and remedies available to CITY pursuant to this provision shall be cumulative with all rights and remedies available to CITY pursuant to statutory and common law, which rights and remedies are hereby expressly reserved, and neither the foregoing guarantee by CONTRACTOR nor its furnishing of the Bonds, nor acceptance thereof by CITY, shall constitute a waiver of any rights or remedies available to CITY against CONTRACTOR.

19. INDEMNIFICATION.

CONTRACTOR agrees to protect, defend, indemnify and hold harmless CITY and its elected and appointed boards, officers, agents, and employees from any and all claims, liabilities, expenses, or damages of any nature, including attorney fees, for injury to or death of any person, and for injury or damage to any property, including consequential damages of any nature resulting therefrom, arising out of or in any way connected with the performance of this Agreement. The defense obligation provided for hereunder shall apply without any advance showing of negligence or wrongdoing by the CONTRACTOR, its employees, and/or authorized subcontractors, but shall be required whenever any claim, action, complaint, or suit asserts as its basis the negligence, errors, omissions or misconduct of the CONTRACTOR, its employees, and/or authorized subcontractors, and/or whenever any claim, action, complaint or suit asserts liability against the CITY, its elected officials, officers, agents and employees based upon the work performed by the CONTRACTOR, its employees, and/or authorized subcontractors under this Agreement, whether or not the CONTRACTOR, its employees, and/or authorized subcontractors are specifically named or otherwise asserted to be liable. Notwithstanding the foregoing, the CONTRACTOR shall not be liable for the defense or

SAMPLE

indemnification of the CITY for claims, actions, complaints or suits arising out of the sole active negligence or willful misconduct of the CITY. This provision shall supersede and replace all other indemnity provisions contained either in the CITY's specifications or CONTRACTOR's proposal, which shall be of no force and effect.

CONTRACTOR shall comply with all of the provisions of the Workers' Compensation insurance laws and Safety in Employment laws of the State of California, including the applicable provisions of Divisions 4 and 5 of the California Labor Code and all amendments thereto and regulations promulgated pursuant thereto, and all similar State, Federal or local laws applicable; and CONTRACTOR shall indemnify and hold harmless CITY from and against all claims, liabilities, expenses, damages, suits, actions, proceedings and judgments, of every nature and description, including attorney fees, that may be presented, brought or recovered against CITY for or on account of any liability under or failure to comply with any of said laws which may be incurred by reason of any Work performed under this Agreement by CONTRACTOR or any subcontractor or others performing on behalf of CONTRACTOR.

CITY does not, and shall not, waive any rights against CONTRACTOR which it may have by reason of the above hold harmless agreements, because of the acceptance by CITY or the deposit with CITY by CONTRACTOR of any or all of the insurance policies described in Paragraph 20 (Insurance) of this Agreement.

The hold harmless agreements by CONTRACTOR shall apply to all liabilities, expenses, claims, and damages of every kind (including but not limited to attorney fees) incurred or alleged to have been incurred, by reason of the operations of CONTRACTOR or any subcontractor or others performing on behalf of CONTRACTOR, whether or not such insurance policies are applicable. CONTRACTOR shall require any and all tiers of subcontractors to afford the same degree of indemnification to the CITY OF COSTA

SAMPLE

MESA and its elected and appointed boards, officers, agents, and employees that is required of CONTRACTOR and shall incorporate identical indemnity provisions in all contracts between CONTRACTOR and all tiers of its subcontractors.

In the event that CONTRACTOR and CITY are sued by a third party for damages caused or allegedly caused by negligent or other wrongful conduct of CONTRACTOR, or by a dangerous condition of CITY's property created by CONTRACTOR or existing while the property was under the control of CONTRACTOR, CONTRACTOR shall not be relieved of its indemnity obligation to CITY by any settlement with any such third party unless that settlement includes a full release and dismissal of all claims by the third party against the CITY.

20. INSURANCE.

CONTRACTOR shall not commence Work under this Agreement until it has obtained all insurance required under this section and CITY has approved the insurance as to form, amount, and carrier, nor shall CONTRACTOR allow any subcontractor to commence any Work until all similar insurance required of the subcontractor has been obtained and approved.

Neither the failure of CONTRACTOR to supply specified insurance policies and coverage, nor the failure of CITY to approve same shall alter or invalidate the provisions of Paragraph 19 (Indemnification) of this Agreement.

(a) Workers' Compensation Insurance.

CONTRACTOR shall obtain and maintain during the life of this Agreement workers' compensation insurance and, if any Work is sublet, CONTRACTOR shall require all tiers of subcontractors to obtain workers' compensation insurance.

All workers' compensation insurance policies shall provide that the insurance may not be canceled without thirty (30) days' advance written notice of such

SAMPLE

cancellation to CITY.

CONTRACTOR agrees to waive, and obtain endorsements from its workers' compensation insurer waiving, subrogation rights under its workers' compensation insurance policy against the CITY and to require each of its subcontractors, if any, to do likewise under their workers' compensation insurance policies.

(b) Liability Insurance Coverage.

CONTRACTOR shall obtain and maintain during the life of this Agreement the following insurance coverage:

(i) Commercial General Liability, including coverage for premises-operations, products/completed operations hazard, blanket contractual, broad form property damage, and independent contractors. In addition, CONTRACTOR shall obtain and maintain during the life of this Agreement each of the following insurance coverage which are not stricken out and initialed by the Project Manager: Explosion and collapse hazard, underground hazard, personal injury, and automobile liability, including owned, hired, and non-owned vehicles. All insurance coverage shall have limits of not less than $1,000,000.00 combined single limits, per occurrence and aggregate.

(ii) Below are approved endorsements which satisfy the basic insurance requirements contained in contracts entered into by City of Costa Mesa. These have been approved by the City Attorney's Office. The terms of any specific contract with the City are controlling. Prior to the commencement of any work, the City requires that the Engineer receive Certificates of Insurance in DUPLICATE for liability coverage of at least $1,000,000.00 combined single limits, per occurrence and in the aggregate. Endorsements to the policies providing the above insurance shall be obtained by CONTRACTOR, adding the following three provisions:

(1) Additional Insured:

SAMPLE

"The City of Costa Mesa and its elected and appointed boards, officers, agents, and employees are additional insureds with respect to the subject project and agreement."

(2) Notice:

"Said policy shall not terminate, nor shall it be canceled nor the coverage reduced, until thirty (30) days after written notice is given to CITY."

(3) Other Insurance:

"Any other insurance maintained by the City of Costa Mesa shall be excess and not contributing with the insurance provided by this policy."

If any of such policies provide for a deductible or self-insured retention to provide such coverage, the amount of such deductible or self-insured retention shall be approved in advance by CITY. No policy of insurance issued as to which the CITY is an additional insured shall contain a provision which requires that no insured except the named insured can satisfy any such deductible or self-insured retention.

21. PROOF OF INSURANCE.

Prior to commencement of the Work, CONTRACTOR shall furnish CITY, through the Project Manager, proof of compliance with the above insurance requirements in a form satisfactory to the Risk Management.

