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. <u>CITY'S REPRESENTATIVE</u>.

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

4. CONTRACTOR'S PROJECT MANAGER; PERSONNEL.

- (a) <u>Project Manager</u>. CONTRACTOR's Project Manager must be approved by CITY. Such approval shall be at CITY's sole discretion.
- (b) <u>Personnel</u>. 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) <u>Termination for Breach of Contract</u>.

- (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. <u>PERFORMANCE BY SURETIES</u>.

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. <u>INSPECTION BY CITY</u>.

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) <u>Minimum Scope and Limits of Insurance</u>. 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) <u>Endorsements</u>. 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) <u>Reporting Provisions</u>. 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) <u>Insurance Applies Separately</u>. 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) <u>Deductible or Self-Insured Retention</u>. 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) <u>Proof of Insurance</u>. 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) <u>Non-Limiting</u>. 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) <u>Legal Working Day</u>. 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) <u>Apprentices</u>. 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) <u>Payroll Records</u>. 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) <u>Registration with California Department of Industrial Relations ("DIR")</u>. 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.

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. <u>NON-DISCRIMINATION</u>.

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.

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.

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		

Date:	
Date:	
Date:	
	Date:

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	PROP	OSAL		
ITEM #	BID ITEM DECRIPTION	QTY.	UNIT	UNIT PRICE (in figures)	ITEMS TOTAL (in figures)
LED	LIGHTING INSTALLATION AT CITY PARK	S AND	ATHLE	TIC FACILIT	IES:
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	RID	PROPOSAL	FIGU	JRES:

\$ 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 <u>City reserves the right to delete one or more bid items and/or to increase and/or to decrease bid items' quantities.</u>

The CITY also reserves the right to reject all Bids.

PROPOSAL BID SCHEDULE (CONTINUED)

NOTES:

- 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*.

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
/s /59,700.0))
Contractor's Lawful Name: RMF Contracti	in figures ng Inc. dba R&M Electrical Contracting
Bidder's Name: MaryAnn Feilmeier	Bidder's Initials:
Contractor's License No. 813655	Expiration: 10/31/2024
Contractor's Taxpayer I.D. Number:33-0	990428
Contractor's DIR Registration Number: 10	00003540
Signature:	Date:
Contractor's Address: 1523 N Harmony Ci	ircle, Anahelm, CA 92807
Telephone Number: (949) 770-2269	Mobile No.: <u>(949</u>)230-1279
Fax Number: (949) 770-4221	E-mail: heather@r-melectrical.com
24-Hour Emergency Contacts:	
Richard Feilmeier	Telephone Number: (949) 770-2269
Name	Mobile No.: (949) 230-1279
Timothy Hess	Telephone No.: (949) 770-2269
Name	Mobile No.: (949) 230-2179
Heather Brown	Telephone No.: (949) 770-2269
Name	Mobile No.: (949) 374-0972

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 ofTen 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.

Respectfully Submitted,

KIVIF CC	ormacing inc. and roam	A Electrical Contracting	Richard Fellmeier	7 Tooldon
	Contractor's Bu	siness Name	Contractor	Title Secretary
	1523 N. Harmon		1 mm	
	Business Add Anaheim CA		∜Singed By 813655 C-10, A	Tille 10/31/2024
	City Sta 949-770-2269	77	Contractor's License No. and C 11/13/2	
Mary	Business Pho Ann Feilmeier	ne Number Secretary	Date 21321 Bis	
Missio	Name n Viejo CA	Title 92692	Residence: 949-770	
City	State	Zip	Residence phor	ne Number
of the co	d is by a corporat orporation and w orporation	ion, state the names o hether more than one	of the officers who can sign an age officer must sign. Taxpayer I.D. Number:	
Iomo F	Richard Feilmeier -	- President	Can Sign	Must Sign □
lame N	MaryAnn Feilemei	er - Secretary		Ħ
				ā
arrio				_
	rtnership or Joint	t Ventures	Taxpayer I.D. Number: _	
	SS		1	
		11.60		
		1.1		
the bid s	dder is a sole pro shall be in the re name)": provide	prietorship or anothe	er entity that does business unde er with a designation following s ious name shall be used unless	showing "DBA (the
	names and resid ls, are as follows		and parties interested in the fore	egoing proposal, as
IOTE:	Give first and Secretary, Trea joint ventures, g	last names in full; i surer and Manager, a give names of all the	n case of corporation, give na and affix corporate seal; in case individual members.	mes of President, of partnerships and
		n	/a	
			./ U	
_				M
				Bidder's Initials

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

Addendum No.	Date Received	<u>Bidder's Signature</u>
	11/7/2023	Infu file
2	11/8/2023	Mp July

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
7/6/2023	City of Whittier Murphy Ranch Little League BB Field Lighting	Information 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 714-895-834
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		Modesto Balanos PH 310- 847-3519
4/1/2022	Golden West College District Golden West College Pool	Danny Johnson PH 714-895-8344

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 Sub	S		

By submission of this proposal, the Bidder certifies:

- 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.

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.

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 I 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

Subscribed and sworn to before me by:

This

day of

, 20

My Commission Expires:

Notary Public

certificate verifies only who signed the document	r officer completing this the identity of the individual ent to which this certificate e truthfulness, accuracy, or nt.
State of California County of	je .
Subscribed and sworn day of November	to (or affirmed) before me on this 15th, 2025, by Manyann Fulmeter
proved to me on the ba person(s) who appeare	sis of satisfactory evidence to be the d before me.
HEATHER JOY BRO Notary Public - Calif Orange County Commission # 2356 My Comm. Expires May 4	fornia (479
(Seal)	Signature

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 Many Ann Feil meier RMF Contracting Inc. dba R&M Electrical Contracting
		Company Name

PROJECT:

11/13/2023

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

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/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
		10/0		
		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	laryAma Feilmeier
Bidder/Applicant/Proposer	RMF Contracting Inc. dba R&M Electrical Contracting
11/13/2023	
Date	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: Ton Thins

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 <u>original</u> 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 <code>janet.zuazo@costamesaca.gov</code>. A COPY WILL NOT BE SENT BY MAIL.

Company: PMF CONTRACTIVE, 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. <u>BID SUBMISSION AND OPENING</u>: 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.

 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. <u>BID CONTENTS</u>: 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. <u>BID SECURITY</u>: Each bidder must submit an <u>original</u> 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. <u>NO electronic bid securities through e-mail or other electronic means will be accepted.</u>
- 6. CONTRACTOR'S LICENSE: A valid <u>California Contractor's License Class "A" (General Engineering Contractor)</u> 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.

ATTACHMENT 2

- 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. <u>ADDITIONAL REQUIREMENTS</u>: 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



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



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 TTACHMENT 2

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 with Ectly of Costs Mess'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 tids 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/portalcfm? CompanyID=45476.

 SCOPE OF WORK AND BID DOCUMENT'S: 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.
- 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 the 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 see, 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 (DRI 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.
- 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, marrial status, sex, gender, gender expression, gender identity, sexual orientation, age, or military or veteran status in its solicitation, selection, hining, or treatment of individuals or businesses in connection with the bidding process or work performed for the City in connection with the project.
- 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.

anet. 20a20 @costamesaca.gov. A COPT 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

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

DAILY basis through the close of bids for any applicable addenda or updates.

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 <u>original</u> 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,

Seung Yang, P.E. City Engineer

S. Yang

SY: Attachments

Jack Hammett Sports Complex Costa Mesa, CA

Lighting System

Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circui
A1	80'	80'	3	TLC-LED-1500	4.23 kW	A
A2	80,	80"	2	TLC-LED-1500	2.82 kW	A
rie.		80'	2	TLC-LED-900	1.76 kW	A
A3	80'	80"	2	TLC-LED-1500	2.82 kW	В
		80"	2	TLC-LED-900	1.76 kW	В
A5	80'	80'	3	TLC-LED-1500	4.23 kW	В
B1	80'	80"	4	TLC-LED-1500	5.64 kW	A
B2	80'	80"	4	TLC-LED-1500	5.64 kW	В
CI	80'	80'	3	TLC-LED-1500	4.23 kW	В
- Ca		80"	3	TLC-LED-1500	4.23 kW	A
C2	80'	80"	2	TLC-LED-1500	2.82 kW	Α.
		80'	2	TLC-LED-1500	2.82 kW	В
		80'	2	TLC-LED-900	1.76 kW	A
		80'	2	TLC-LED-900	1.76 kW	В
D1	80'	80"	4	TLC-LED-1500	5.64 kW	В
		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	С
52	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	2.34kW	E
		80"	2	TLC-LED-1200	2.34 kW	C
		80"	2	TLC-LED-900	1.76 k₩	C
		80"	2	TLC-LED-900	1.76 kW	E
54	80'	80"	2	TLC-LED-1200	2.34 kW	D
		80"	2	TLC-LED-1200	2.34 k₩	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
56	80'	80'	2	TLC-LED-900	1.76 kW	F
		80"	2	TLC-LED-1200	2.34 kW	F
57	60,	60°	4	TLC-LED-900	3.52 kW	G
S10			4			G
S8	60'	60"	4	TLC-LED-900	3.52 kW	Н
		60°	4	TLC-LED-900	3.52 kW	G
S9	60'	60°	4	TLC-LED-900	3.52 kW	Н
S11	70'	70"	4	TLC-LED-900	3.52 kW	Н
		70°	4	TLC-LED-900	3.52 kW	G
S12	70'	70"	4	TLC-LED-900	3.52 kW	Н

Circuit Sumn	nary		
Circuit	Description	Load	Fixture Qty
A	Soccer 1	28.90 kW	22
В	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
Н	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 Line Amperage Per Luminaire										
(.90 min power factor) (max draw)										
Single Phase Voltage	208	220	240	277	347	380	480			
suigie riiase voitage	(60)	(60)	(60)	(60)	(60)	(60)	(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										

Light Level Summary

Calculation Grid Summary										
Grid Name	Calculation Metric		- 1	Circuits	Fixture Qtv					
Grid Name	Calculation Webit	Ave	Min	Max	Max/Min	Ave/Min	Circuits	Fixture Qty		
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	В	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	Н	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		

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Jack Hammett Sports Complex

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

Guaranteed Average 30 Scan Average 32.81 Maximum 42

Applied Circuits A

Total Load 28.90 kW

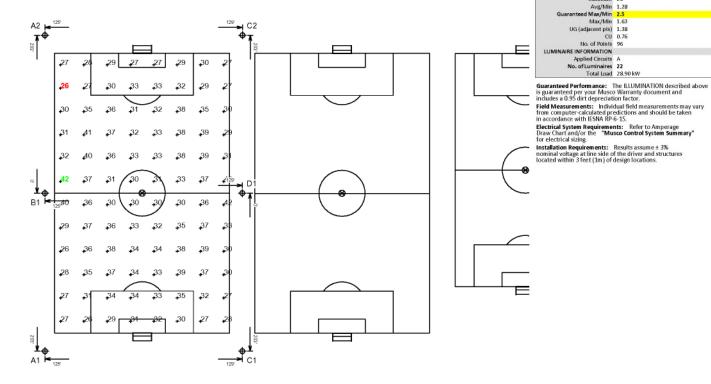
Minimum 26 Avg/Min 1.28 Guaranteed Max/Min 2.5 Max/Min 1.63 UG (adjacent pts) 1.38 No. of Points 96

Entire Grid

Costa Mesa, CA Grid Summary

Equipment List For Areas Shown										
	Pole Luminaires									
QTY	LOCATION	SIZE	GNADE 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



SCALE IN FEET 1:80

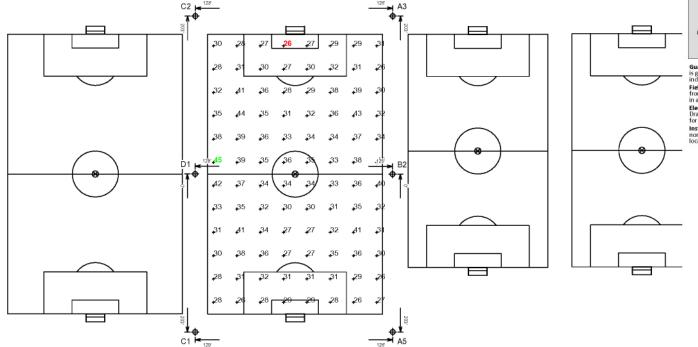
Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠



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Equipment List For Areas Shown										
	Pole Luminaires									
QTY	LOCATION	SIZE	GNADE 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						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 3.0 0' x 30.0''
Height 3.0' above grade

Illumination Summa	гу	The second secon
		MAINTAINED HORIZONTAL FOOT CANDLES
	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	В	
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.



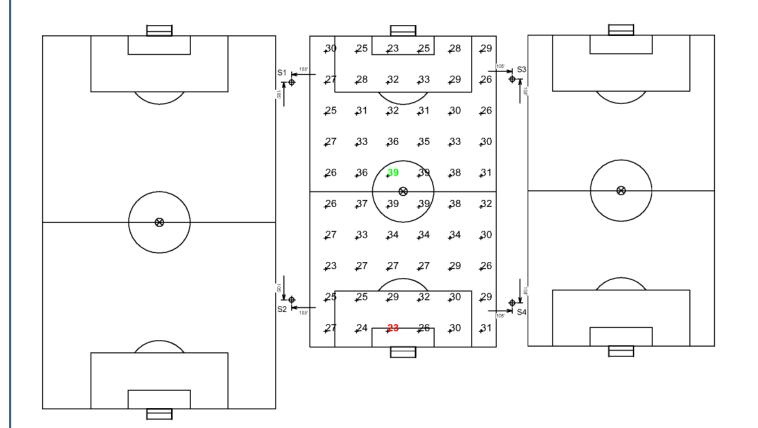
Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠



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Equ	Equipment List For Areas Shown										
	Pole Luminaires										
QTY	LOCATION	SIZE	GNADE 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	53-54	80'	-	80'	TLC-LED-1200	2/2*	2	2			
				80'	TLC-LED-900	2/2*	2	2			
4				Totals		24	16	8			

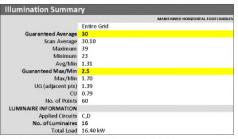
^{*}This structure utilizes a back-to-back mounting configuration



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



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.

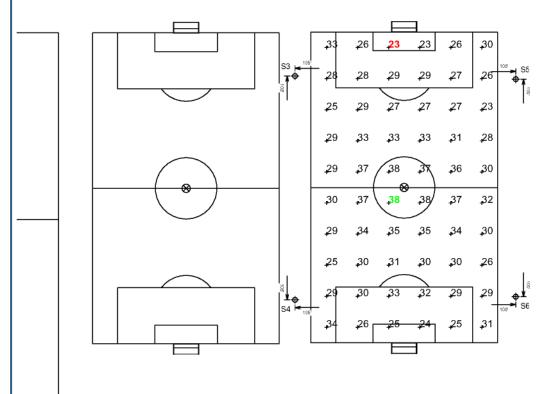


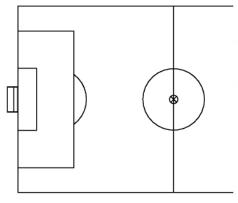
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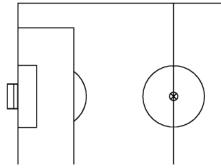
Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠

Equipment List For Areas Shown Luminaires LOCATION LUMINAIRE TYPE QTY/POLE SIZE 80' TLC-LED-1200 S3-S4 TLC-LED-900 80' TLC-LED-1200 800 TLC-LED-900 24 16 8 4 Totals

^{*}This structure utilizes a back-to-back mounting configuration







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

Jack Hammett Sports Complex Costa Mesa, CA

| Size 300' x 180' | Spacing 30,0' x 30.0' | Height 3.0' above grade

Illumination Summa	ry	
		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.

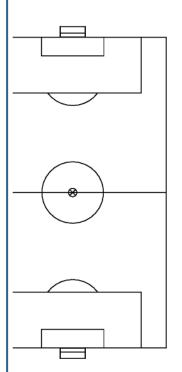
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

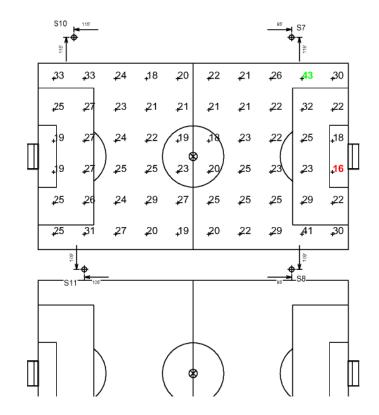


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Equ	Equipment List For Areas Shown										
	Pole Luminaires										
QTY	LOCATION	SIZE	GNADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS			
2	57 510	60'	-	60'	TLC-LED-900	4	4	0			
1	58	60'	-	60"	TLC-LED-900	4/4*	4	4			
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







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

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.

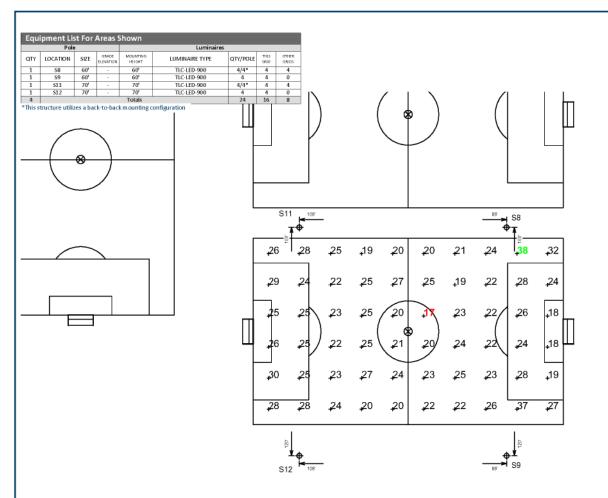
Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

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



Jack Hammett Sports Complex Costa Mesa, CA

Grid Summary

Name Soccer 6
Size 300' x 180'
Spacing 30 v x 30.0'
Height 3.0' above grade

Illumination Summa	гу	
		MAINTAINED HORIZONTAL FOOT CANDLES
	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	Н	
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.

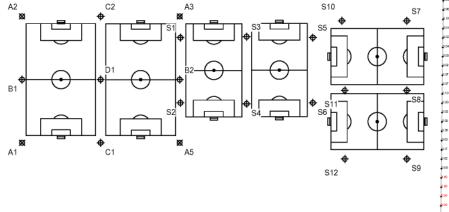
Pole location(s) ⊕ dimensions are relative to 0,0 reference point(s) ⊠



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Equ	ipment Lis	st For	Areas S	Shown				
	Pole	0			Luminaires			
QTY	LOCATION	SIZE	GNADE 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	57 59-510	60'	-	60'	TLC-LED-900	4	4	0
1	58	60'	-	60'	TLC-LED-900	4/4*	8	0
1	S11	70'	-	70"	TLC-LED-900	4/4*	8	0
1	512	70'	-	70"	TLC-LED-900	4	4	0
21				Totals		108	108	0
*This s	tructure utili:	zes a bac	k-to-bac	k mounting o	onfiguration			

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



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 Summa	гу	
		MAINTAINED HORIZONTAL FOOT CANDLES
	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.

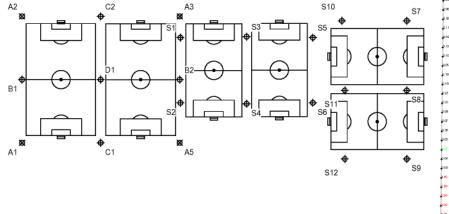
in accordance with IESTA RPG-15.
Electrical System Requirements: Refer to Amperage
Draw Chart and/or the "Musco Control System Summary"
for electrical Sizing.
Installation Requirements: Results assume ± 3%
nominal voltage at line side of the driver and structures
located within 3 feet (Im) of design locations.



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Equ	ipment Lis	st For	Areas S	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	57 59-510	60'	-	60'	TLC-LED-900	4	4	0
1	58	60'	-	60"	TLC-LED-900	4/4*	8	0
1	S11	70'	-	70"	TLC-LED-900	4/4*	8	0
1	512	70'	-	70"	TLC-LED-900	4	4	0
21				Totals		108	108	0
*This s	tructure utili:	res a bar	k-to-back	k mounting o	onfiguration			

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



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

Jack Hammett Sports Complex Costa Mesa, CA

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

Illumination Summary							
		MAINTAINED MAX VERTICAL FOOT CANDLES					
	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						

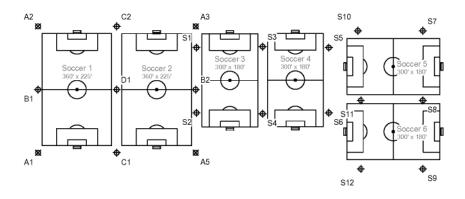
Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESMA RF6-15.

in accordance with IESTA RPG-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 (Im) of design locations.



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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.

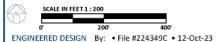
Equ	ipment Lis	t For Ar	reas Show	n	Total Control	
		Pole			Luminaires	
QTY	LOCATION	SIZE	DNADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLI
2	A1 A5	80"	+	80'	TLC-LED-1500	3
2	A2-A3	80,		80,	TLC-LED-1500	2
				80'	TLC-LED-900	2
2	B1-B2	80"	+	80'	TLC-LED-1500	4
1	C1	80"	+	80'	TLC-LED-1500	6
1	C2	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	58	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

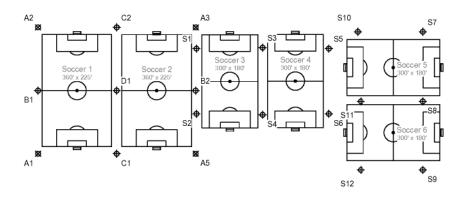
*This structure utilizes a back-to-back mounting configuration

Driver Specifications (.90 min power factor)		Lin		rage Per nax dra	r Lumin w)	aire	
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



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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.

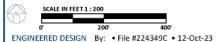
Equ	ipment Lis	t For Ar	eas Show	n		
		Pole			Luminaires	
QTY	LOCATION	SIZE	DRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE
2	A1 A5	80"	+	80'	TLC-LED-1500	3
2	A2-A3	80,		80,	TLC-LED-1500	2
				80'	TLC-LED-900	2
2	B1-B2	80"	+	80'	TLC-LED-1500	4
1	C1	80"	+	80'	TLC-LED-1500	6
1	C2	80"	+	80'	TLC-LED-1500	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	53-54	80"	-	80'	TLC-LED-1200	2/2*
				80,	TLC-LED-900	2/2*
3	S7 S9-S10	60"		60'	TLC-LED-900	4
1	58	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

Driver Specifications (.90 min power factor)		Lin	e Ampei (n	rage Pe nax dra		aire	
Single Phase Voltage	208	220 (60)	240 (60)	277 (60)	347	380 (60)	486
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



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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: Control System Type:

Control-Link Control and Monitoring

480/60/

Project Notes:

Communication Type:

PowerLine-ST

Power Requirements

Control cabinet(s):

Control voltage (phase to neutral) VA loading - Inrush VA loading - Sealed

Lighting Circuits:

Voltage/Hertz/Phase

	Equipment l	isting	
120/60	Description	Qty	Size (in)
	Control and monitoring cabinet - primary	1	24 X 72
80/60/3	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.



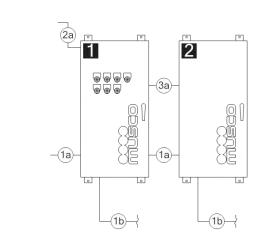
Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349 Control System ID: 1 of 1

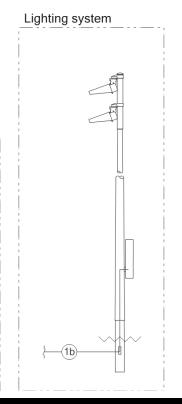
Distribution Panel Location/ID: Soccer

Equipment Layout and Connection Details



Control cabinet location





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	_	71	vII	-4-	44511	Р.

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

- Control and monitoring cabinet primary
- 2 Control and monitoring cabinet secondary

Sales Representative: Karin Anderson | Project Engineer: Daniel Lohman | Scan: 224349C | Document ID: 224349P1V2C2-1012164026

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					

Sales Representative: Karin Anderson | Project Engineer: Daniel Lohman | Scan: 224349C | Document ID: 224349P1V2C2-1012164026



Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349 Control System ID: 1 of 1

Distribution Panel Location/ID: Soccer

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			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)

Bid Addendum No. 2 ATTACHMENT 2

Project and Specifications / Bid Contract Documents No. 23-09

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:

STRUCTURAL ENGINEERS

JOSH RANDALL, SE No. 4506 9931 Muirlands Blvd

Irvine, CA 92618

MUSCO LIGHTING, INC. Light Structure Pole and Foundation Standard

Calculation Index

CONTENTS:

<u>Page</u>	<u>ltem</u>	
1-2 3-4	LSS50-A (w/ 2 Fixtures) LSS50-A (w/ 2 Fixtures)	-Wind Analysis -Seismic Analysis
5-9	Precast Base by Rinker	-Seisifile Affaiysis
10-11	LSS50-AB (w/ 8 Fixtures)	-Wind Analysis
12-13	LSS50-AB (w/ 8 Fixtures)	-Seismic Analysis
14-18	Precast Base by Rinker	-
19	Foundation Check	
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

#REF!

D/t < .11E/Fy =

58

Slender element Section for Uniform Compression

LS50-A Wind

ATTACHMENT 2 POLE DESIGNATION: LS50-A W/ FIXTURES JOB NO: 463.358 STRUCTURAL Tewinkle Park Tennis MANUFACTURER: MUSCO PROJECT: PROJECT NO: 215837 LOCATION: Costa Mesa, CA ASCE 7-16 T1, T4, T8, T9, T11, T14 POLE ID: WIND CRITERIA 95 MPH,EXP C | P = SUPERIMPOSED WT + POLE WT LOAD COMB 1.2 DEAD + 1.0 WIND <--FIXTURES, F/Af= qz*Gf*Cf = 30.97 PSF MAX ^ |||a <--(29.4-1)LED **550** <--where qz=.00256*Kz*Kzt*Kd*Ke(V)2 = 25.36 PSF MAX (26.10-1) | |v| <--<--EPA/FIXTURE*, Af 1.70 ft2 1 111 WEIGHT,P D.L./FIXTURE** 50.5 lbs | |v| <--ATTACHMENT NUMBER DIST. FROM PA Cf EPA Κz qz WIND,F D.L. ECE/FIXTURE*** SQ FT LBS 10.0 lbs 1 111 TYPE TOP POLE,FT SQ FT PSF LBS LED550 1 095 * EPA = EFFECTIVE PROJECTED AREA OF LIGHT FIXTURE | |v| 2.0 0.5 1.0 1.70 25.31 105 101 INCLUDING CROSSARM, PER MUSCO <--0.0 3.0 1.3 1.70 1 084 25.04 ** D.L.= DEAD LOAD OF FIXTURE, & 0.0 5.5 1.3 1.70 1.072 24.76 CROSSARM, PER MUSCO <--0.0 8.0 1.3 1 70 1 059 24 47 ***D.L.= DEAD LOAD OF ECE, <--0.0 10.5 1.3 1 70 1 046 24.16 PER MUSCO <--0.0 13.0 1.3 1.70 1.032 23.83 0.0 15.5 1.3 1.70 1.017 23.49 <--0.0 18.0 1.3 1.70 1 001 23.13 <--0.0 20.5 1.3 1.70 0.985 22.75 <--0.0 23.0 1.3 1 70 0.967 4.00 ECE 39.2 19.61 125 <--2.0 1.3 5.20 0.849 20 TOTALS = 230 121 v | |b 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 50.87 ft. (ht. from adj. grade) -> I = -> | = 50.87 ft. (ht. from grade) ->tA = 0.12 in. (pole thk. @ top) in. (pole diam. @ top) = Ab<-4 75 ->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 = (Table 26.6-1) 1 -> Kz = 1.098 MAX-EXP C @ 50.9 (Table 26.10-1) (Table 26.9-1) 1.00 ->Ke = -> Cf = 1.00 LIGHT FIXTURE (INCLUDED IN EPA) 1.200 MAX (VARIES 0.5-1.2 FOR RND POLE) -> Cf = (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 Section 26.11.5 Gust-Effect Factor (Reference Vibration Problems in Engineering by Timoshenko, 4th ED. pg.34) -> Gf= 1.22 (Section 26.11.5) constant epsilon,e = 0.2 Lz 492.3 Pole Properties: 500 N1 3.259 4.68 in4 taper = 0.140 in/ft Vz = 89.49 Rn 0.066 la = 4.6n1h/Vz lb= 38 in4 db/da = 1.987 = 1.549 4.6n1B/Vz = 0.018 R 1.072 1.638 3.295 ra = in rb = 1.745 in2 Ab = 3.51 in2 15.4n1L/Vz 0.060 gR 4.063 Aa = Sa = 1.97 in3 Sh = 8.08 in3 0.200 Rh Ιz 0.203 From Critical Buckling Loads of Tapered Columns, ASCE 2/62: = 0 447 = Log (lb/(la)/Log (dB/dA) = 3.06 RB 0.988 Q 0.932 = P* = RI $(lb/la)/(lb/la)^{333} =$ 4 1 0.961 0.891 G kl/req^* (1/(P*)^.5)[kl/ra] = 389 (where k= 2.1) Gf = 1.221 AISC 360-16 Specification Table B4.1, Case 15 for Fy = 55.0 38 KSI 343 D/t < .45E/Fy =237 (MAX) SHEAR.F= 0.540 KIPS 28.30 FT AXIAL,P = 0.560 KIPS ASD Forces at groundline (for foundation design) MOMENT, M = 15.29 K-FT e= M/F = D/t < .31E/Fy = 163 237 Noncompact SHEAR,F= 0.900 KIPS MOMENT, M = 25.48 e= M/F = 28.30 FT AXIAL,P = 0.672 KIPS Nominal Forces at groundline D/t < .07E/Fy = 37 53 Compact M < ΦMn = 42 K-FT Precast Base O.K.

Pole Stress Check = 0.660

Max. Deflection = 45.676 Inch

Max. < 1 Pole O.K.