22. LEGAL WORK DAY - PENALTIES FOR VIOLATION.

Eight (8) hours of labor shall constitute a legal day's work during any one (1) calendar day. CONTRACTOR shall forfeit to CITY the sum of Twenty-Five Dollars ($25.00) for each workman employed in the execution of this Agreement by CONTRACTOR or by any subcontractor for each calendar day during which such workman is required or permitted to work more than eight (8) hours in any one calendar day and 40 hours in any one calendar week in violation of California Labor Code Sections

SAMPLE

1810 through 1815, inclusive.

23. PREVAILING WAGE SCALE.

CONTRACTOR shall comply in all respects with the Davis-Bacon Act (40 U.S.C. section 276a) and with California Labor Code sections 1770 et seq., including the keeping of all records required by the provisions of Labor Code section 1776.

CONTRACTOR shall furnish each week to CITY's Project Administration Division a statement with respect to the wages of each of its employees during the preceding weekly payroll period.

24. COMPLIANCE WITH ALL LAWS.

CONTRACTOR shall, at its own cost and expense, comply with all applicable local, state, and federal laws, regulations, and requirements in the performance of this Agreement, including but not limited to laws regarding health and safety, labor and employment, and wage and hours.

25. DRUG-FREE WORKPLACE POLICY.

CONTRACTOR, upon notification of the award of this Agreement, shall establish a Drug-Free Awareness Program to inform employees of the dangers of drug abuse in the workplace, the penalties that may be imposed upon employees for drug abuse violations occurring in the workplace, and the employee assistance programs available to employees. Each employee engaged in the performance of a CITY contract must be notified of this Drug-Free Awareness Program, and must abide by its terms. CONTRACTOR shall conform to all the requirements of CITY's Policy No. 100-5, attached hereto as Attachment 1. Failure to establish a program, notify employees, or inform the CITY of a drug-related workplace conviction will constitute a material breach of contract and cause for immediate termination of the contract by the CITY.

SAMPLE

26. NON–DISCRIMINATION.

In performing this Agreement, CONTRACTOR will not engage in, nor permit its agents to engage in, discrimination in employment of persons because of their race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status or sex, or sexual orientation, except as permitted pursuant to Section 12940 of the Government Code. Violation of this provision may result in the imposition of penalties referred to in Section 1735 of the California Labor Code.

27. CONTRACT ASSURANCE.

The CONTRACTOR or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. The CONTRACTOR shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the CONTRACTOR to carry out these requirements is a material breach of this Agreement, which may result in the termination of this Agreement or such other remedy as recipient deems appropriate.

The CONTRACTOR will require that the above provision is included in all subcontracts.

28. PROVISIONS CUMULATIVE.

The provisions of this Agreement are cumulative and in addition to, and not in limitation of, any other rights or remedies available to CITY.

29. NOTICES.

It shall be the duty and responsibility of CONTRACTOR to notify all tiers of subcontractors and material men of the following special notice provision; namely, all preliminary 20-day notices or stop notices shall be directed only to the City Clerk and to no other department, and shall be either personally delivered or sent by certified mail, postage prepaid.

SAMPLE

All other notices shall be in writing and delivered in person or sent by certified mail, postage prepaid. Notices required to be given to CITY pursuant to this Agreement shall be addressed as follows:

City of Costa Mesa
77 Fair Drive
Costa Mesa, CA 92626
Attn: _____

Notices required to be given to CONTRACTOR shall be addressed as follows:

_____
_____
_____
Attn: _____

Notices required to be given to CONTRACTOR's sureties shall be addressed as follows:

_____
_____
_____
Attn: _____

30. INDEPENDENT CONTRACTOR.

The parties hereto acknowledge and agree that the relationship between CITY and CONTRACTOR is one of principal and independent contractor and no other. All personnel to be utilized by CONTRACTOR in the performance of this Agreement shall be employees of CONTRACTOR and not employees of the CITY. CONTRACTOR shall pay all salaries and wages, employer's social security taxes, unemployment insurance and similar taxes relating to employees and shall be responsible for all applicable withholding taxes. Nothing contained in this Agreement shall create or be construed as creating a partnership, joint venture, employment relations, or any other relationship except as set forth between the parties. The parties specifically acknowledge and agree that CONTRACTOR is not a partner with CITY, whether general or limited, and no activities of CITY or CONTRACTOR or statements made by CITY or CONTRACTOR shall be

SAMPLE

interpreted by any of the parties hereto as establishing any type of business relationship other than an independent contractor relationship.

31. PERS ELIGIBILITY INDEMNIFICATION.

In the event that CONTRACTOR or any employee, agent, or subcontractor of CONTRACTOR providing services under this Agreement claims or is determined by a court of competent jurisdiction or the California Public Employees' Retirement System (PERS) to be eligible for enrollment in PERS as an employee of the CITY, CONTRACTOR shall indemnify, defend, and hold harmless CITY for the payment of any employee and/or employer contributions for PERS benefits on behalf of CONTRACTOR or its employees, agents, or subcontractors, as well as for the payment of any penalties and interest on such contributions, which would otherwise be the responsibility of CITY.

Notwithstanding any other agency, state or federal policy, rule, regulation, law or ordinance to the contrary, CONTRACTOR and any of its employees, agents, and subcontractors providing service under this Agreement shall not qualify for or become entitled to, and hereby agree to waive any claims to, any compensation, benefit, or any incident of employment by CITY, including but not limited to eligibility to enroll in PERS as an employee of CITY and entitlement to any contribution to be paid by CITY for employer contribution and/or employee contributions for PERS benefits.

32. VALIDITY.

The invalidity in whole or in part of any provision of this Agreement shall not void or affect the validity of any of the other provisions of this Agreement.

33. GOVERNING LAW.

This Agreement shall be governed by and construed in accordance with the laws of the State of California. Any legal action relating to or arising out of this Agreement shall be subject to the jurisdiction of the County of Orange, California.

SAMPLE

34. NO THIRD PARTY BENEFICIARY RIGHTS.

This Agreement is entered into for the sole benefit of the CITY and CONTRACTOR and no other parties are intended to be direct or incidental beneficiaries of this Agreement and no third party shall have any right in, under or to this Agreement.

35. ASSIGNABILITY.

This Agreement may not be sold, transferred or assigned by either party, or by operation of law, to any other person or persons or business entity, without the other party's written permission. Any such sale, transfer or assignment, or attempted sale, transfer or assignment without written permission, may be deemed by the other party to constitute a voluntary termination of this Agreement and this Agreement shall thereafter be deemed terminated and void.

36. WAIVER.

No waiver of any provision of this Agreement shall be effective unless in writing and signed by a duly authorized representative of the party against whom enforcement of a waiver is sought referring expressly to this Paragraph. The waiver of any right or remedy in respect to any occurrence or event shall not be deemed a waiver of any right or remedy in respect to any other occurrence or event, nor shall any waiver constitute a continuing waiver.

37. HEADINGS.

Section and subsection headings are not to be considered part of this Agreement, are included solely for convenience, and are not intended to modify or explain or to be a full or accurate description of the content thereof.

38. COUNTERPARTS.

This Agreement may be executed in one or more counterparts by the parties hereto. All counterparts shall be construed together and shall constitute one Agreement.

SAMPLE

39. CORPORATE AUTHORITY.

The persons executing this Agreement on behalf of the Parties hereto warrant that they are duly authorized to execute this Agreement on behalf of said Parties and that by doing so, the Parties hereto are formally bound to the provisions of this Agreement.