<0.10H=

61 Inch

AASHTO 10.4.2

stance	Outside							E3-4	E3-2 or E3-3		F8.1-F8.4			H1-1b	H1-1a	2nd Order			1st Order	C2.2a	A Total A	(E? 44 N	MENT	2	
m top	Diameter	Pole				Cf		İ	Design comp	Acting	Design flex.	Req'd flex.		for	for	/1st Order		Req'd shear	Delta	P-Delta	2nd Order	O	ACTING	-	DEFL
Pole	of Pole,D	thick,t	D/t	Kz	qz	Pole	kl/r	Fe	strength, Pn	unfactored, Pr		strength, Mr	Pr/Pc	Pr/Pc <0.2	Pr/Pc ≥ 0.2	Moment	CSR	strength,, F		Moment	Moment	Q	MOM DUE	M/I	DUE TO
FT	IN	IN			PSF		eqiv.		KIPS	KIPS	K-FT	K-FT				FT-K	O.K.	KIPS	IN	FT-K	FT-K		TO DL		IN
																									ı
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	27.8
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	Υ	0.120	44.1	0.0	0.1	1.3993	0.00	0.0124	26.8
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	Υ	0.134	42.5	0.0	0.2	1.3993	0.11	0.0365	25.9
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	Υ	0.149	41.0	0.1	0.4	1.3993	0.23	0.0619	24.9
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	Υ	0.163	39.4	0.1	0.6	1.3993	0.35	0.0885	23.
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	Υ	0.178	37.9	0.1	0.7	1.3993	0.48	0.1165	22.
6	4.75	0.120	39.6	1.069	24.70	1.2	389	1.89	2.61	0.137	7.89	8.0	0.063	0.152	N.A.	1.136	Υ	0.192	36.3	0.1	1.0	1.3993	0.61	0.1457	22.
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	Υ	0.206	34.8	0.1	1.2	1.3993	0.75	0.1761	21.
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	Υ	0.220	33.2	0.2	1.4	1.3993	0.90	0.2079	20.
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	Υ	0.235	31.7	0.2	1.7	1.3993	1.05	0.2409	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	Υ	0.249	30.3	0.2	1.9	1.3993	1.21	0.2751	18.:
1	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	Υ	0.263	28.8	0.2	2.2	1.3993	1.37	0.3107	17.
2	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	Υ	0.277	27.3	0.3	2.5	1.3993	1.54	0.3475	16.
3	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	Υ	0.290	25.9	0.3	2.8	1.3993	1.71	0.3855	15.
4	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	Υ	0.304	24.6	0.3	3.1	1.3993	1.90	0.4124	14.
5	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	Υ	0.318	23.2	0.3	3.5	1.1634	2.08	0.4202	13.
6	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	Υ	0.332	21.9	0.4	3.8	1.1495	2.28	0.4203	13
7	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	Υ	0.346	20.6	0.4	4.2	1.1363	2.48	0.4196	12
8	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	Υ	0.361	19.4	0.4	4.6	1.1238	2.68	0.4182	11
9	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.
0	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
1	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.
2	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.
3	5.96	0.120	49.7	0.967	22.34	1.2	389	1.89	3.29	0.247	15.90	6.2	0.009	0.466	N.A.	1.087	Ϋ́	0.423	13.8	0.5	6.7	1.0701	3.82	0.4057	8.3
4	6.1	0.120	50.8	0.960	22.17	1.2	389	1.89	3.37	0.255	16.60	6.6	0.090	0.477	N.A.	1.085	Ϋ́	0.455	12.8	0.6	7.2	1.0608	4.07	0.4025	7.6
5	6.24	0.120	52.0	0.952	22.17	1.2	389	1.89	3.45	0.263	17.33	7.1	0.091	0.477	N.A.	1.083	Y	0.433	11.9	0.6	7.7	1 1	4.33	0.3994	7.0
- 1				1			389		1		18.07	7.1			1		Ϋ́				1	1.052			
6	6.38	0.120	53.2	0.944	21.82	1.2		1.89	3.52	0.271	1		0.092	0.497	N.A.	1.081		0.488	11.0	0.6	8.2	1.0435	4.60	0.3961	6.
7	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	6.0
8	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.
9	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	5.0
0	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	Υ	0.529	7.7	0.7	10.3	1.0131	5.75	0.383	4.
1	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	Υ	0.539	6.9	0.7	10.8	1.0063	6.06	0.3798	4.
2	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	Υ	0.550	6.2	0.8	11.4	0.9997	6.38	0.3766	3.
3	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	Υ	0.560	5.6	0.8	12.0	0.9933	6.71	0.3735	3.
1	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	Υ	0.571	5.0	0.8	12.6	0.9872	7.05	0.3705	2.
5	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	Υ	0.582	4.4	0.8	13.2	0.9814	7.40	0.3675	2.
3	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	Υ	0.592	3.9	0.8	13.8	0.9757	7.75	0.3645	2.
7	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	Υ	0.603	3.4	0.9	14.4	0.9702	8.12	0.3616	2.
3	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	Υ	0.614	2.9	0.9	15.0	0.965	8.50	0.3588	1.
9	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	Υ	0.626	2.5	0.9	15.7	0.9599	8.89	0.3561	1.
)	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	Υ	0.762	2.1	0.9	16.4	0.955	9.29	0.3538	1.
1	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	Υ	0.774	1.7	0.9	17.1	0.9502	9.72	0.3519	1.
2	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	Υ	0.786	1.4	0.9	17.9	0.9456	10.16	0.35	0.
3	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	Υ	0.798	1.1	1.0	18.7	0.9411	10.61	0.3481	0.
1	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	Υ	0.810	0.8	1.0	19.6	0.9368	11.07	0.3462	0.
5	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	Υ	0.823	0.6	1.0	20.4	0.9326	11.55	0.3443	0.
3	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	Υ	0.835	0.4	1.0	21.2	0.9286	12.04	0.3425	0.
,	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.
3	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.
9	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	0.0
0	9.74	0.120	81.2	0.849	19.61	0.7	389	1.89	5.42	0.542	40.39	23.7	0.119	0.672	N.A.	1.044	NA	0.875	0.0	1.0	24.7	0.9171	14.10	0.3353	0.0
١ -	9.88	0.120	82.3	0.849	19.61	0.7	389	1.89	5.49	0.563	41.51	24.6	0.120	0.672	N.A.	1.042	NA	0.888	0.0	1.0	25.6	0.9133	14.65	0.0000	0.0

KNA STRUCTURAL ENGINEERS

Reference:	2022 CE	BC, AS	CE 7-16
INPUT: Job Location:	Costa Me	esa, CA	
Site Class	D-Defaul	t	ASCE
0.2 Sec MCE, Ss	1.312	g	ASCE
1.0 Sec MCE, S ₁	0.469	g	ASCE
Site Coeff., Fa	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
$S_{DS} = 2/3S_{MS}$	1.050	g	ASCE
S _{D1} = 2/3S _{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 \leq 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 = 0.044S _{DS} I ≥ 0.03	0.046	g	ASCE 7-16 Eqn. 15.4-1
if $S_1 \ge 0.6g$, $C_S \min = 0.8S_1/(R/I)$	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 = $0.2S_{DS}D$ Load Combination, $1.2D + (pQe + 0.2S_{DS}D)$	0.210	D	ASCE 7-16 Eqn. 12.4-4
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	O.900 kips WIND SHEAR WIND CONTROL

Vertical Distribution of Seismic Force, F_{x=} C_{vx}V ASCE7-16 Eqn. 12.8-11 & Section 12.8.5 k= 1.594

k=	1.594
----	-------

Item	w	h _x	$w_x h_x^k$	w _x h _x ^k /∑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 design: Musco Pole Design 1B



Pole Calcuations - Page 1

ACI 318-14

Inputs

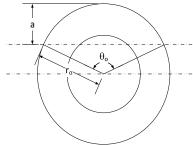
Pole Type	1B		$f_{py} =$	230.0 ksi	Strand Yield Strength
D _o =	9.48 in	Outer Diameter	$f_{pu} =$	270.0 ksi	Strand Ultimate Strength
D _i =	4.25 in	Inner Diameter	f' _c =	9.5 ksi	28 Day Strength of Concrete
$D_{tc} =$	6.625 in	Diameter of Tendon Circle	$E_s =$	29000.0 ksi	Elastic Modulus of Strand
$d_t =$	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 in ²	Area of Single Strand	a =	2.73 in	
Φ=	0.90	Resistance Factor	c =	4.19 in	
ß ₁ =	0.65	$f_{c} \ge 8 \text{ ksi}$			

Determine Concrete Compression Forces (Bending Only)

Calculate the Properties of the Compression Zone

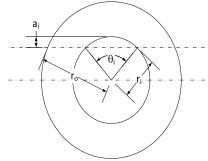
A. Calculate the Section Properties based on Outer Radius (Note: These Calculations Assume there is no core in the pole)

$$\begin{split} c_o &= D_o/3 = & 3.16 \text{ in} \quad \text{Initial Guess} \\ r_o &= D_o/2 = & 4.74 \text{ in} \\ \Theta_o &= 2 * \cos^{-1}((r_o - a)/r_o) = & 2.26 \\ I_o &= r_o^{-4}/8 * \Theta_o.\sin(\Theta_o) + (2*\sin(\Theta_o)*\sin(\Theta_o/2)^2) = & 173.8 \text{ in}^4 \\ A_o &= (r_o^{-2}*\cos^{-1}*(r_o - a)/r_o) - ((r_o - a)*V((2*r_o * a) - a^2) = & 16.78 \text{ in}^2 \\ y_{ro} &= (4*r_o*\sin(\Theta_o/2)^3)/(3*(\Theta_o-\sin(\Theta_o))) = & 3.14 \text{ in} \end{split}$$



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

$$\begin{split} r_i &= D_i/2 = & 2.13 \text{ in} \\ a_i &= & 0.11 \text{ in} \\ \Theta_i &= 2 * \cos^{-1}((r_i - a_i)/r_i) = & 0.65 \\ I_i &= r_i^4/8 * \Theta_{i\cdot} \sin(\Theta_i) + (2*\sin(\Theta_i)*\sin(\Theta_i/2)^2) = & 0.4 \text{ in}^4 \\ A_i &= (r_i^{2*} \cos^{-1*}(r_i - a)/r_i) - ((r_i - a)* \vee ((2*r_i * a) - a^2) = & 0.1 \text{ in}^2 \\ y_{ri} &= (4*r_i * \sin(\Theta_i/2)^3)/(3*(\Theta_i - \sin(\Theta_i))) = & 2.06 \text{ in} \end{split}$$



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 in ²	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
$A' = \pi^*(r_0^2 - r_i^2) - A_c =$	39.7 in ²	Area of the Tension Zone with the Strand Included



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.

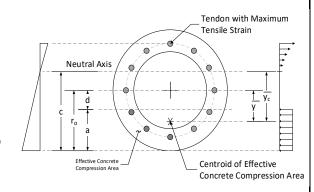
$$A_{pscomp} = N_c * A_{ps} = 0.22 in^2$$

Effective Area of Concrete in Compression

$$A_e = A_c - A_{pscomp} = 16.47 \text{ in}^2$$

C. Compute the Compression Force

$$F_c = A_e * 0.85 * f'_c = 133.0 \text{ kip}$$



Determine Steel Tensile Forces

Calculate the Total Prestressing Force.

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

Converge the Forces to Achieve a Balance Condition

$$c = 4.19 in$$

$$F_c - F_t = 0 \text{ kip}$$

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

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

Calculate Ultimate Moment Capacity

Extreme Tensile Strain = 0.0028 Within Transition Zone
$$M_n = M_{cf} + M_t = 47.2 \text{ kip*ft}$$

$$M_a = \Phi M_n = 42.5 \text{ kip*ft}$$

$$M_{cr} = 18.9 \text{ kip*ft}$$
 Cracking Moment (See Page 3)

Calculate Development Length

$$\begin{split} f_{se} = & 90.8 \text{ ksi} \\ f_{py} \, / \, f_{pu} = & 0.85 \\ \gamma_p = & 0.40 \end{split}$$
 Approximate $f_{ps} = (1 - (\gamma_p * p * f_{pu})) / (f'_c * \beta_1) * f_{pu} = 108.3 \text{ ksi} \quad \text{ACI } 318 - 14 \text{ Eqn } 20.3.2.3.1 \\ L_d = (f_{se}/3000) * d_b + (f_{ps} - f_{se})/1000 * d_b = 28.7 \text{ in} \quad \text{ACI } 318 - 14 \text{ Eqn } 25.4.8.1 \end{split}$

design: Musco Pole Design 1B



Pole Calcuations - Page 3

Calculation of Mcr and Other Properties

$$n_{t} = n - n_{c} = 5$$

 $d_p = \Sigma$ Elevations of Tendons in Tension/ $n_t = 5.40$ in

Distance from Centroid of Tension Steel to Center of Pole

$$d = d_p - r_o = 0.66 in$$

$$b_0 = D_0 - d_p = 4.08 \text{ in}$$



Area of the Outer Region Determined by b_o

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

Area of the Outer Region Determined by b_i

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

$$A_{ci}' = r_i^2 * cos - 1((r_i - b_i)/r_i) - ((r_i - b_i) * V((2 * r_i * b_i) - r_i^2)) = 4.3 in^2$$

$$A'' = A_{co}' - A_{ci}' = 24.7 \text{ in}^2$$

$$A_{tot} = \pi^* (r_o^2 - r_i^2) = 56.4 \text{ in}^2$$

$$b_{dp} = A_t = A_{tot} - A'' = 31.7 \text{ in}^2$$

$$f_r = 7.5*Vf'_c = 731.0 \text{ psi}$$

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

$$I_g = \pi/4 * ((D_0)^4 - (D_i)^4) = 380.449 \text{ in}$$

$$M_{cr} = (f_r + f_{pe})/A_t^* (I_g/r_o) = 18.9 \text{ k*in}$$

$$\rho = 0.0342$$

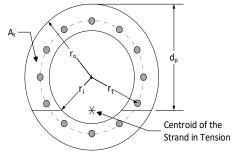
Total Concrete Area

Modulus of Rupture

Moment of Inertia of Gross Section

Cracking Moment (ACI 318-14 24.2.3.9)

Reinforcement Ratio



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 $A_{ps} = 0.217 \text{ in}^2$ Area of a Strand

E = 29000 ksi Modulus of Elasticity c = 4.19 in

LINE	LINE STRAIN	fps	FORCE	MOMENT
n	$S(e_b + \varepsilon_{se})$	(KSI)	(KIPS)	(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	0.00 0.0000	
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

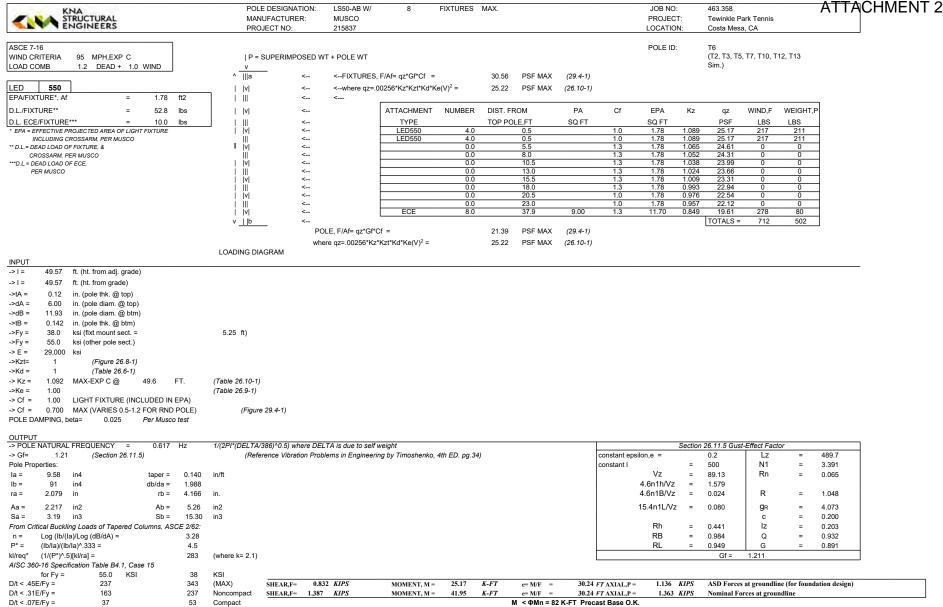
 $n_t = 6$ Number of Tendons c = 4.19 in From Iteration $r_o = 4.74$ in Outer Radius $\epsilon_{se} = 0.0031$ Prestressing Strain

 D_{tc} = 6.625 Diameter of Tendon Circle ϵ_{smax} = 0.0079 Maximum Tendon Yield Strain

a = 2.73 in \$1 * c

TENDO		ANGLE	TENDON ELEV		TOTAL	TENDON w/in	TENDON ELEV.
#	(FROM VERT) (RADIANS)	(FROM VERT) (DEGREES)	(INCHES) (FROM COMP. SIDE)	STRAIN ϵ_{b}	STRAIN $\varepsilon_h + e_{se}$	COMP. BLOCK? $(Y = 1, N = 0)$	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