40. ADDITIONAL SERVICES.

CONTRACTOR shall not receive compensation for any services provided outside the scope of the Contract Documents unless such additional services, including change orders, are approved in writing by CITY prior to CONTRACTOR performing the additional services.

It is specifically understood that oral requests or approvals of such additional services, change orders or additional compensation and any approvals from CITY shall be barred and are unenforceable.

[Signatures appear on following page.]

SAMPLE

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed by and through their respective authorized officers, as of the date first above written.

CITY OF COSTA MESA,
A municipal corporation

_____ Date: _____
Lori Ann Farrell Harrison
City Manager

CONTRACTOR

_____ Date: _____
Signature

_____
Name and Title

_____ Date: _____
Signature

_____
Name and Title

_____
Social Security or Taxpayer ID Number

ATTEST:

_____ Date: _____
Brenda Green
City Clerk

APPROVED AS TO FORM:

_____ Date: _____
Kimberly Hall Barlow
City Attorney

SAMPLE

APPROVED AS TO INSURANCE:

_____ Date: _____
Ruth Wang
Risk Management

APPROVED AS TO PURCHASING:

_____ Date: _____
Carol Molina
Finance Director

DEPARTMENTAL APPROVAL:

_____ Date: _____
Raja Sethuraman
Public Works Director

_____ Date: _____
Robert Ryan
Maintenance Services Manager

SAMPLE

CITY OF COSTA MESA, CALIFORNIA

COUNCIL POLICY

SUBJECT	POLICY NUMBER	EFFECTIVE DATE	PAGE
DRUG-FREE WORKPLACE	100-5	8-8-89	1 of 3

BACKGROUND

Under the Federal Drug-Free Workplace Act of 1988, passed as part of omnibus drug legislation enacted November 18, 1988, contractors and grantees of Federal funds must certify that they will provide drug-free workplaces. At the present time, the City of Costa Mesa, as a sub-grantee of Federal funds under a variety of programs, is required to abide by this Act. The City Council has expressed its support of the national effort to eradicate drug abuse through the creation of a Substance Abuse Committee, institution of a City-wide D.A.R.E. program in all local schools and other activities in support of a drug-free community. This policy is intended to extend that effort to contractors and grantees of the City of Costa Mesa in the elimination of dangerous drugs in the workplace.

PURPOSE

It is the purpose of this Policy to:

1. Clearly state the City of Costa Mesa's commitment to a drug-free society.

2. Set forth guidelines to ensure that public, private, and nonprofit organizations receiving funds from the City of Costa Mesa share the commitment to a drug-free workplace.

POLICY

The City Manager, under direction by the City Council, shall take the necessary steps to see that the following provisions are included in all contracts and agreements entered into by the City of Costa Mesa involving the disbursement of funds.

1. Contractor or Sub-grantee hereby certifies that it will provide a drug-free workplace by:

   A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in Contractor's and/or sub-grantee's workplace, specifically the job site or location included in this contract, and specifying the actions that will be taken against the employees for violation of such prohibition;

   B. Establishing a Drug-Free Awareness Program to inform employees about:

SUBJECT	POLICY NUMBER	EFFECTIVE DATE	PAGE
DRUG-FREE WORKPLACE	100-5	8-8-89	2 of 3

1. The dangers of drug abuse in the workplace;

2. Contractor's and/or sub-grantee's policy of maintaining a drug-free workplace;

3. Any available drug counseling, rehabilitation and employee assistance programs; and

4. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

C. Making it a requirement that each employee to be engaged in the performance of the contract be given a copy of the statement required by subparagraph A;

D. Notifying the employee in the statement required by subparagraph 1 A that, as a condition of employment under the contract, the employee will:

1. Abide by the terms of the statement; and

2. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;

E. Notifying the City of Costa Mesa within ten (10) days after receiving notice under subparagraph 1 D 2 from an employee or otherwise receiving the actual notice of such conviction;

F. Taking one of the following actions within thirty (30) days of receiving notice under subparagraph 1 D 2 with respect to an employee who is so convicted:

1. Taking appropriate personnel action against such an employee, up to and including termination; or

2. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health agency, law enforcement, or other appropriate agency;

G. Making a good faith effort to maintain a drug-free workplace through implementation of subparagraphs 1 A through 1 F, inclusive.

2. Contractor and/or sub-grantee shall be deemed to be in violation of this Policy if the City of Costa Mesa determines that:

   a. Contractor and/or sub-grantee has made a false certification under paragraph 1 above;

   b. Contractor and/or sub-grantee has violated the certification by failing to carry out the requirements of subparagraphs 1 A through 1 G above;

   c. Such number of employees of Contractor and/or sub-grantee have been convicted of violations of criminal drug statutes for violations occurring in the workplace as to indicate that the contractor and/or sub-grantee has failed to make a good faith effort to provide a drug-free workplace.

3. Should any contractor and/or sub-grantee be deemed to be in violation of this Policy pursuant to the provisions of 2 A, B, and C, a suspension, termination or debarment proceeding subject to applicable Federal, State, and local laws shall be conducted. Upon issuance of any final decision under this section requiring debarment of a contractor and/or sub-grantee, the contractor and/or sub-grantee shall be ineligible for award of any contract, agreement or grant from the City of Costa Mesa for a period specified in the decision, not to exceed five (5) years. Upon issuance of any final decision recommending against debarment of the contractor and/or sub-grantee, the contractor and/or sub-grantee shall be eligible for compensation as provided by law.

LABOR AND MATERIALS PAYMENT BOND
TO ACCOMPANY CONTRACT PUBLIC WORK

WHEREAS, the City of Costa Mesa, State of California, has awarded to _____, hereinafter designated as the "Principal", a contract for the project known as: _____ in the City of Costa Mesa, in strict conformity with the contract on file with the Costa Mesa City Clerk, which is incorporated herein by this reference.

WHEREAS, Principal has executed or is about to execute the contract and the terms thereof and California Civil Code section 9554 require the furnishing of a bond, providing that if Principal or any of Principal's subcontractors fails to pay for any materials, provisions, or other supplies used in, upon, for, or about the performance of the work agreed to be done, or for any work or labor done thereon of any kind, the Surety on this bond will pay the same to the extent hereinafter set forth.

NOW, THEREFORE, We, the undersigned Principal, and _____, duly authorized to transact business under the laws of the State of California, as Surety (referred to herein as "Surety"), are held and firmly bound unto the City of Costa Mesa, in the sum of _____ Dollars ($_____) lawful money of the United States of America, said sum being equal to 100% of the estimated amount payable to the City of Costa Mesa under the terms of the contract, for which payment well and truly to be made, we bind ourselves, our heirs, executors, executors, and administrators, successors and assigns, jointly and severally, firmly by these present.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Principal or the Principal's subcontractors fail to pay for any materials, provisions, or other supplies, implements or machinery used in, upon, for, or about the performance of the work contracted to be done, or for any other work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code with respect to such work or labor, or for any amounts required to be deducted, withheld and paid over to the Employment Development Department from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code with respect to such work and labor, then the Surety will pay for the same, in an amount not exceeding the sum specified in this Bond, and also, in case suit is brought to enforce the obligations of this Bond, a reasonable attorneys' fees, to be fixed by the Court as required by the provisions of Section 9554 of the California Civil Code.

This bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Section 9100 of the California Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond. And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the above-named Principal and Surety, on the _____ day of _____, 20____.