11/7/2023 LS50-AB Wind T6



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

<0.10H=

59 Inch

Max. Deflection = 28.835 Inch

AASHTO 10.4.2

D/t < .11E/Fy =

58

84

Slender element Section for Uniform Compression

Distance																								0-AB Wind	110
from top	Outside Diameter	Pole				Cf		E3-4	E3-2 or E3-3 Design comp	Acting	F8.1-F8.4 Design flex.	Req'd flex.		H1-1b for	H1-1a for	2nd Order /1st Order		Reg'd shear	1st Order Delta	C2.2a P-Delta	A Total A		VEN	2	DEFL
of Pole	of Pole,D	thick,t	D/t	Kz	qz	Pole	kl/r	Fe	strength, Pn	unfactored, Pr	strength, Mn	strength, Mr	Pr/Pc	Pr/Pc <0.2	Pr/Pc ≥ 0.2	Moment	CSR	strength., F	Della	Moment	Moment	l a l	MOM DUE	M/I	DUE TO DL
FT	IN	IN		102	PSF	1 010	eqiv.	10	KIPS	KIPS	K-FT	K-FT	11/10	11/10 40.2	11/1020.2	FT-K	O.K.	KIPS	IN	FT-K	FT-K	ď	TO DL	141/1	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	Υ	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	Ϋ́	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	Ý	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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 20	8.26	0.120	68.9	0.986	22.78	0.7 0.7	283 283	3.56	8.63	0.595 0.605	29.49	10.1	0.083	0.413	N.A.	1.087	Y Y	0.660	11.4	0.9	11.0	0.9577	9.14	0.3616 0.3659	10.05
20	8.40 8.54	0.120 0.120	70.0 71.2	0.979 0.972	22.62	0.7	283	3.56	8.78 8.93	0.605	30.44 31.41	10.8 11.4	0.083 0.083	0.425 0.436	N.A. N.A.	1.086 1.084	Ϋ́Υ	0.673 0.687	10.6 9.9	0.9 1.0	11.7	0.9529 0.9482	9.74 10.35		9.40 8.78
22	8.68	0.120	71.2	0.972	22.46 22.29	0.7	283	3.56 3.56	9.08	0.627	32.39	12.1	0.083	0.436	N.A. N.A.	1.083	Ϋ́	0.700	9.9	1.0	12.4 13.1	0.9482	10.35	0.3696 0.3727	8.17
23	8.82	0.120	73.5	0.957	22.29	0.7	283	3.56	9.22	0.639	33.39	12.1	0.083	0.447	N.A.	1.083	Ϋ́	0.700	8.6	1.1	13.1	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.	1.082	Ý	0.714	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	Ϋ́	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	Ϋ́	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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	Υ	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 Y	1.233	1.2	1.6	29.3	0.9263	24.61	0.3488	1.04
41 42	11.10 11.24	0.142	78.2	0.849 0.849	19.61 19.61	0.7	283 283	3.56	13.75 13.92	0.984	62.25	28.9 30.2	0.086 0.086	0.534 0.543	N.A.	1.056 1.055	Υ Υ	1.248	1.0	1.6 1.7	30.6	0.923 0.9198	25.59 26.58	0.3489	0.84 0.66
42	11.24	0.142 0.142	79.1 80.1	0.849	19.61	0.7 0.7	283	3.56 3.56	13.92	1.001 1.019	63.76 65.29	30.2	0.086	0.543	N.A. N.A.	1.055	Υ	1.264 1.279	0.8	1.7	31.8 33.1	0.9198	26.58	0.3488 0.3487	0.66
43	11.52	0.142	81.1	0.849	19.61	0.7	283	3.56	14.10	1.036	66.84	32.8	0.087	0.551	N.A. N.A.	1.053	Ϋ́	1.279	0.6	1.7	34.4	0.9187	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	0.087	0.566	N.A.	1.051	Ϋ́	1.311	0.4	1.7	35.8	0.9137	29.66	0.3484	0.37
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.	1.030	Ϋ́	1.328	0.3	1.7	37.1	0.9078	30.73	0.3477	0.20
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	0.574	N.A.	1.040	NA	1.344	0.2	1.7	38.4	0.905	31.81	0.3477	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	0.0101	0.00

KNA STRUCTURAL ENGINEERS

Reference:	2022 CBC, ASCE 7-16					
Job Location:	Costa Me	esa, CA	A			
Site Class	D-Defaul	t	ASCE			
0.2 Sec MCE, Ss	1.312	g	ASCE			
1.0 Sec MCE, S ₁	0.469	g	ASCE			
Site Coeff., Fa	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			
$S_{DS} = 2/3S_{MS}$	1.050	g	ASCE			
$S_{D1} = 2/3S_{M1}$	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			
оитрит:						
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						
$V = C_SW$			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 \leq TL, Cs =1.5 SD1/T(R/I)	0.353	g	ASCE 7-16 Sect. 11.4.8 & Eqn. 12.8-3			
$C_{S} \text{ min} = 0.044S_{DS}I \ge 0.03$	0.046	g	ASCE 7-16 Eqn. 15.4-1			
if $S_1 \ge 0.6g$, C_8 min = $0.8S_1/(R/I)$	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	0.0=0	161	ASCE 7-16 Eqn. 12.4-1			
and Eh = pQ_E and Ev = $0.2S_{DS}D$	0.353 0.210	W D	ASCE 7-16 Eqn. 12.4-3 ASCE 7-16 Eqn. 12.4-4			
Load Combination, 1.2D + (pQe + $0.2S_{DS}D$)	U.Z IU	ט	7.00C 7-10 Eqn. 12. 7*4			
			2052 W			
Load Combination, 1.2D + (pQe + 0.2S _{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			

SEISMIC OTM =

ASCE7-16 Eqn. 12.8-11 & Section 12.8.5

41.95 kip-ft Wind OTM

WIND CONTROLS

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				· '	

22.76 kip-ft <

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design: Musco Pole Design 2B



Pole Calcuations - Page 1

ACI 318-14

Inputs

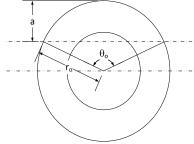
Pole Type	2B		$f_{py} =$	230.0 ksi	Strand Yield Strength
D _o =	11.92 in	Outer Diameter	$f_{pu} =$	270.0 ksi	Strand Ultimate Strength
D _i =	5.625 in	Inner Diameter	f' _c =	9.5 ksi	28 Day Strength of Concrete
$D_{tc} =$	9 in	Diameter of Tendon Circle	E _s =	29000.0 ksi	Elastic Modulus of Strand
$d_t =$	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 in ²	Area of Single Strand	a =	3.69 in	
Φ=	0.90	Resistance Factor	c =	5.67 in	
$\beta_1 =$	0.65	f _{'c} ≥ 8 ksi			

Determine Concrete Compression Forces (Bending Only)

Calculate the Properties of the Compression Zone

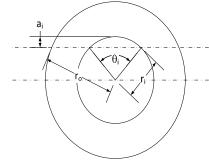
A. Calculate the Section Properties based on Outer Radius (Note: These Calculations Assume there is no core in the pole)

$$\begin{split} c_o &= D_o/3 = & 3.97 \text{ in} \quad \text{Initial Guess} \\ r_o &= D_o/2 = & 5.96 \text{ in} \\ \Theta_o &= 2 * \cos^{-1}((r_o - a)/r_o) = & 2.36 \\ I_o &= r_o^4/8 * \Theta_o.\sin(\Theta_o) + (2*\sin(\Theta_o)*\sin(\Theta_o/2)^2) = & 450.9 \text{ in}^4 \\ A_o &= (r_o^2*\cos^{-1}*(r_o - a)/r_o) - ((r_o - a)*V((2*r_o * a) - a^2) = & 29.36 \text{ in}^2 \\ y_{ro} &= (4*r_o*\sin(\Theta_o/2)^3)/(3*(\Theta_o-\sin(\Theta_o))) = & 3.80 \text{ in} \end{split}$$



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

$$\begin{split} r_i &= D_i/2 = & 2.81 \text{ in} \\ a_i &= & 0.54 \text{ in} \\ \Theta_i &= 2 * \cos^{-1}((r_i - a_i)/r_i) = & 1.26 \\ I_i &= r_i^4/8 * \Theta_{i\cdot} \sin(\Theta_i) + (2*\sin(\Theta_i)*\sin(\Theta_i/2)^2) = & 7.5 \text{ in}^4 \\ A_i &= (r_i^{2*}\cos^{-1*}(r_i - a)/r_i) - ((r_i - a)*v((2*r_i * a) - a^2) = & 1.2 \text{ in}^2 \\ y_{ri} &= (4*r_i^* \sin(\Theta_i/2)^3)/(3*(\Theta_i - \sin(\Theta_i))) = & 2.49 \text{ in} \end{split}$$



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 in ²	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
$A' = \pi^*(r_0^2 - r_i^2) - A_c =$	58.6 in ²	Area of the Tension Zone with the Strand Included



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.

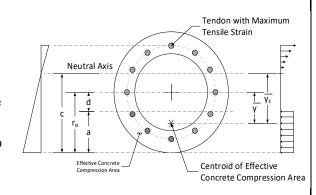
$$A_{pscomp} = N_c * A_{ps} = 0.46 in^2$$

Effective Area of Concrete in Compression

$$A_e = A_c - A_{pscomp} = 27.69 \text{ in}^2$$

C. Compute the Compression Force

$$F_c = A_e * 0.85 * f'_c = 223.6 \text{ kip}$$



Determine Steel Tensile Forces

Calculate the Total Prestressing Force.

$$\begin{split} f_{se} &= \text{IPF * PLF * } f_{pu} = & 141.7 \text{ ksi} & \text{Total Prestressing Stress} \\ \epsilon_{se} &= f_{se}/E_s = & 0.0049 & \text{Prestressing Strain} \end{split}$$

$$f_{py}/E_s = \quad 0.0079 \qquad \text{Maximum Tendon Yield Strain}$$

$$F_{ps} = \epsilon_{se} * A_{st} * E_s = \qquad 21.7 \qquad \text{Force in Single Prestress Strand}$$

$$F_t = \Sigma$$
 Line Forces = 223.6 kip From the Tension Line Table

Converge the Forces to Achieve a Balance Condition

$$F_c - F_t = 0 \text{ kip}$$

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

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

Calculate Ultimate Moment Capacity

$$M_n = M_{cf} + M_t = 91.6 \text{ kip*ft}$$
 $M_a = \Phi M_n = 82.4 \text{ kip*ft}$

Calculate Development Length

$$f_{se} = 141.7 \text{ ksi}$$

$$f_{py} / f_{pu} = 0.85$$

$$\gamma_p = 0.40$$

Approximate
$$f_{ps} = (1-(\gamma_p * \rho * f_{pu}))/(f'_c * \beta_1) * f_{pu} = 176.9 \text{ ksi}$$
 ACI 318-14 Eqn 20.3.2.3.1
 $L_d = (f_{se}/3000) * d_h + (f_{ps}-f_{se})/1000 * d_h = 41.2 \text{ in}$ ACI 318-14 Eqn 25.4.8.1

design: Musco Pole Design 2B



Pole Calcuations - Page 3

Calculation of Mcr and Other Properties

$$n_{t} = n - n_{c} = 7$$

 $d_p = \Sigma$ Elevations of Tendons in Tension/ $n_t = 7.64$ in

Distance from Centroid of Tension Steel to Center of Pole

$$d = d_p - r_o = 1.68 in$$

$$b_0 = D_0 - d_p = 4.28 \text{ in}$$

Area of the Outer Region Determined by b_o

$$A_{co}' = r_o^2 * cos^{-1}((r_o - b_o)/r_o) - ((r_o - b_o) * v((2 * r_o * b_o) - r_o^2)) = 36.0 in^2$$

Area of the Outer Region Determined by b_i

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

 $A_{ci}' = r_i^2 * cos - 1((r_i - b_i)/r_i) - ((r_i - b_i) * V((2 * r_i * b_i) - r_i^2)) = 3.6 in^2$

$$A'' = A_{co}' - A_{ci}' = 32.4 \text{ in}^2$$

$$A_{tot} = \pi^*(r_0^2 - r_i^2) = 86.7 \text{ in}^2$$

$$b_{dp} = A_t = A_{tot} - A'' = 54.3 \text{ in}^2$$

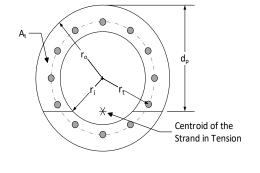
$$f_r = 7.5*Vf'_c = 731.0 \text{ psi}$$

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

$$I_g = \pi/4 * ((D_o)^4 - (D_i)^4) = 941.86 in$$

$$M_{cr} = (f_r + f_{pe})/A_t^* (I_g/r_o) = 42.5 \text{ k*in}$$

$$\rho = 0.0197$$



Total Concrete Area

Modulus of Rupture

Moment of Inertia of Gross Section

Cracking Moment (ACI 318-14 24.2.3.9)

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 $A_{ps} = 0.153 \text{ in}^2$ Area of a Strand

E = 29000 ksi Modulus of Elasticity c = 5.67 in

LINE	LINE STRAIN	fps	FORCE	MOMENT
n	$S(e_b + \varepsilon_{se})$	(KSI)	(KIPS)	(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 $\epsilon_{se} = 0.0049$ Prestressing Strain

 D_{tc} = 9 Diameter of Tendon Circle ϵ_{smax} = 0.0079 Maximum Tendon Yield Strain

a = 3.69 in \$1 * c

TENDO		ANGLE	TENDON ELEV		TOTAL	TENDON w/in	TENDON ELEV.
#	(FROM VERT)	(FROM VERT)	(INCHES)	STRAIN	STRAIN	COMP. BLOCK?	TO THOSE IN TEN.
	(RADIANS)	(DEGREES)	(FROM COMP. SIDE)	ϵ_{b}	ε_{b} + e_{se}	(Y = 1, N = 0)	(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

ATTACHMENT 2

KNA STRUCTURAL ENGINEERS

DESIGN OF EMBEDDED POLE FOOTING-NONCONSTRAINED 2019 CBC Section 1807.3.2.1

Mark/Type			LS50-A	LS50-AB
Grade				
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 ₁ b)		=	1.14	1.48
Min req'd embedment, d	ft	=	6.64	7.88
=A/2{1+(1+4.36h/A) ^{1/2} }				
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: ||

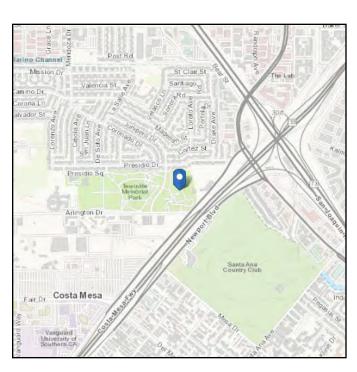
Soil Class: D - Default (see

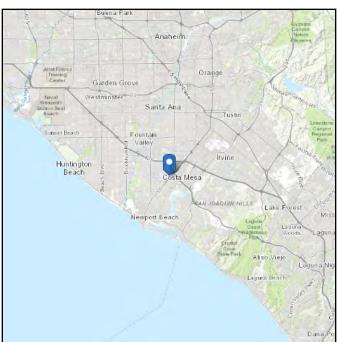
Section 11.4.3)

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:

 $S_{\mbox{\scriptsize S}}$: S_{D1} : 1.312 N/A T_L : S₁ : 0.469 8 F_a : 1.2 PGA: 0.565 F_v : N/A PGA_M: 0.677 S_{MS} : F_{PGA} : 1.574 1.2 S_{M1} : N/A I_e : 1 S_{DS} : 1.05 C_{ν} : 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: <u>USGS Seismic Design Maps</u>



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.

ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

POLE FOUNDATION SCHEDULE (SEE LIGHT POLE FOUNDATION DETAIL)

	ASD GROUP	NDLINE FORCES	(MAXIMUM)	C.I.P. DEEP FOUNDATION			
TYPE	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, ⊺14	LSS50-A	1B	2 LED550	3.0				
T2, T3, T5, T7, T10, T12			4 LED550	6.4				
T13	LSS50-AB	2B	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.

-UNDISTURBED, IN-SITU SOIL-(SEE GENERAL NOTES)

CONCRETE FOUNDATION

LIGHT POLE FOUNDATION DETAIL SCALE: NO SCALE

LIGHT STRUCTURE -

LIGHT STRUCTURE PRECAST BASE BY MUSCO LIGHTING, INC.