_____	_____
Name of Contractor (Principal)	Authorized Signature/Title
_____	_____
Name of Surety	Authorized Agent Signature
_____	_____
Address of Surety	Print Name and Title

FAITHFUL PERFORMANCE PAYMENT BOND
TO ACCOMPANY PUBLIC WORKS AGREEMENT

The premium charge on this bond is $_____, being at the rate of $_____ per thousand of the contract price.

WHEREAS, the City of Costa Mesa, State of California, has awarded to _____, hereinafter designated as the "Principal", a Public Works Agreement for the project known as: _____ in the City of Costa Mesa, in strict conformity with the Public Works Agreement on file with the Costa Mesa City Clerk, which is incorporated herein by this reference (the "Agreement").

WHEREAS, Principal has executed or is about to execute the Agreement and the terms thereof require the furnishing of a bond for the faithful performance of the Agreement.

NOW, THEREFORE, We, the undersigned Principal, and _____, duly authorized to transact business under the laws of the State of California, as Surety (referred to herein as "Surety"), are held and firmly bound unto the City of Costa Mesa, in the sum of _____ Dollars ($_____) lawful money of the United States of America, said sum being equal to 100% of the estimated amount payable by the City of Costa Mesa under the terms of the Agreement, for which payment well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these present.

The Surety's obligations under this Bond are commensurate with the obligations of the Principal under the Agreement. The Surety's obligations shall include, but are not limited to: (1) the responsibilities of Principal under the Agreement for completion of the Agreement and correction of defective work; (2) the responsibilities of Principal under the Agreement to pay any liquidated damages, and, for damages for which no liquidated damages are specified in the Agreement, actual damages caused by non-performance of the Agreement, including, but not limited to, all valid and proper backcharges, offsets, payments indemnities, or other damages; and (3) additional legal, design professional and delay costs resulting from Principal's default or failure to act of the Surety.

The condition of this obligation is such that if the Principal or the Principal's heirs, executors, administrators, successors or assigns, in all things stands to and abides by, and well and truly keeps and performs all of the work, covenants, conditions, and agreements in the Agreement and any alteration thereof made as therein provided on its part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and indemnifies, defends, and saves harmless the City of Costa Mesa, its officers, employees, and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As part of the obligation secured hereby, and in addition to the face amount specified in this Bond, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by the City in successfully enforcing the obligation.

The Surety, for value received, stipulates and agrees that no change, extension of time, or alterations or additions to the terms of the Agreement or to the work to be performed thereunder, or the specifications accompanying same, shall in any way affect its obligations on this Bond, and it hereby waives notice of any such change, extension of time, or alterations or additions to the Agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the above-named Principal and Surety, on the _____ day of _____, 20____.

_____	_____
Name of Contractor (Principal)	Authorized Signature/Title
_____	_____
Name of Surety	Authorized Agent Signature
_____	_____
Address of Surety	Print Name and Title

INSURANCE REQUIREMENT FOR CITY OF COSTA MESA

CONTRACTOR shall not commence Work under this Agreement until he has obtained all insurance required under this section and CITY has approved the insurance as to form, amount, and carrier, nor shall CONTRACTOR allow any subcontractor to commence any Work until all similar insurance required of the subcontractor has been obtained and approved.

Neither the failure of CONTRACTOR to supply specified insurance policies and coverage, nor the failure of CITY to approve same shall alter or invalidate the provisions of Paragraph 18 of this Agreement.

A. Workers' Compensation Insurance.

CONTRACTOR shall obtain and maintain during the life of this Agreement workers' compensation insurance and, if any Work is sublet, CONTRACTOR shall require all tiers of subcontractors to obtain workers' compensation insurance.

All workers' compensation insurance policies shall provide that the insurance may not be canceled without thirty (30) days' advance written notice of such cancellation to CITY.

CONTRACTOR agrees to waive, and obtain endorsements from its workers' compensation insurer waiving, subrogation rights under its workers' compensation insurance policy against the CITY and to require each of its subcontractors, if any, to do likewise under their workers' compensation insurance policies.

B. Liability Insurance Coverage.

CONTRACTOR shall obtain and maintain during the life of this Agreement the following insurance coverage:

(1) Commercial General Liability, including coverage for premises-operations, products/completed operations hazard, blanket contractual, broad form property damage, and independent contractors. In addition, CONTRACTOR shall obtain and maintain during the life of this Agreement each of the following insurance coverage which are not stricken out and initialed by the Project Manager: Explosion and collapse hazard, underground hazard, personal injury, and automobile liability, including owned, hired, and non-owned vehicles. All insurance coverage shall have limits of not less than $1,000,000.00 combined single limit, per occurrence and aggregate.

(2) Below are approved endorsements which satisfy the basic insurance requirements contained in contracts entered into by City of Costa Mesa. These have been approved by the City Attorney's office. The terms of any specific contract with the City are controlling. Prior to the commencement of any work, the City requires that the Engineer receive Certificates of Insurance in DUPLICATE for liability coverage of at lease $1,000,000 combined single limit, per occurrence and in the aggregate. Endorsements to the policies providing the above insurance shall be obtained by CONTRACTOR, adding the following three provisions:

(i) Additional Insured:

The City of Costa Mesa and their elected and appointed boards, officers, agents, employees, are additional insureds with respect to the subject project and agreement.

(ii) Notice:

"Said policy shall not terminate, nor shall it be canceled nor the coverage reduced, until thirty (30) days after written notice is given to CITY "

(iii) Other Insurance:

"Any other insurance maintained by the City of Costa Mesa shall be excess and not contributing with the insurance provided by this policy."

If any of such policies provide for a deductible or self-insured retention to provide such coverage, the amount of such deductible or self-insured retention shall be approved in advance by City. No policy of insurance issued as to which the City is an additional insured shall contain a provision which requires that no insured except the named insured can satisfy any such deductible or self-insured retention.

ATTACHMENT 2

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

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

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

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
INSURED	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

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

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$
	☐ CLAIMS-MADE ☐ OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$
							MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$
	☐ POLICY ☐ PRO-JECT ☐ LOC						PRODUCTS - COMP/OP AGG	$
	OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	☐ ANY AUTO						BODILY INJURY (Per person)	$
	☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	☐ HIRED AUTOS ☐ NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB ☐ OCCUR						EACH OCCURRENCE	$
	EXCESS LIAB ☐ CLAIMS-MADE						AGGREGATE	$
	☐ DED ☐ RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						☐ PER STATUTE ☐ OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☐ N / A **(Mandatory in NH)**						E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

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

SAMPLE

CERTIFICATE HOLDER	CANCELLATION
	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

© 1988-2014 ACORD CORPORATION. All rights reserved.

POLICY NUMBER: Enter General Liability Policy Number

COMMERCIAL GENERAL LIABILITY
CG 20 37 07 04

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – COMPLETED OPERATIONS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location And Description Of Completed Operations
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

Section II – Who Is An Insured is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury" or "property damage" caused, in whole or in part, by "your work" at the location designated and described in the schedule of this endorsement performed for that additional insured and included in the "products-completed operations hazard".

SAMPLE

 © ISO Properties, Inc., 2004

POLICY NUMBER: Enter General Liability policy number

COMMERCIAL GENERAL LIABILITY
CG 20 10 07 04

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – OWNERS, LESSEES OR CONTRACTORS – SCHEDULED PERSON OR ORGANIZATION

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s):	Location(s) Of Covered Operations
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.	