(SEE POLE

FINISHED -GRADE

IDENTIFICATION)

STEEL POLE BY MUSCO LIGHTING, INC.

IDENTIFICATION)

(SEE POLE

	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 (PCI CERTIFIED) BASES		FABRICATOR EXEMPT. → REFERENCE ICC ESR-3765.								
4. STRUCTURAL STEEL (LA. 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 ACT 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 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

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 FREEPALL 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.

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

DATE

11/07/23

SHEET

C1

OF 1





Equipment Descrip	ption
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.



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.			



Equipment Descrip	tion
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.



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.



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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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. <u>BID SUBMISSION AND OPENING</u>: 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.

 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. <u>BID CONTENTS</u>: 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. <u>BID SECURITY</u>: Each bidder must submit an <u>original</u> 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. <u>NO electronic bid securities through e-mail or other electronic means will be accepted.</u>
- 6. <u>CONTRACTOR'S LICENSE</u>: A valid <u>California Contractor's License Class "C-10" (Electrical Contractor)</u> 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.
- 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. <u>RETENTION</u>: 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. <u>NON-DISCRIMINATION</u>: 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. <u>CITY'S RIGHT TO REJECT BIDS</u>: 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. <u>ADDITIONAL REQUIREMENTS</u>: 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 <u>robert.ryan@costamesaca.gov</u>.

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. <u>QUALIFICATION OF BIDDERS</u>: 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. <u>BID SECURITY / BID BOND</u>: Each bid shall be accompanied by either cash, cashier's 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. <u>NO electronic bid securities through e-mail or other electronic means will be accepted.</u>
- 4. <u>NONCOLLUSION AFFIDAVIT</u>: Each bid shall be accompanied by a notarized Noncollusion Affidavit on a form which is included in the Contract Documents.
- 5. <u>SIGNATURE</u>: 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. <u>CORRECTIONS</u>: Any corrections made to the submitted bid must be made electronically via *PlanetBids*.
- 7. <u>DELIVERY OF PROPOSAL:</u> Proposals shall be submitted electronically via PlanetBids: <u>https://www.planetbids.com/portal/portal.cfm?CompanyID=45476</u>. No other form of submittal shall be accepted by the City.
- 8. <u>BID DEPOSIT RETURN</u>: 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. <u>TAXES:</u> 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. <u>WITHDRAWAL OF BIDS</u>: 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. <u>AGREEMENT AND BONDS</u>: 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. <u>FORFEITURE FOR FAILURE TO POST SECURITY AND EXECUTE AGREEMENT</u>: 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. <u>BIDDERS INTERESTED IN MORE THAN ONE BID</u>: 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. In Interpretation of the drawings of 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. <u>ADDENDA:</u> 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. <u>QUESTIONS TO THE ENGINEER:</u> 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. <u>EQUIVALENT MATERIALS:</u> 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. <u>LEGAL RESPONSIBILITIES</u>: 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. <u>ANTI-DISCRIMINATION</u>: 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. <u>DRUG-FREE WORKPLACE POLICY</u>: 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. <u>BID PROTEST PROCEDURES</u>: 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. <u>ASSEMBLY BILL 626</u>: 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:

P-1 BID PROPOSAL

	BID SCHEDULE	PROPO	SAL		
ITEM #	BID ITEM DECRIPTION	QTY.	UNIT	UNIT PRICE (in figures)	ITEMS TOTAL (in figures)
LEDI	IGHTING INSTALLATION AT CITY PARK	S AND A	ATHLE	TIC FACILIT	TES:
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 <u>City reserves the right to delete one or more bid items and/or to increase and/or to decrease bid items' quantities</u>.

The CITY also reserves the right to reject all Bids.

PROPOSAL BID SCHEDULE (CONTINUED)

NOTES:

- 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*.

PROPOSAL SCHEDULE (CONTINUED)

(Please Type or Print)

Total Amount for Base Bid (in written words)
(\$)
Contractor's Lawful Name:	in figures
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:	
Name	Telephone Number: () Mobile No.: ()
Name	Telephone No.: () Mobile No.: ()
Name	Telephone No.: () Mobile No.: ()

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.

ATTACHMENT 2

Project and Specification No. 23-09

Respectfully Submitted,

		osa Nama			T:41 -
	Contractor's Busin	ess name		Contractor	Title
Business Address: Street			_	Singed By	Title
City State Zip			_	Contractor's License No. and C	Classification Exp. Date
Business Phone Number			<u> </u>	Date	9
	Name	Title	_	Residence	: Street
City	State	Zip	_	Residence pho	ne Number
f the bid is by	y a corporatior ation and whe	n, state the names ther more than on	of the o	fficers who can sign an a must sign.	greement on behalf
☐ Corpor	ation		٦	Гахрауег I.D. Number: _	
Vame				Can Sign □	Must Sign □
				Ä	
	by a partners joint ventures		ure, sta	te the names and addre	esses of all general
partners and	joint ventures ship or Joint V	entures	٦	Гахрауег I.D. Number: _	·
partners and Partners Name	joint ventures	entures	7	Гахрауег I.D. Number: _	·
partners and Partners Name Address	joint ventures	entures	٦	Гахрауег I.D. Number: _	·
Dartners and Partners Name Address Name	joint ventures	entures	7	Гахрауег I.D. Number: _	•
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P-3 PROPOSAL SCHEDULE

Addendum No. Date Received Bidder's Signature CONSTRUCTION PROJECT REFERENCES In order to more fully evaluate your firm's background and experience for the proherein proposed, it is requested that you submit a list of Public Works and/or sim construction projects completed, or in progress, within the last 24 months. Information will be used to evaluate whether the bid is responsive and or responsible the call for bids. Date Project Awarded Awarding Agency Agency's Contract Administrator Continuous Information	ject
CONSTRUCTION PROJECT REFERENCES In order to more fully evaluate your firm's background and experience for the proherein proposed, it is requested that you submit a list of Public Works and/or sinconstruction projects completed, or in progress, within the last 24 months. Information will be used to evaluate whether the bid is responsive and or responsible the call for bids. Date Project Awarded Awarding Agency Agency's Contract Administrator Contract Administrator Contract Administrator Contract Administrator Contract Administrator Contract Administrator Contract Co	ject
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<u>Awarding Agency</u> <u>Administrator Contaguation Administrator Con</u>	his e to
	<u>act</u>

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 ($\frac{1}{2}$) 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 ($\frac{1}{2}$) 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 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,
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,
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 Surety/Power of Attorney (Notary Acknowledgement to be attached) (Notary Acknowledgment to be attached)

P-6 BIDDERS BOND

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 I 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
Subscribed and sworn to before me by:	Signature
This, 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.

		Company/Business	Name of	
Date	Name of Donor	Affiliation	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 law is true and correct.	s of the State of California that the foregoing
Bidder/Applicant/Proposer	
Date	
	

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 including but not limited to the following:

The proposal form P-1 through P-9b. Notice Inviting

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 The legal address of the Contractor shall be the CONTRACTOR address given on the Contractor's bid and is hereby

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 <u>fourteen (14) days from Notice of Award</u> 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: <u>less than 1 acre</u> (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 offsite. 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 aheadschedule 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 <u>ten (10) Working Days</u> 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

Initial Review

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 Fax: 800/374-6402



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:
 - 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.
 - 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'

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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.

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TECHNICAL SPECIFICATIONS FOR BARK PARK ATTACHMENT 2

- 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.
- 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.

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TECHNICAL SPECIFICATIONS FOR BARK PARK ATTACHMENT 2

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 <u>DELIVERY TIMING</u>

A. Delivery Timing Equipment On-Site: The equipment must be on-site 10-12 weeks from receipt of

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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.

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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.
Layout			Drawing(s) showing field layouts with pole locations
	С	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.
	Н	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.
	К	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.

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TECHNICAL SPECIFICATIONS FOR BARK PARK ATTACHMENT 2

	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.					
Ī	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:		

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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.
- 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.
- Contact your local UDig for locating underground public utilities and confirm they have been clearly marked.
- 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.
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- 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.



TECHNICAL PROVISIONS FOR BARK PARK

ATTACHMENT 2

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.

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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:

Scan: 215827A Document ID: 215827P1V1-0228160557

Distribution Panel Location or ID: Bark Park

Total # of Distribution Panel Locations for Project:

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

Total Off/On/Auto Switches:

of distribution panel

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
- 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.

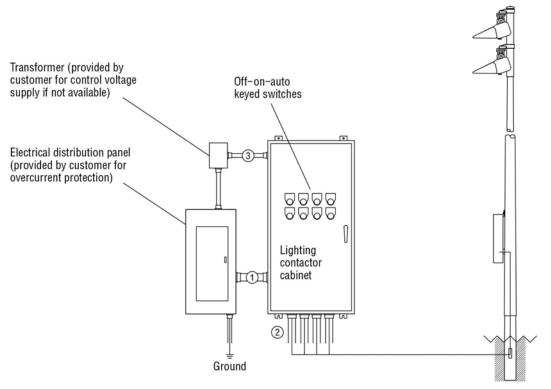
NOTE: Refer to Installation Instructions for more details on equipment information and the installation requirements.



Control System Summary

Tewinkle Park Bark Park / 215827 - 215827A Bark Park - Page 2 of 4

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).

TECHNICAL PROVISIONS FOR BARK PARK





Control System Summary

Tewinkle Park Bark Park / 215827 - 215827A Bark Park - Page 3 of 4

SWITCHING SCHEDULE

Field/Zone Description Zones 1

CONTROL POWER CONSUMPTION								
120V Single Phase								
VA loading	INRUSH: 1225.0							
of Musco								
Supplied SEALED: 130.0								
Equipment								

CIRCUIT SUMMARY BY ZONE									
POLE	CIRCUIT DESCRIPTION	# OF FIXTURES	# OF DRIVERS	*FULL LOAD AMPS	CONTACTOR SIZE (AMPS)	CONTACTOR	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.





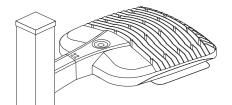
Control System Summary

Tewinkle Park Bark Park / 215827 - 215827A Bark Park - Page 4 of 4

			PANEL SUMMARY			
CABINET #	CONTROL MODULE LOCATION	CONTACTOR	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



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

RoHSCompliant

Photometric Characteristics

Lumen maintenance factor²

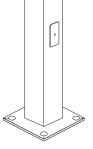
50k hours ³ 0.9	7
75k hours³0.9	5
100k hours ³ 0.9	3
CIE correlated color temperature5700	K
Color Rendering Index (CRI), minimum7	0'
1.00	

25k hours³......0.99

*See project information for pole details

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.



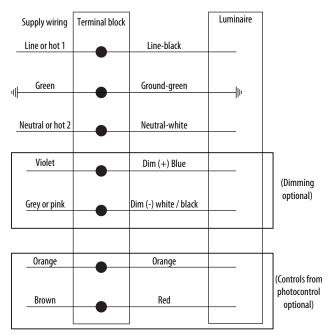


Datasheet: OSQ™ Area Luminaire on Valmont® Soft Square Pole

Electrical Data

Rated wattage per luminaire¹.....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 mode² 0 – 10 V dimming to 10%

Typical Wiring



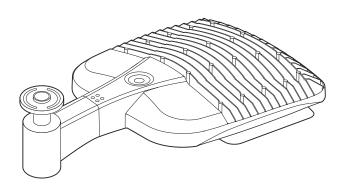
	120 Vac	208 Vac	240 Vac	277 Vac	347 Vac	480 Vac
Max operating current ³	0.89 A	0.51 A	0.43 A	0.39 A	0.31 A	0.22 A

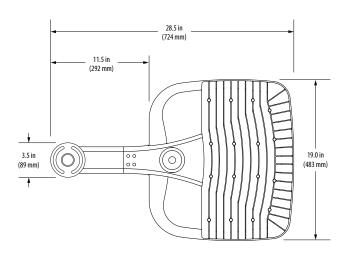
Footnotes:

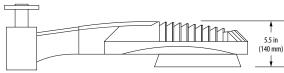
- 1) Rated wattage is the power consumption, including driver efficiency losses, at stabilized operation in 25°C ambient temperature environment.
- 2) Dimming controls not provided by Musco. Driver provides 10 V source current at 1.0 mA, compliant with IEC 60929 Annex E dimming standard.
- 3) Operating 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	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	Α			
P12-P13	27'	27'	2	CREE OSQ	0.21 kW	Α			
13			37		3.85 kW				

Circuit Summ	ary		
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 Summar	у							
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty
Grid Name	Calculation Wetric	Ave	Min	Max	Max/Min	Ave/Min	Circuits	Fixture Qty
Dog Park	Horizontal Illuminance	3.39	1	8	11.43	3.39	Α	37

From Hometown to Professional











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EQI	EQUIPMENT LIST FOR AREAS SHOWN										
	Р	ole			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			
12			TOTALS			37	37	n			

^{*} This structure utilizes a back-to-back mounting configuration





ENGINEERED DESIGN By: Vashon Alexander · File #215827A · 28-Feb-22

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \otimes

Tewinkle Park Bark Park 2

Costa Mesa,CA

GRID SUMMARY	
Name:	Dog Park
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION S	UMMARY
MAINTAINED HORIZONTA	AL 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 INFORMATIO	N
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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SCALE IN FEET 1:80

Pole location(s) \bigoplus dimensions are relative to 0,0 reference point(s) \bigotimes

Tewinkle Park Bark Park 2

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							

* 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)					2	
Single Phase Voltage	208	220	240 (60)	277 (60)	347 (60)	380	480 (60)
Cree OSQ	-	-	-	-	0.3	-	0.2



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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 Toll Free: 800/756-1205 Fax: 800/374-6402



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:
 - 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.
 - 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.

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTSATONICAL 2

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,	80'
	C2, S1- S6	

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

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTSATONICAL 2

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.
 - 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

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTS AT ONCE 12

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.

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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 <u>DELIVERY TIMING</u>

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.
 - 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

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTSATONICAL 2

- 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.

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTSATO ANCHOMENT 2

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.
	В	Equipment Layout	Drawing(s) showing field layouts with pole locations
	С	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.
	н	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.
	К	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.
	М	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.

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TECHNICAL SPECIFICATIONS FOR JACK HAMMETT SPORTSATO ANCHOMENT 2

N	Non-	Manufacturer shall list all items that do not comply with the specifications. If in full compliance,
IN	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:

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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.
- 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.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

ATTACHMENT 2

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.

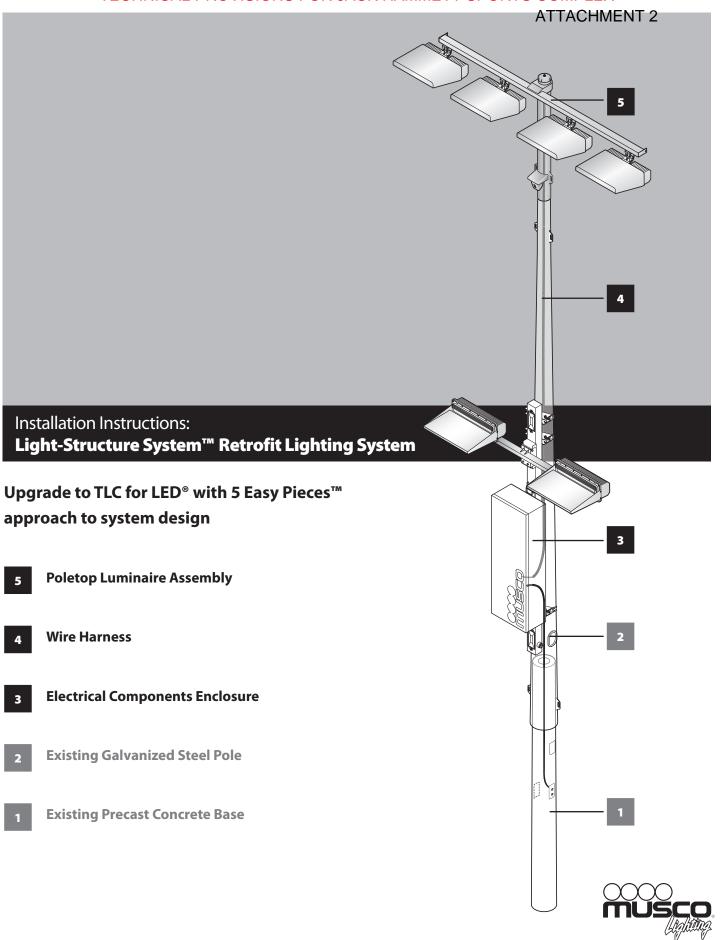
- a. Review and understand installation instructions are provided with every product installation.
- b. Education of installation personnel to allow for highest efficiency and lowest possibility of failure.
- c. Verify that components have been assembled per Musco installation instructions.
- d. Verify 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.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX



We Make It Happen.

ATTACHMENT 2 Installation Instructions: Light-Structure System™ Retrofit Lighting System

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ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

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.



ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

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 $\frac{3}{2}$, $\frac{7}{6}$ and $\frac{9}{6}$ 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
% in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	11-32
11/16 in socket, extension, breaker bar, and 11/16 in wrench	Tightening structural fasteners	13, 31
% in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	26
⅓₂ in hex key	Attaching handhole covers on base and steel pole	33, 35
¾ in hex key	Attaching grounding conductors inside electrical enclosure	35
% 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	Asseml	bly C	Prawing
--	-------	------	--------	-------	---------

- ☐ 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.

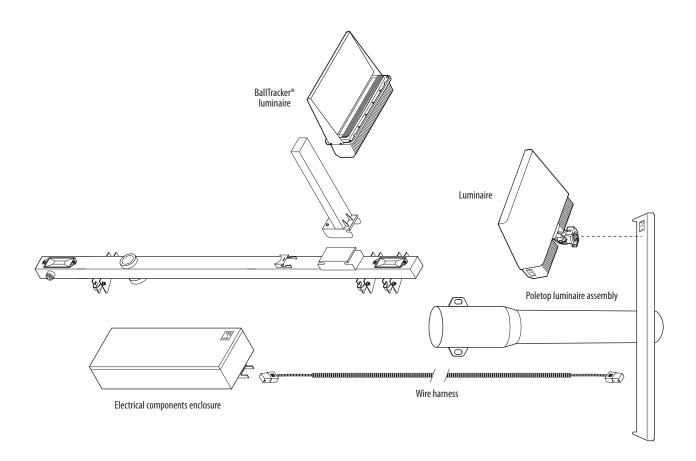
Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

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





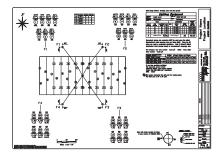
Before You Begin

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:

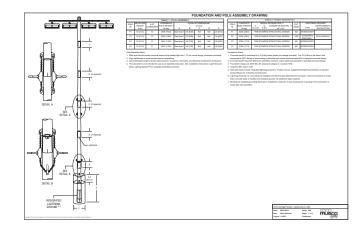
- Control system diagram and details
- Contactors and cabinets
- · Lighting circuits
- Voltage, phase, and frequency
- Full load current for each circuit



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





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.







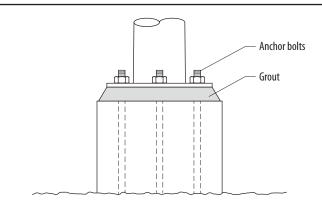


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Before You Begin

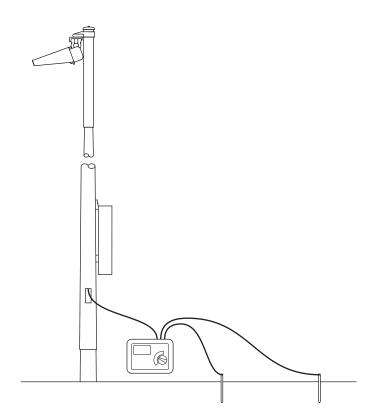
Inspections

- A qualified inspector must examine the base and pole sections for damage or prior field modifications.
- Repair grout on baseplate poles (if necessary).

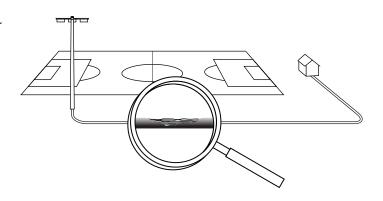


If pole is equipped with an external ground rod, test earth ground connection of pole. If greater than 25 ohms, install additional ground rod and retest.

Repeat until < 25 ohms.



- 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.





TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Disassembly

Overview

Remove the existing equipment to be replaced: electrical components enclosures, wire harness, and poletop luminaire assembly (or bolt-on crossarms).

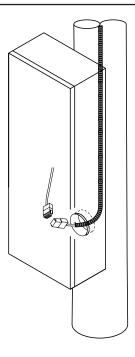
Tools/Materials Needed

Mu □	sco Supplied (For bolt-on crossarms.) 1¼ in socket, ¾ in drive
	Breaker bar, ¾ in drive
	4 in extension, ¾ in drive
	11/16 in wrench
Cor	ntractor Supplied %6 in wrench, %6 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

In electrical components enclosure, disconnect pole harness from enclosure harness. Feed end of pole harness into pole interior. Cut off connector if necessary.



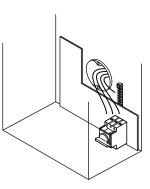


Warning

Risk of electrical shock

Ensure all circuits are disconnected before proceeding

- Disconnect electrical supply wiring and equipment grounding conductor.
- Remove wire harnesses between top, middle, and bottom boxes.
- Remove wiring between stacks.



Disassembly

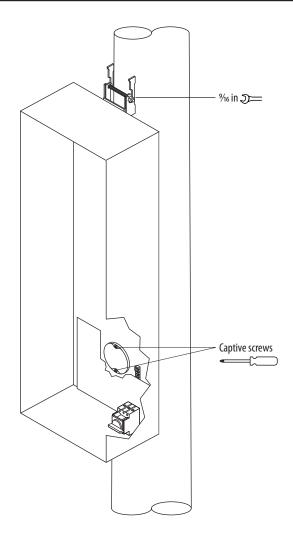
- Using % in wrench and Phillips screwdriver, loosen enclosure hanger bolts, and captive hub screws.
- Using a crane and sling, remove enclosures from the stack, starting at the top.

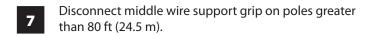


Caution

Electrical components enclosures are heavy.

Enclosures may weigh up to 225 lb (102 kg). Lift with caution.







Leave the pole harness connected to the poletop luminaire assembly. It will pull out as the poletop is removed.





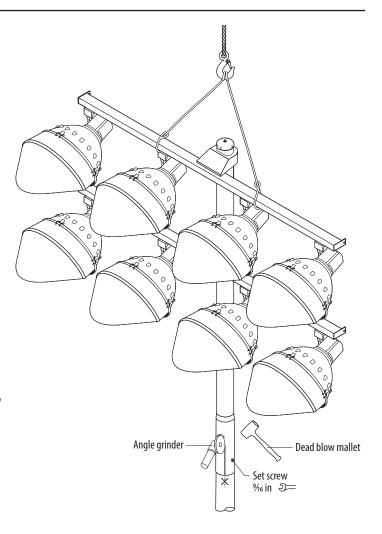
Disassembly

- 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*.
- Using % in wrench, loosen set screw.
- 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.

- 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.
- Tap on the poletop with a dead blow mallet until it begins to move and separate.

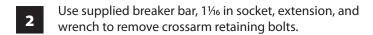


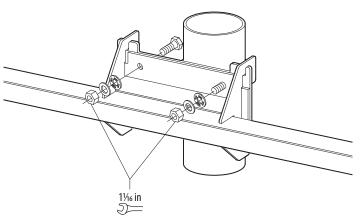


Disassembly

Bolt-On Crossarm Removal

Use crane and sling to support crossarm.







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

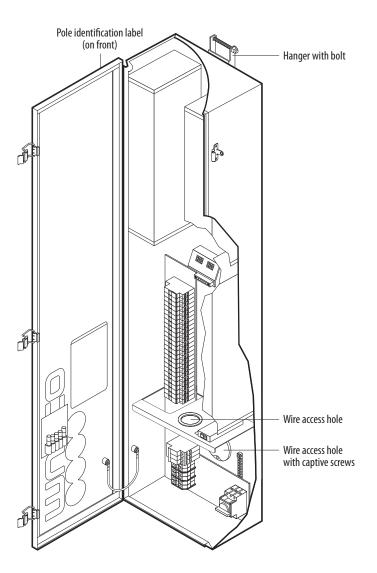
- ☐ ½ and % in offset combination wrenches
- Snips
- ☐ Field Aiming Diagram

Contractor Supplied

- ☐ Torque wrench with ½ and ¾ 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

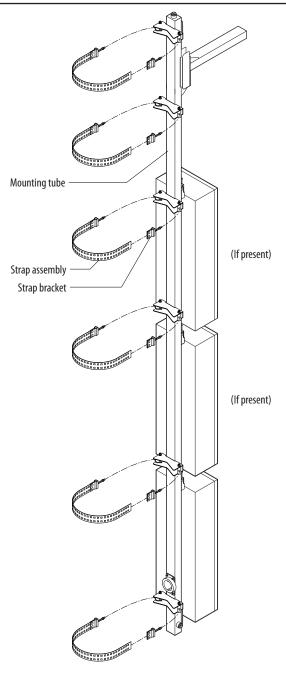
Diameter	Round Pole Strap Length
0-17 in (0-432 mm)	45 in (1143 mm)
17.01 – 22 in (432 – 559 mm)	60 in (1524 mm)
22.01 – 28 in (559 – 711 mm)	78 in (1981 mm)
28.01 – 34 in (711 – 864 mm)	96 in (2438 mm)
34.01 – 40 in (864 – 1016 mm)	114 in (2896 mm)
40.01 – 46 in (1016 – 1168 mm)	132 in (3353 mm)

Square Pole Strap and Bracket Selection

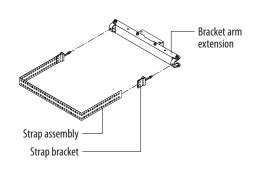
Width	Strap Length	Bracket Arm Extension Width
0 – 12 in (0 – 304 mm)	45 in (1143 mm)	14 in (356 mm)
12.01 – 16 in (304 – 406 mm)	60 in (1524 mm)	18.5 in (470 mm)
16.01 – 20 in (406 – 508 mm)	78 in (1981 mm)	22.5 in (572 mm)
20.01 – 24 in (508 – 610 mm)	96 in (2438 mm)	26.5 in (673 mm)
24.01 – 28 in (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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ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Electrical Components Enclosure and BallTracker® Luminaire



Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

Assembly Procedure

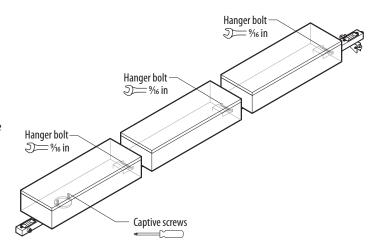


Caution

Electrical components enclosures are heavy.

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

- Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillipshead screwdriver. Tighten hanger bolt with % in wrench.
- Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with % in wrench.

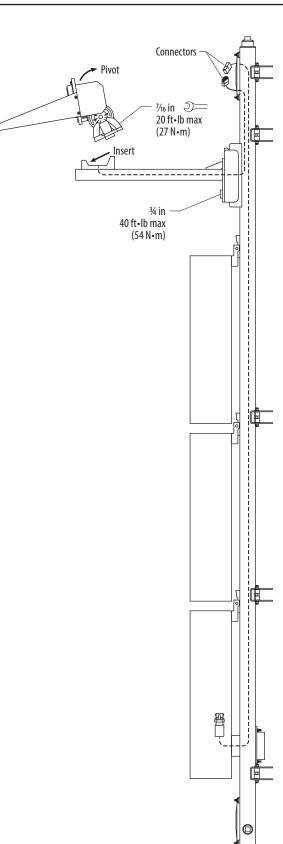


Electrical Components Enclosure and BallTracker® Luminaire

- 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).
- 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.
- Attach luminaire using % in wrench. Tighten captive screws until fully tight. Do not exceed 20 ft-lb (27 N-m).
- Pull BallTracker® wire harness through tube.
 Feed bottom of harness into enclosure hub.
- 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.
- Attach support grips at top handhole.
- Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.



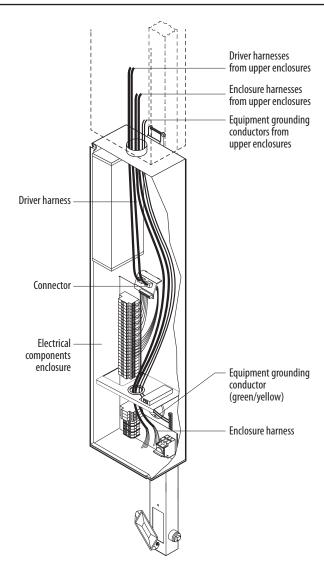


Electrical Components Enclosure and BallTracker® Luminaire



Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician.

- Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.
- Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.



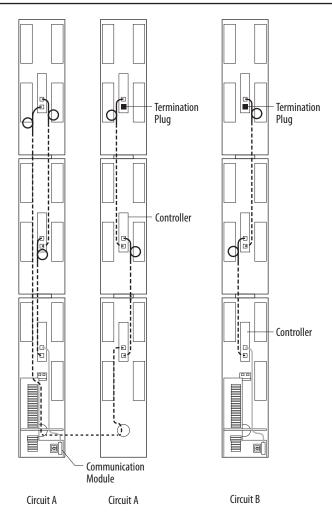


Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 9–10 if controller not present

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.





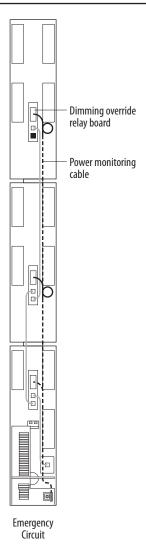
Electrical Components Enclosure and BallTracker® Luminaire



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

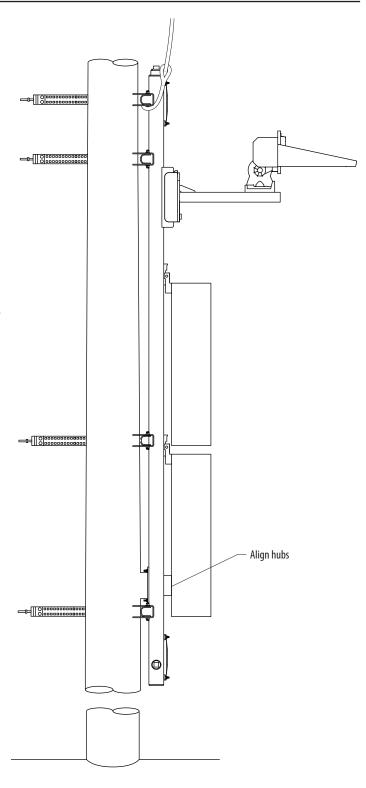
Align hub on tube with pole hub.



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

- 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.
- Attach brackets to pole. Torque 5% in strap bracket hardware A to 12 ft•lb (16 N•m) using ½ in socket and torque wrench. Torque all % in tensioning nuts B to 20 ft•lb (27 N•m) using % in socket and torque wrench.