A. **Section II – Who Is An Insured** is amended to include as an additional insured the person(s) or organization(s) shown in the Schedule, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by:

1. Your acts or omissions; or
2. The acts or omissions of those acting on your behalf;

in the performance of your ongoing operations for the additional insured(s) at the location(s) designated above.

B. With respect to the insurance afforded to these additional insureds, the following additional exclusions apply:

This insurance does not apply to "bodily injury" or "property damage" occurring after:

1. All work, including materials, parts or equipment furnished in connection with such work, on the project (other than service, maintenance or repairs) to be performed by or on behalf of the additional insured(s) at the location of the covered operations has been completed; or
2. That portion of "your work" out of which the injury or damage arises has been put to its intended use by any person or organization other than another contractor or subcontractor engaged in performing operations for a principal as a part of the same project.

SAMPLE

 © ISO Properties, Inc., 2004 □

POLICY NUMBER: Enter General Liability Policy Number Here

COMMERCIAL GENERAL LIABILITY
CG 24 04 05 09

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY AGAINST OTHERS TO US

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART
PRODUCTS/COMPLETED OPERATIONS LIABILITY COVERAGE PART

SCHEDULE

Name Of Person Or Organization: ANY PERSON OR ORGRANIZATION FROM WHOM YOU ARE REQUIRED BY WRITTEN CONTRACT OR AGREEMENT TO OBTAIN THIS WAIVER OF RIGHTS FROM US.
Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

The following is added to Paragraph **8. Transfer Of Rights Of Recovery Against Others To Us** of **Section IV – Conditions:**

We waive any right of recovery we may have against the person or organization shown in the Schedule above because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "products-completed operations hazard". This waiver applies only to the person or organization shown in the Schedule above.

SAMPLE

 © Insurance Services Office, Inc., 2008

ATTACHMENT 2

WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE POLICY **WC 04 03 06**

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT - CALIFORNIA

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

You must maintain payroll records accurately segregating the remuneration of your employees while engaged in the work described in the Schedule.

The additional premium for this endorsement shall be 2% of the California workers' compensation premium otherwise due on such remuneration.

SCHEDULE

PERSON OR ORGANIZATION	**JOB DESCRIPTION**
ANY PERSON OR ORGANIZATION FOR WHOM THE NAMED INSURED HAS AGREED BY WRITTEN CONTRACT TO FURNISH THIS WAIVER	BLANKET WAIVER OF SUBROGATION

SAMPLE

This endorsement changes the policy to which it is attached and is effective on the date issued unless otherwise stated.
(The information below is required only when this endorsement is issued subsequent to preparation of the policy.)

Endorsement Effective: XX/**XX/2014** Policy No. **ENTER** Endorsement No. **001**

Insured: Contractors Name

Premium $ INCL.

Insurance Company: **Insurance Company**

Countersigned By: _____

- 1998 by the Workers' Compensation Insurance Rating Bureau of California. All rights reserved.
From the WCIRB's California Workers' Compensation Insurance Forms Manual - 1999.

City of Costa Mesa, Department of Public Services

Application and Permit for Work Described Below

PERMIT NO. ____

VENDOR NO. ____

Address or Location of Work _____ Date _____

Type of Work to be Done _____

_____

Start Date _____ Permit Not Valid After _____ (Expiration Date) Plan No. _____

Contractor's Name _____ Address _____

Telephone No. (Day) _____ (Night) _____ City and State _____

State License No./Class _____ City Business License No. _____

Applicant's Name _____ Address _____

Telephone No. _____ Developer's Name _____ Telephone No. _____

Name of Insurance Co. _____ Insurance Cert. No.(s) _____

24-Hour Emergency Contact _____ Telephone No. _____

FEES	48 HOURS MINIMUM REQUIRED FOR PROCESSING PERMIT	PERMIT APPROVED FOR CITY ENGINEER
Bond $ _____		By _____
Cash Deposit $ _____		Date _____
Issuance $ _____	Account # ____	
Inspection $ _____		Underground Service Alert ID No. _____
TOTAL $ _____		

Permittee shall contact the City Inspector's office (**754-5025**) at least 24 hours prior to commencing any work. Failure to obtain proper inspections prior to commencement of work may be cause for its rejection. **THIS PERMIT WITH APPROVED PLANS MUST BE ON THE JOB AND AVAILABLE TO CITY REPRESENTATIVES AT ALL TIMES**. You are guided by Municipal Code Sections 1-33, 15 -25-,15-27, 15-27.1, 15-39 and 15-48.

THE UNDERSIGNED PERMITTEE HEREBY CERTIFIES:

1. **That all work shall be performed in accordance with the Standard Specifications for Public Works Construction** (latest edition); Standard Drawings of the City of Costa Mesa; special agency provisions; and all applicable laws and ordinances.
2. Control of traffic shall conform to the **Work Area Traffic Control Handbook** (W.A.T.C.H.) (latest edition). The permittee shall furnish and/or install all signs, lights, barricades, traffic control or warning devices, flagmen and flashing arrow board. The permittee shall obtain approval of the Transportation Services Engineer for all street closures, detours, turn restrictions, parking prohibitions and methods of accommodating traffic. The permittee shall notify Emergency, Fire and Police services and residents or businesses twenty-four (24) hours in advance of any access limitation or traffic restrictions.
3. That a maximum of _____ lane(s) may be closed if necessary to perform work within the public right of way during the hours of **8:30 a.m. - 3:30 p.m. Monday through Friday** as long as traffic can be maintained in each direction with flagmen unless otherwise approved by the Transportation Services Engineer.
4. That throughout all phases of construction the work site shall be kept clean and free of rubbish, debris and dust and drainage shall be maintained.

SUBJECT TO THE NOTES BELOW: (Inspection fees over the basic inspection time will be billed at the approved hourly rate.)

1. City will provide inspection between 7:30 a.m. and 3:00 p.m., Monday through Friday (except on City observed holidays).
2. Prior to placing Portland Cement Concrete or Asphalt Concrete (A.C.), the following will have been inspected and approved; native ☐ and imported ☐.
3. **Curb and gutter shall not be removed on the day prior to a weekend or a City observed holiday.**
4. Fill in areas left by curb and gutter removal flush with the adjacent pavement on the same day that removal occurs.
5. Bore under all streets, curbs and gutters, sidewalks, cross-gutters and driveway approaches. Tunneling is not allowed.
6. Open excavations must be backfilled or plated with spikes and A.C. tacked around edges during non-working hours.
7. Sidewalk shall be constructed per City of Costa Mesa Standard Drawing No. _____.
8. Driveway approach shall be constructed per City of Costa Mesa Standard Drawing No. _____.
9. No traffic allowed on concrete for minimum of seven days for curing. See traffic control above.
10. Trench compaction and resurfacing shall conform to City of Costa Mesa Standard Drawing No. 813.
11. Trenches exceeding five (5) feet in depth require a permit from the Division of Industrial Safety, State of California.
12. Permittee shall pay for all S.E., compaction and materials tests deemed necessary by the City.
13. All trenches shall be permanently patched within ten (10) days of completion of work below subgrade.
14. Permittee shall provides the City with record drawings of permitted work before final inspection by the City.
15. Permittee understands and agrees to the hold-harmless agreement required by CMMC Section 15-27 and printed on the reverse of this application.
16. Other: _____

_____

NOTICE: Contractor must notify the following Utility Companies two working days before starting work:

Costa Mesa Sanitary District	Mesa Consolidated Water District	UNDERGROUND SERVICE ALERT
(714) 631-1731	714) 631-1200	Toll Free - 1-800-422-4133; After Hours & Holidays - (714) 739-3031; (213) 621-3111

INSPECTION RECORD	Inspector of Records
Date	

CERTIFICATE OF INSPECTION

I hereby certify that the street work allowed by this permit has been constructed according to the plans and specifications and I hereby accept the work in this manner.

By: _____
Inspector

_____
Date

0183-62 mw, rev. 2/03
White - Inspectors;
Canary - Engineering;
Pink - Finance
Goldenrod - Applicant

I certify I have read and understand all of the above and that all statements made are correct and complete.

Applicant's Signature _____ Date _____

3 COPIES OF SKETCHES OR PLANS ARE REQUIRED PRIOR TO PERMIT ISSUANCE

THIS APPLICATION BECOMES A PERMIT WHEN APPROVED AND VALIDATED

APPLICATION FOR BUSINESS LICENSE

SEND YOUR CHECK MADE PAYABLE TO THE CITY OF COSTA MESA
TREASURY MANAGEMENT DIVISION, PO BOX 1200, COSTA MESA, CA 92628-1200
(714) 754-5234 TDD: (714) 754-5244

Business Name _____

Parent Company Name _____
(If Corporate Owned)

Note: Business address will be compared to zoning requirements before approval. Check with the Planning Division regarding the use of the location at (714) 754-5245.

Business Address _____
(Cannot be a P.O. Box) **Street #** **Street name** **Unit #** **City** **State** **Zip**

Mailing Address _____
(Can be a P.O. Box) **Street #** **Street name** **Unit #** **City** **State** **Zip**

Business Telephone # (____)_____ **Business Start Date** _____ **No. of Employees (on average)** _____

Ownership (Check One only)
☐ Sole Owner ☐ Corporation ☐ Partnership ☐ Husband & Wife Co-ownership ☐ Limited Liability Company
☐ Limited Liability Partnership

Seller's Permit No. _____ **Contractors State No. & Class** _____
(If Applicable) **(If Applicable)**

Federal Employer ID # or, Owner's Social Security # _____ **Federal Firearms License #** (if applicable) _____

OWNER'S OR PRINCIPAL'S NAME(S)

Name _____ **Name** _____
Home Address _____ **Home Address** _____
City _____ **Zip**_____ **City** _____ **Zip**_____
Telephone # (____)_____ **Title** _____ **Telephone #** (____)_____ **Title** _____
Drivers License No._____ **Date of Birth**_____ **Drivers License No.**_____ **Date of Birth**_____

TYPE OF BUSINESS

PLEASE CIRCLE ONE: Wholesale/Retail/Manufacturing/Services/Non-Profit/Administrative Only/Warehouse/ Other

Fully Describe Business Operation: _____

_____

_____ **Standard Industrial Class Code (SIC)** _____

Alcohol Beverage Control Permit No. _____
(If Applicable)

Department of Motor Vehicles Permit # _____
(Required for automobile/motorcycle sales businesses)

Hours of Operation (M-F) _____ **(S-SU)** _____
(Commercial/Industrial only)

Number of Rental Units/Rooms/Spaces _____
(If Applicable)

CHOOSE ONE OF THE APPROPRIATE FEES BELOW

GENERAL BUSINESS
(wholesale, retail, professional, Etc.)

Enter Annual Gross Receipts Amount $_____

And Circle the corresponding category below

Annual Gross Receipts			Tax
$0.00	to	1,000.00	$0.00
$1,000.01	to	25,000.00	$25.00
$25,000.01	to	40,000.00	$35.00
$40,000.01	to	75,000.00	$45.00
$75,000.01	to	200,000.00	$60.00
$200,000.01	to	500,000.00	$100.00
Over		$500,000.00	$200.00

CONTRACTOR
(California Licensed) **Total tax due $50.00**

TAX EXEMPT ORGANIZATIONS
Attach proof of Tax Exempt Status (required for waiver of tax due)

SHOW, EXHIBITION, SWAP MEET **Tax on the Promoter's Gross Receipts from the Gross Receipts schedule to the left** .....
.....**Enter the tax due amount here $**_____
PLUS .....**(# of sellers** _____**x $5 = $**_____**)**
EQUALS .....**Total tax due $**_____

ADMINISTRATIVE OFFICES/WAREHOUSES
(Fees based on annual operating expenses when no receipts generated)
Enter annual operating expenses amount $_____
Use Gross Receipts schedule to the left to determine business license tax.

VEHICLE WHEEL, TAXI, TOW TRUCK, BUS

Number of Vehicles:_____ **x $25.00 = Total Tax Due $**_____

Will you store, handle or use 55 gallons, 500 pounds or 200 cubic feet of hazardous materials per year? Yes ☐ No ☐
Will you have an assembly room with an occupant load of 50 or more persons? Yes ☐ No ☐
Will you be installing a spray booth? Yes ☐ No ☐
Will your business produce dust/wood shavings or other material? Yes ☐ No ☐
Will you be storing or using flammable or combustible liquids or compressed gases? Yes ☐ No ☐
Will you be warehousing materials higher than 12 feet? Yes ☐ No ☐
Fire Department approval required for any ***"Yes"*** answer. Please make an appointment by calling (714) 327-7400.

Your Business License will be issued under the provisions of Municipal Code Section 9-1. You are cautioned that this License does not permit operation of a business in violation of other Municipal Code Sections. There will be no tax refund if you are found operating illegally after the Certificate has been issued. Your business location will be checked by Planning, Building, and, if necessary, Fire Department officials. If you have any doubt whether your business location and/or building may conform with the requirements of the Municipal Code administered by these departments, you are urged to contact these departments for further information before filing your application. ** Sales or use tax may apply to your business activities. You may seek written advice regarding the application of tax to your particular business by writing or visiting the nearest State Board of Equalization. ** I declare under penalty of perjury that, to the best of my knowledge and belief, the statements made herein are correct and true and that acceptance of payment does not constitute approval of the Business License. Authorization to conduct business is not granted until issuance of the license.