Λ

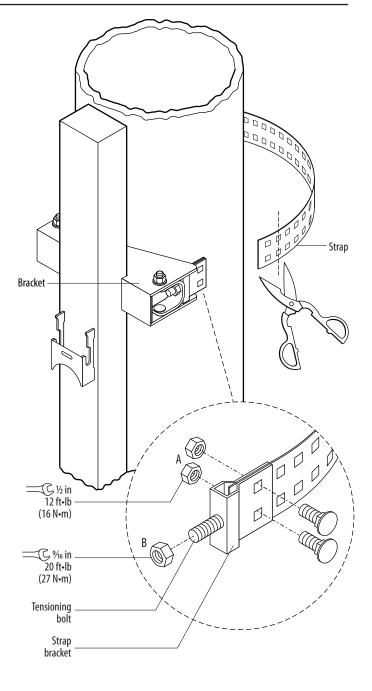
Caution

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.

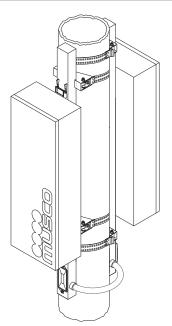




Electrical Components Enclosure and BallTracker® Luminaire

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.



ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

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

☐ 1/16 in ratcheting combination wrench



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 7/6 in socket

Assembly Procedure



Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.



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

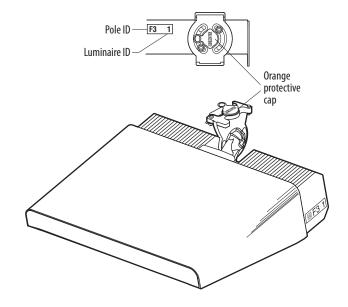
Rotation may be required to assemble all luminaires onto the poletop luminaire assembly. Do not stand under poletop when lifting. Steady with two people holding crossarms. Allow for poletop to safely rotate around when it is high enough for crossarms to clear the ground.



Caution

Equipment Damage

Properly support poletop to ensure luminaires do not get damaged.





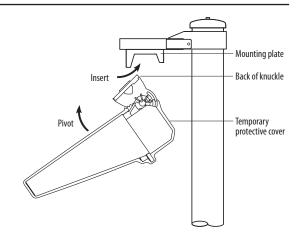
Luminaire Attachment

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.



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Luminaire Attachment

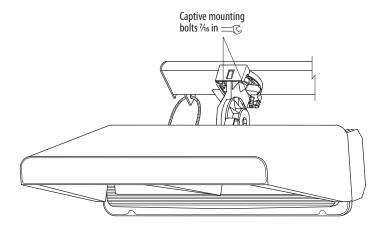
Tighten captive mounting bolts. Orange tag will break loose before all bolts are fully tight - continue tightening. Torque must not exceed 20 ft-lb (27 N-m). To avoid overtightening, use provided 7/16 in

combination wrench.

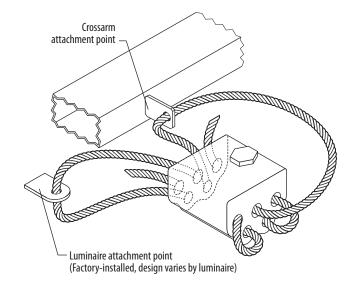


Warning Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



- 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.
- Using \(\frac{7}{6} \) in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).





TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

Installation Instructions: **Light-Structure System™ Retrofit Lighting System**

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	
----------------	--

Contractor Supplied

- ☐ Musco Pole Assembly Drawing
- ☐ Two 1½ ton chain come-alongs

- ☐ % in wrench
- Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)



If pole utilizes bolt-on bars, skip to next section. See Musco *Pole Assembly Drawing*.

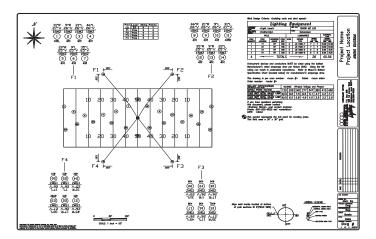
Assembly Procedure



Verify pole ID on each poletop luminaire assembly matches pole location on *Field Aiming Diagram*. Pole ID is labeled on crossarm.

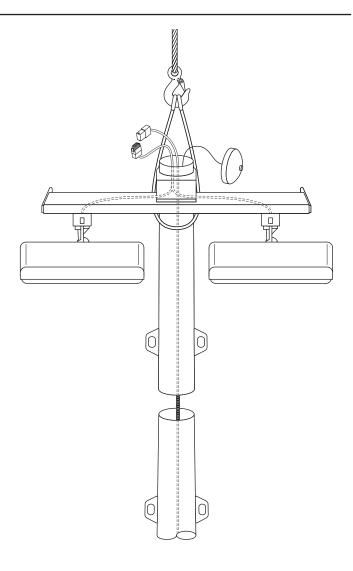
1

Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



Poletop Luminaire Assembly

- Turn on pole alignment beam.
- Hook pole harness wire support grip to the poletop luminaire assembly u-hook and bundle the pole harness to the bottom crossarm.
- Lubricate top of steel pole section with supplied dishwashing liquid.
- Sling and lift poletop luminaire assembly into place.
- 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



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.

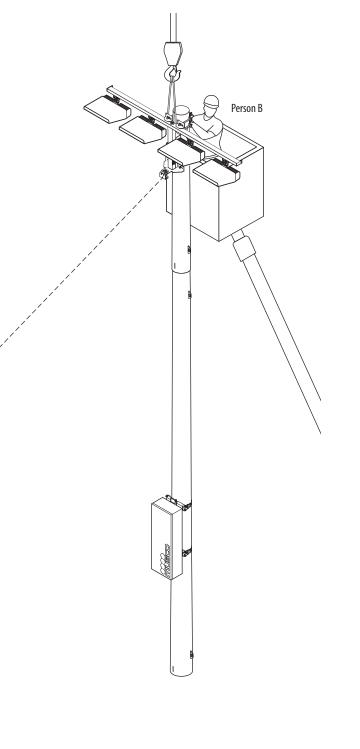
Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



Warning

Falling material hazard

If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.





Person A

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

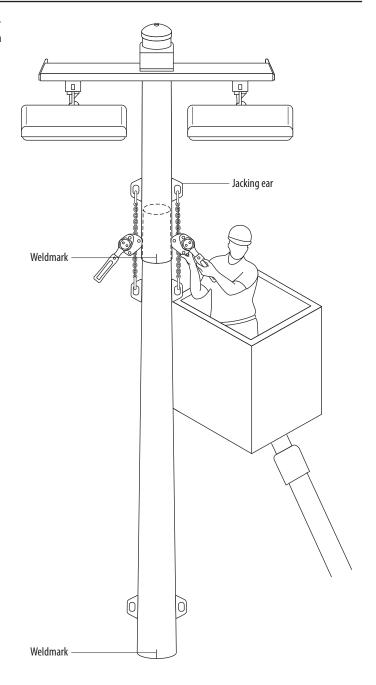
Using two 1½ ton come-alongs, pull poletop luminaire assembly onto pole evenly until tight. Ensure minimum overlap per Musco *Pole Assembly Drawing*.



Ensure alignment is maintained while tightening.

9

Tighten set screw using % in wrench.



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 1¼6 in socket
- ¾ in drive breaker bar
- ¾ in drive 4 in extension
- ☐ 1½ in wrench
- Spreader bars
- → ¾ in fasteners (for spreader bars)
- 5% in structural fasteners
- ☐ % in wrench

Contractor Supplied:

☐ Torque wrench with % 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.



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.

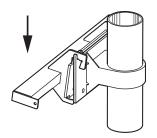
Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2

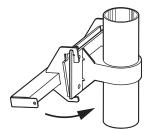
Position crossarm as shown below.



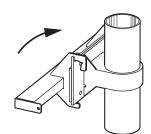
Ensure crossarm wire harness is not pinched between mating plates.











Crossarm

Crossarm wire harness Poletop plate

Crossarm plate

Poletop

Provided

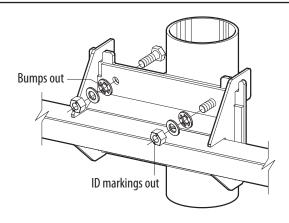
hardware (4 holes)



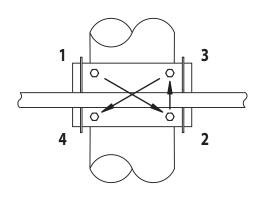
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Bolt-on Crossarms

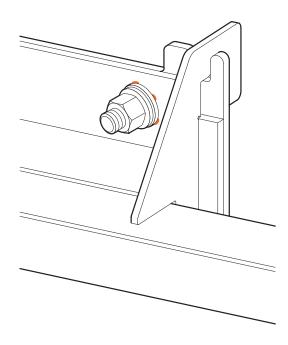
Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



Snug all nuts. Using supplied 11/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



- Using supplied breaker bar, 11/16 in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.
- Repeat steps 1–5 for remaining crossarms.
- Do not reuse structural fasteners. Discard if removed or loosened after tightening.



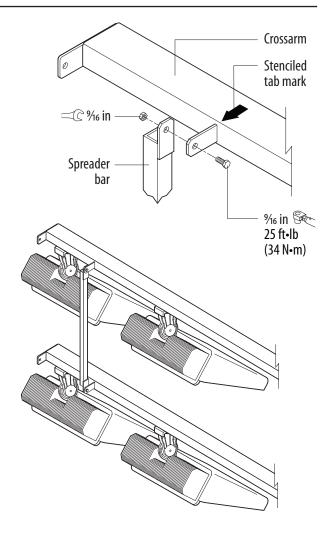


Bolt-on Crossarms

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.

Install spreader bars with ¾ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30% in (775 mm) and 60 in (1524 mm). Always install longer bars to upper three crossarms.





Wire Harness

Overview

Too	le/	KΛ	ato	ria	lc	N	99	d	he
100	15/	IVI	ale	Па	15	IV	ee	u	=(0)

Musco Supplied

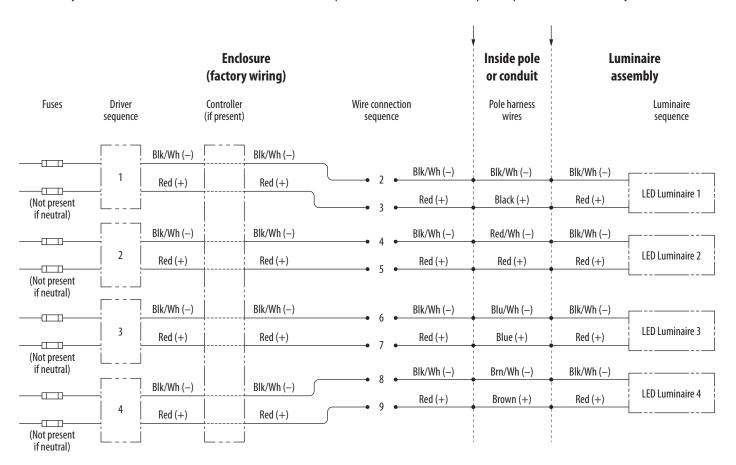
☐ % in wrench

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

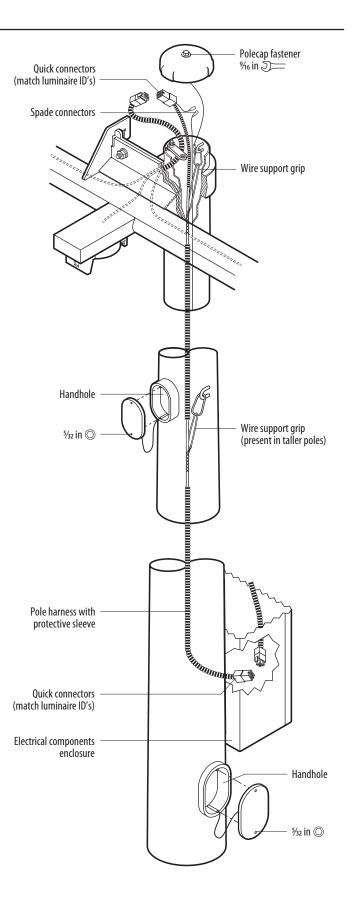


Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

- **1** R
- Remove handhole covers using $\frac{1}{2}$ in hex key. Remove polecap using $\frac{1}{6}$ in wrench.
- 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.
- Attach support grips at midpole (if present).
- 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.
- Replace handhole covers and polecap.





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

- ☐ ¾ in hex key (ground bar)
- 5/16 in hex key (bonding terminal inside handhole)
- **3** 5 mm hex key (125 A disconnect terminals)
- Equipment bonding jumper

Contractor Supplied

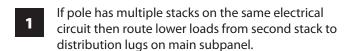
- Standard screwdriver
- ☐ 3 m (10 ft) stepladder or small line truck

Installation Procedure



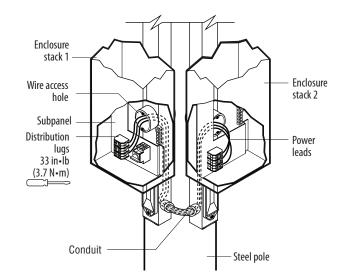
Musco Control System Summary or Field Aiming Diagram provides electrical loading information needed to size wire and switchgear.

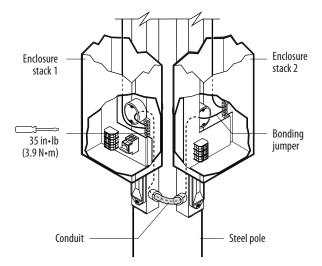
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.



Route all power leads for lighting equipment to appropriate subpanel locations.

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

- Remove handhole cover using 5/32 in hex key. Rout supply wiring through access hub into electrical components enclosure.
- 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.
- 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.
- Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 1/16 in hex key.
- 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.

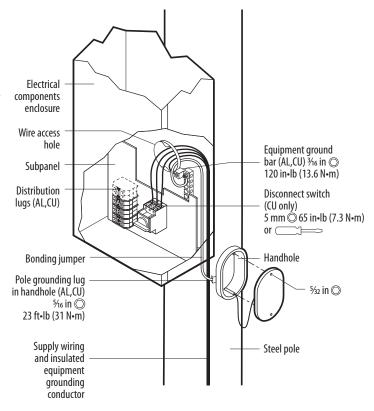
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

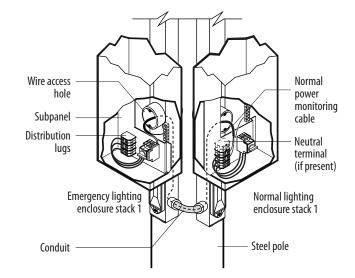


Warning Lightning hazard.