Authorized
Signature _____ *Title* _____ *Date* _____

FOR CITY OFFICE USE ONLY

Planning Approval _____ Date Approved _____ CUP Required? _____ CUP # _____

Building Approval _____ Date Approved _____ Comments _____

Fire Department Approval _____ Date Approved _____ _____

ATTACHMENT 2

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Print or type
See **Specific Instructions** on page 2.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification; check only **one** of the following seven boxes:

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____

Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Note. If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

		–							

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

Sign Here **Signature of U.S. person** ▶ **Date** ▶

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

Note. If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note. ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

Limited Liability Company (LLC). If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
Interest and dividend payments	All exempt payees except for 7
Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
Barter exchange transactions and patronage dividends	Exempt payees 1 through 4
Payments over $600 required to be reported and direct sales over $5,000[1]	Generally, exempt payees 1 through 5[2]
Payments made in settlement of payment card or third party network transactions	Exempt payees 1 through 4

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

Note. You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note. See the chart on page 4 for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note. Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

Caution: *A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.*

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account[1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor[2]
4. a. The usual revocable savings trust (grantor is also trustee) b. So-called trust account that is not a legal or valid trust under state law	The grantor-trustee[1] The actual owner[1]
5. Sole proprietorship or disregarded entity owned by an individual	The owner[3]
6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))	The grantor*
For this type of account:	**Give name and EIN of:**
7. Disregarded entity not owned by an individual	The owner
8. A valid trust, estate, or pension trust	Legal entity[4]
9. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
10. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
11. Partnership or multi-member LLC	The partnership
12. A broker or registered nominee	The broker or nominee
13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B))	The trust

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

Note. If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

Protect yourself from suspicious emails or phishing schemes. Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

PROJECT LOCATIONS MAP

LED LIGHTING INSTALLATION AT CITY PARKS AND ATHLETIC FACILITIES PROJECT, CITY PROJECT NO. 23-09
PROJECT LOCATIONS MAP

<u>LOCATIONS</u>:

1. **JACK R. HAMMETT SPORTS COMPLEX, 2750 FAIRVIEW ROAD, COSTA MESA**
2. **TeWINKLE PARK ATHLETIC COMPLEX, 970 ARLINGTON DRIVE, COSTA MESA**
3. **COSTA MESA TENNIS CENTER, 880 JUNIPERO DRIVE, COSTA MESA**
4. **BARK PARK, 890 ARLINGTON DRIVE, COSTA MESA**

EXHIBIT C

BONDS

Project and Specification No. 23-09

BIDDER'S BOND TO ACCOMPANY PROPOSAL

(Required if the bidder desires to submit bond instead of a certified or cashier's check.)

KNOW ALL PEOPLE BY THESE PRESENTS:

That we, RMF Contracting, Inc. dba R & M Electrical Contracting as principals, and Markel Insurance Company as surety, are held and firmly bound unto the City of Costa Mesa, a municipal corporation, organized under the laws of the State of California and situated in Orange County in the sum of Ten percent of amount bid ($ 10%) to be paid to the City, its successors and assigns, for which payment well and truly to be made, we bind ourselves, our heirs, executors, and administrators, successors or assigns, jointly and severally firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH,

That is the certain proposal of the above bounden, RMF Contracting, Inc. dba R & M Electrical Contracting, if accepted by the City of Costa Mesa, and if the above bounden, RMF Contracting, Inc. dba R & M Electrical Contracting, his heirs, executors, administrators, successors and assigns, shall duly enter into and execute a contract for such construction, and shall execute and deliver the CERTIFICATE OF INSURANCE and the LABOR AND MATERIAL and the FAITHFUL PERFORMANCE BONDS described within fourteen (14) days from the date of the mailing of a notice of the above bounden, RMF Contracting, Inc. dba R & M Electrical Contracting, by and from the City, that said contract is ready for execution, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

IN WITNESS WHEREOF:

We hereunto set our hands and seals this 23rd day of October, 2023.

RMF Contracting, Inc. dba R & M Electrical Contracting	Markel Insurance Company
Mary Ann Feilmeier	Adriana Valenzuela, Attorney-in-Fact
Contractor/ Principal (Notary Acknowledgement to be attached)	Surety/Power of Attorney (Notary Acknowledgment to be attached)

MF
Bidder's Initials

ATTACHMENT 2

STATE OF CALIFORNIA

DEPARTMENT OF INSURANCE **№ 07500**

SAN FRANCISCO

Amended

Certificate of Authority

THIS IS TO CERTIFY *THAT, Pursuant to the Insurance Code of the State of California,*

Markel Insurance Company

of Deerfield, Illinois *, organized under the laws of* Illinois *, subject to its Articles of Incorporation or other fundamental organizational documents, is hereby authorized to transact within the State, subject to all provisions of this Certificate, the following classes of insurance:* Fire, Marine, Surety, Disability, Plate Glass, Liability, Workers' Compensation, Common Carrier Liability, Boiler and Machinery, Burglary, Credit, Sprinkler, Team and Vehicle, Automobile, and Miscellaneous *, as such classes are now or may hereafter be defined in the Insurance Laws of the State of California.*

THIS CERTIFICATE *is expressly conditioned upon the holder hereof now and hereafter being in full compliance with all, and not in violation of any, of the applicable laws and lawful requirements made under authority of the laws of the State of California as long as such laws or requirements are in effect and applicable, and as such laws and requirements now are, or may hereafter be changed or amended.*

IN WITNESS WHEREOF, *effective as of the* 16th *day of* January, 2002, *I have hereunto set my hand and caused my official seal to be affixed this* 16th *day of* January, 2002.

Harry W. Low
Insurance Commissioner

By

Victoria S. Sidbury
Deputy

NOTICE:
Qualification with the Secretary of State must be accomplished as required by the California Corporations Code promptly after issuance of this Certificate of Authority. Failure to do so will be a violation of Insurance Code Section 701 and will be grounds for revoking this Certificate of Authority pursuant to the convenants made in the application therefor and the conditions contained herein.

FORM CB-3

OSP 00 39391

ATTACHMENT 2

POA# 510028

JOINT LIMITED POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That SureTec Insurance Company, a Corporation duly organized and existing under the laws of the State of Texas and having its principal office in the County of Harris, Texas and Markel Insurance Company (the "Company"), a corporation duly organized and existing under the laws of the state of Illinois, and having its principal administrative office in Glen Allen, Virginia, does by these presents make, constitute and appoint:

Jay P. Freeman, Cynthia J. Young, Christina Mountz, Adriana Valenzuela

Their true and lawful agent(s) and attorney(s)-in-fact, each in their separate capacity if more than one is named above, to make, execute, seal and deliver for and on their own behalf, individually as a surety or jointly, as co-sureties, and as their act and deed any and all bonds and other undertaking in suretyship provided, however, that the penal sum of any one such instrument executed hereunder shall not exceed the sum of:

Fifty Million and 00/100 Dollars ($50,000,000.00)

This Power of Attorney is granted and is signed and sealed under and by the authority of the following Resolutions adopted by the Board of Directors of SureTec Insurance Company and Markel Insurance Company:

"RESOLVED, That the President, any Senior Vice President, Vice President, Assistant Vice President, Secretary, Assistant Secretary, Treasurer or Assistant Treasurer and each of them hereby is authorized to execute powers of attorney, and such authority can be executed by use of facsimile signature, which may be attested or acknowledged by any officer or attorney, of the company, qualifying the attorney or attorneys named in the given power of attorney, to execute in behalf of, and acknowledge as the act and deed of the SureTec Insurance Company and Markel Insurance Company, as the case may be, all bond undertakings and contracts of suretyship, and to affix the corporate seal thereto."

IN WITNESS WHEREOF, Markel Insurance Company and SureTec Insurance Company have caused their official seal to be hereunto affixed and these presents to be signed by their duly authorized officers on the 24th day of January , 2023 .

SureTec Insurance Company

By: _____
Michael C. Keimig, President

Markel Insurance Company

By: _____
Lindey Jennings, Vice President

State of Texas
County of Harris:

On this 24th day of January , 2023 A. D., before me, a Notary Public of the State of Texas, in and for the County of Harris, duly commissioned and qualified, came THE ABOVE OFFICERS OF THE COMPANIES, to me personally known to be the individuals and officers described in, who executed the preceding instrument, and they acknowledged the execution of same, and being by me duly sworn, disposed and said that they are the officers of the said companies aforesaid, and that the seals affixed to the proceeding instrument are the Corporate Seals of said Companies, and the said Corporate Seals and their signatures as officers were duly affixed and subscribed to the said instrument by the authority and direction of the said companies, and that Resolutions adopted by the Board of Directors of said Companies referred to in the preceding instrument is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand, and affixed my Official Seal at the County of Harris, the day and year first above written.

JULIE E. MCCLARY
Notary Public State of Texas
Commission # 12947680-5
Commission Expires March 29, 2026

By: _____
Julie McClary, Notary Public
My commission expires 3/29/2026

We, the undersigned Officers of SureTec Insurance Company and Markel Insurance Company do herby certify that the original POWER OF ATTORNEY of which the foregoing is a full, true and correct copy is still in full force and effect and has not been revoked.

IN WITNESS WHEREOF, we have hereunto set our hands, and affixed the Seals of said Companies, on the 23rd day of October , 2023 .

SureTec Insurance Company

By: _____
M. Brent Beaty, Assistant Secretary

Markel Insurance Company

By: _____
Andrew Marquis, Assistant Secretary

Any Instrument Issued in excess of the penalty stated above is totally void and without any validity. 510028
For verification of the authority of this Power you may call (713)812-0800 on any business day between 8:30 AM and 5:00 PM CST.

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT — CIVIL CODE 1189

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached and not the truthfulness, accuracy, or validity of that document.

State of California)

County of San Bernardino)

On OCT 23 2023 before me, Vanessa Copeland, Notary Public,

personally appeared Adriana Valenzuela
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that ~~he~~/she/~~they~~ executed the same in ~~his~~/her/~~their~~ authorized capacity(~~ies~~), and that by ~~his~~/her/~~their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity upon behalf of which the person(~~s~~) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature: _____
Signature of Notary Public

VANESSA COPELAND
Notary Public - California
Orange County
Commission # 2424393
My Comm. Expires Oct 31, 2026

Place Notary Seal Above

OPTIONAL

Though the information below is not required by law, it may prove valuable to persons relying on the document and could present fraudulent and reattachment of this form to another document.

Description of Attached Document

Type or Title of Document: _____

Document Date: _____ Number of Pages: _____

Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: Adriana Valenzuela

- ☐ Individual
- ☐ Corporate Officer – Title(s): _____
- ☐ Partner: ☐ Limited ☐ General
- ☒ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer Is Representing: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____

- ☐ Individual
- ☐ Corporate Officer – Title(s): _____
- ☐ Partner: ☐ Limited ☐ General
- ☐ Attorney in Fact
- ☐ Trustee
- ☐ Guardian or Conservator
- ☐ Other: _____

Signer Is Representing: _____

ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Orange

On November 6, 2023, before me, Heather Joy Brown, notary public
(insert name and title of the officer)

personally appeared — MaryAnn Feilmeier —,
who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

HEATHER JOY BROWN
Notary Public - California
Orange County
Commission # 2356479
My Comm. Expires May 4, 2025

Signature Heather Joy Brown (Seal)

EXHIBIT D

CITY COUNCIL POLICY 100-5: DRUG-FREE WORKPLACE

CITY OF COSTA MESA, CALIFORNIA

COUNCIL POLICY

SUBJECT	POLICY NUMBER	EFFECTIVE DATE	PAGE
DRUG-FREE WORKPLACE	100-5	8-8-89	1 of 3

BACKGROUND

Under the Federal Drug-Free Workplace Act of 1988, passed as part of omnibus drug legislation enacted November 18, 1988, contractors and grantees of Federal funds must certify that they will provide drug-free workplaces. At the present time, the City of Costa Mesa, as a sub-grantee of Federal funds under a variety of programs, is required to abide by this Act. The City Council has expressed its support of the national effort to eradicate drug abuse through the creation of a Substance Abuse Committee, institution of a City-wide D.A.R.E. program in all local schools and other activities in support of a drug-free community. This policy is intended to extend that effort to contractors and grantees of the City of Costa Mesa in the elimination of dangerous drugs in the workplace.

PURPOSE

It is the purpose of this Policy to:

1. Clearly state the City of Costa Mesa's commitment to a drug-free society.

2. Set forth guidelines to ensure that public, private, and nonprofit organizations receiving funds from the City of Costa Mesa share the commitment to a drug-free workplace.

POLICY

The City Manager, under direction by the City Council, shall take the necessary steps to see that the following provisions are included in all contracts and agreements entered into by the City of Costa Mesa involving the disbursement of funds.

1. Contractor or Sub-grantee hereby certifies that it will provide a drug-free workplace by:

   A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in Contractor's and/or sub-grantee's workplace, specifically the job site or location included in this contract, and specifying the actions that will be taken against the employees for violation of such prohibition;

   B. Establishing a Drug-Free Awareness Program to inform employees about:

SUBJECT	POLICY NUMBER	EFFECTIVE DATE	PAGE
DRUG-FREE WORKPLACE	100-5	8-8-89	2 of 3

1. The dangers of drug abuse in the workplace;

2. Contractor's and/or sub-grantee's policy of maintaining a drug-free workplace;

3. Any available drug counseling, rehabilitation and employee assistance programs; and

4. The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

C. Making it a requirement that each employee to be engaged in the performance of the contract be given a copy of the statement required by subparagraph A;

D. Notifying the employee in the statement required by subparagraph 1 A that, as a condition of employment under the contract, the employee will:

1. Abide by the terms of the statement; and

2. Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;

E. Notifying the City of Costa Mesa within ten (10) days after receiving notice under subparagraph 1 D 2 from an employee or otherwise receiving the actual notice of such conviction;

F. Taking one of the following actions within thirty (30) days of receiving notice under subparagraph 1 D 2 with respect to an employee who is so convicted:

1. Taking appropriate personnel action against such an employee, up to and including termination; or

2. Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health agency, law enforcement, or other appropriate agency;

G. Making a good faith effort to maintain a drug-free workplace through implementation of subparagraphs 1 A through 1 F, inclusive.

2. Contractor and/or sub-grantee shall be deemed to be in violation of this Policy if the City of Costa Mesa determines that:

   a. Contractor and/or sub-grantee has made a false certification under paragraph 1 above;

   b. Contractor and/or sub-grantee has violated the certification by failing to carry out the requirements of subparagraphs 1 A through 1 G above;

   c. Such number of employees of Contractor and/or sub-grantee have been convicted of violations of criminal drug statutes for violations occurring in the workplace as to indicate that the contractor and/or sub-grantee has failed to make a good faith effort to provide a drug-free workplace.

3. Should any contractor and/or sub-grantee be deemed to be in violation of this Policy pursuant to the provisions of 2 A, B, and C, a suspension, termination or debarment proceeding subject to applicable Federal, State, and local laws shall be conducted. Upon issuance of any final decision under this section requiring debarment of a contractor and/or sub-grantee, the contractor and/or sub-grantee shall be ineligible for award of any contract, agreement or grant from the City of Costa Mesa for a period specified in the decision, not to exceed five (5) years. Upon issuance of any final decision recommending against debarment of the contractor and/or sub-grantee, the contractor and/or sub-grantee shall be eligible for compensation as provided by law.