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.
- 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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TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Notes



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

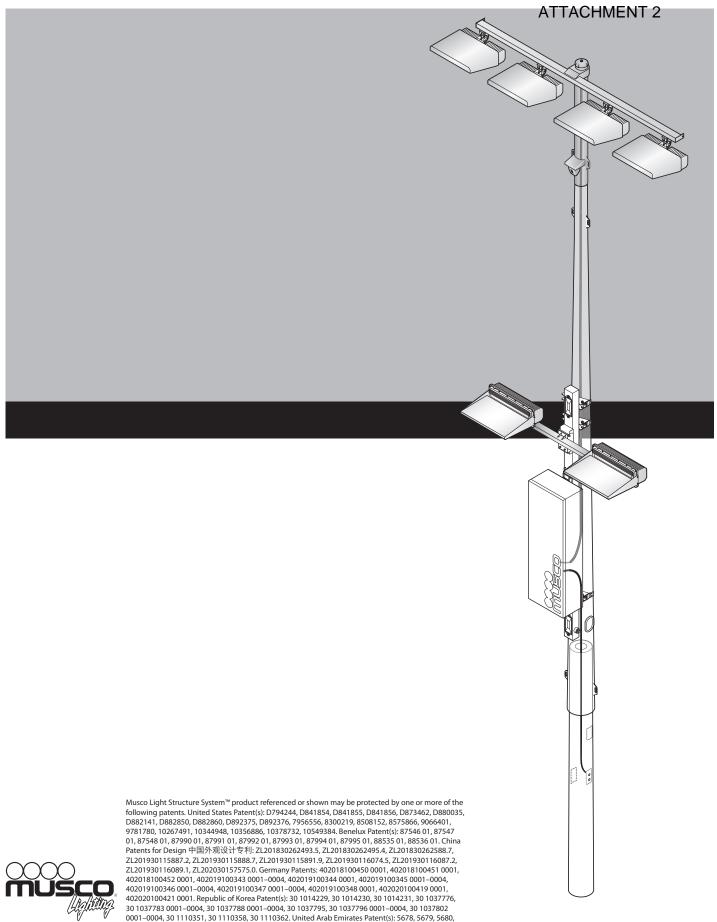
ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Notes



TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX



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



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pending. [Pat_085A]

ATTACHMENT 2

Jack Hammett Sports Complex LED Retorfit Costa Mesa, CA

Lighting System

Pole/Fixture S	ummary					
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
A1, C1	80'	80'	3	TLC-LED-1500	4.23 kW	Α
A2, C2	80'	80'	2	TLC-LED-1500	2.82 kW	Α
A2, C2	80'	80'	2	TLC-LED-900	1.76 kW	Α
A3, C2	80'	80'	2	TLC-LED-1500	2.82 kW	В
A3, C2	80'	80'	2	TLC-LED-900	1.76 kW	В
A4, C1	80'	80'	3	TLC-LED-1500	4.23 kW	В
B1, D1	80'	80'	4	TLC-LED-1500	5.64 kW	Α
B2, D1	80'	80'	4	TLC-LED-1500	5.64 kW	В
S1, S3	80'	80'	2	TLC-LED-1200	2.34 kW	С
S1, S3	80'	80'	2	TLC-LED-900	1.76 kW	С
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 Sumn	nary		
Circuit	Description	Load	Fixture Qty
Α	Soccer 1	28.90 kW	22
В	Soccer 2	28.90 kW	22
С	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												
Туре	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	Line Amperage Per Luminaire									
(.90 min power factor)	(max draw)									
Single Phase Voltage	208	220	240	277	347	380	480			
Single Filase Voltage	(60)	(60)	(60)	(60)	(60)	(60)	(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		I	llumination			Circuits	Fixture Qty			
Grid Name	Calculation Metric	Ave	Min	Max	Max/Min	Ave/Min	Circuits	Fixture Qty			
Soccer 1	Horizontal Illuminance	32.8	26	42	1.63	1.26	Α	22			
Soccer 2	Horizontal Illuminance	32.8	26	45	1.76	1.26	В	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







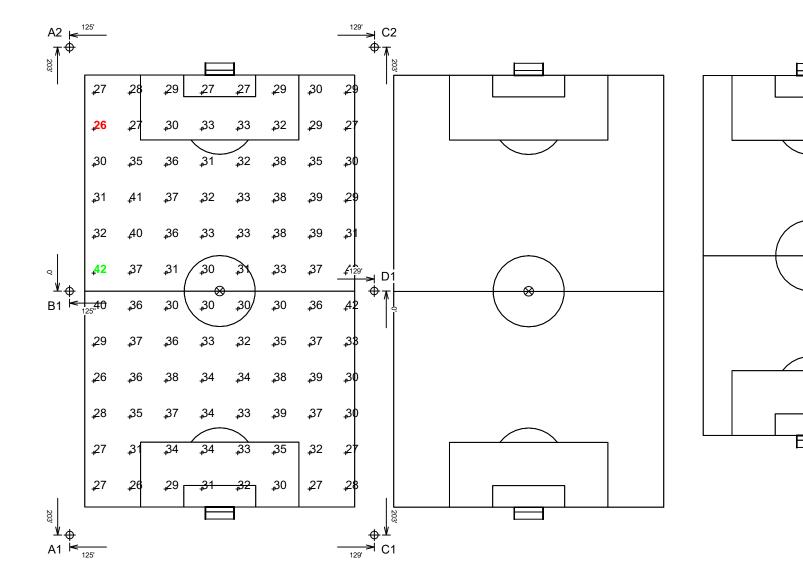




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Equi	Equipment List For Areas Shown											
	Pole	;			Luminaires							
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS				
1	A1	80'	-	80'	TLC-LED-1500	3	3	0				
1	A2	80'	-	80'	TLC-LED-1500	2	2	0				
				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



ATTACHMENT 2
Jack Hammett Sports Complex LED Retorfit

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	32.8							
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.

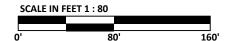
Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

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.



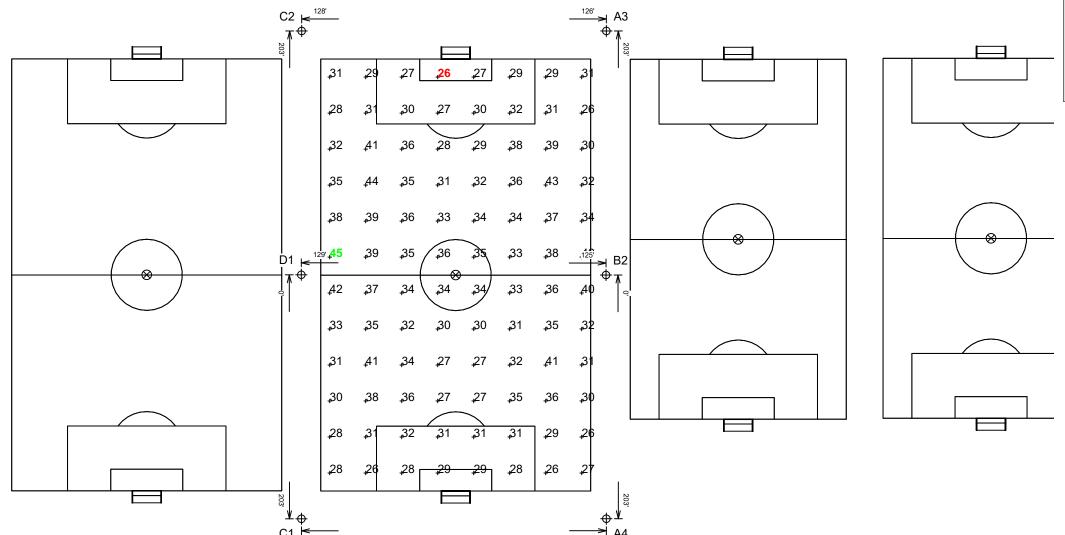
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Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

Equi	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



ATTACHMENT 2
Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

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

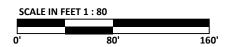
Illumination Summary								
	MAINTAINED HORIZONTAL FOOTCANDLES							
	Entire Grid							
Guaranteed Average	30							
Scan Average	32.8							
Maximum	45							
Minimum	26							
Avg/Min	1.28							
Guaranteed Max/Min	2.5							
Max/Min	1.76							
UG (adjacent pts)	1.36							
CU	0.76							
No. of Points	96							
LUMINAIRE INFORMATION								
Applied Circuits	В							
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.



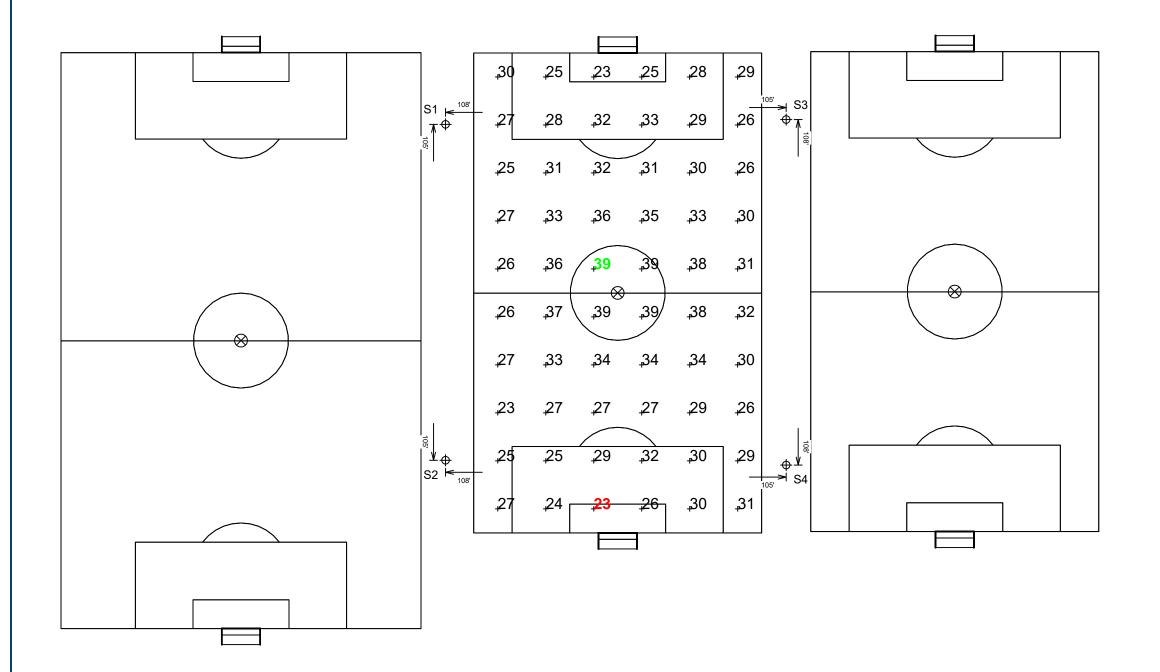
Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes



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Equi	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

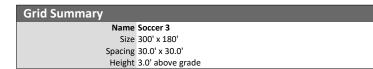


SCALE IN FEET 1 : 60

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

ATTACHMENT 2 Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA



Illumination Summa	ry
	MAINTAINED HORIZONTAL FOOTCANDLE
	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.

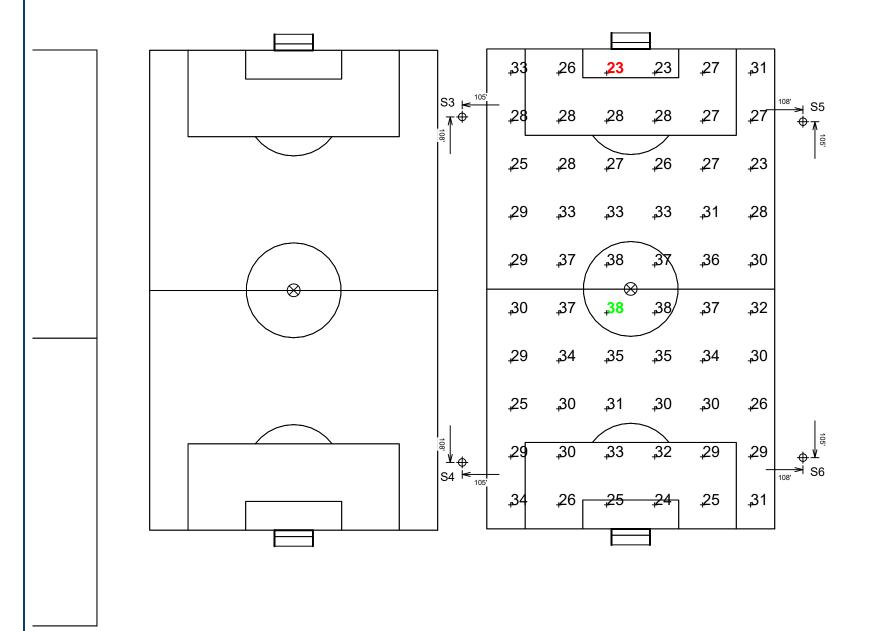
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

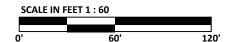


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Equi	Equipment List For Areas Shown										
	Pole	9			Luminaires						
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY/POLE	THIS GRID	OTHER GRIDS			
2	S3-S4	80'	-	80'	TLC-LED-1200	2/2*	2	2			
				80'	TLC-LED-900	2/2*	2	2			
2	S5-S6	80'	-	80'	TLC-LED-1200	2	2	0			
				80'	TLC-LED-900	2	2	0			
4		Totals					16	8			

^{*}This structure utilizes a back-to-back mounting configuration





Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

ATTACHMENT 2 Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

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

Illumination Summa	ry
	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.



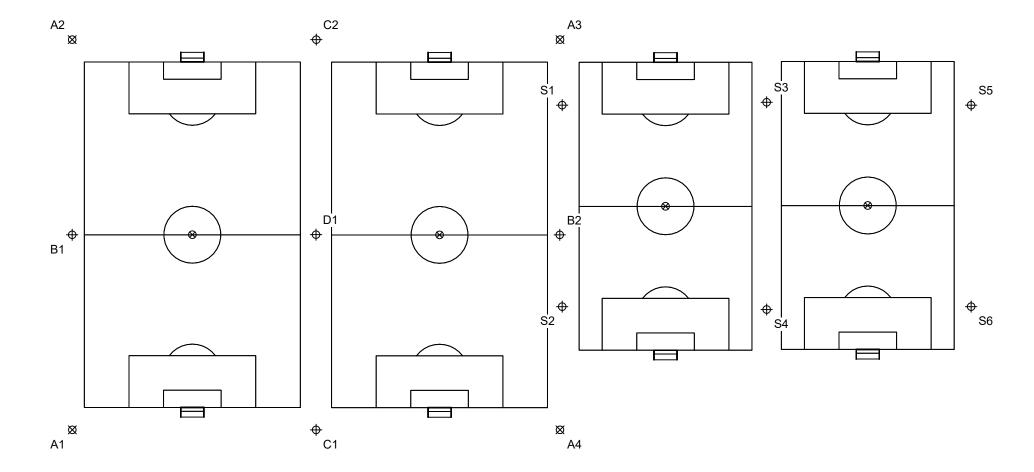
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TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

Equ	Equipment List For Areas Shown									
	Pole	:			Luminaires					
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	I IIIMINAIRE IVPE IOI		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'	80' TLC-LED-900		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'	80' TLC-LED-1500		4	0		
				80'	80' TLC-LED-900		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'	80' TLC-LED-900		4	0		
15		Totals					76	0		

^{*}This structure utilizes a back-to-back mounting configuration

D.00 D.00 D.01 D.03 D.13 D.11 D.10 D.10 D.12 D.14 D.15 D.03 D.19 D.18 D.17 D.16 D.17 D.19 D.20 D.12 D.01 D.02 D.05 D.05 D.05 D.03 D.03 D.04 D.04 D.05 D.07 D.06 D.04 D.02 D.01 D.00 D.00 D.00



Pole location(s) \bigoplus dimensions are relative to 0,0 reference point(s) \bigotimes

ATTACHMENT 2 Jack Hammett Sports Complex LED Retorfit

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	0.039					
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					

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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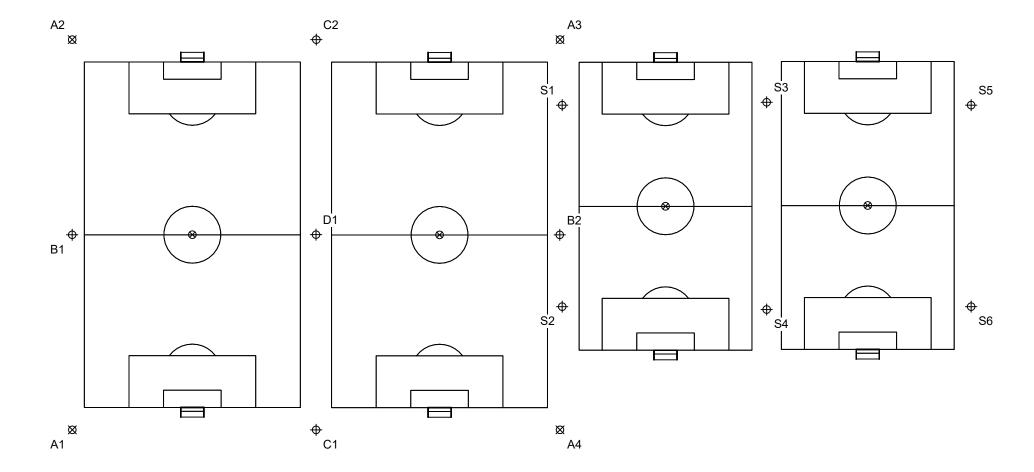
SCALE IN FEET 1:100

TECHNICAL PROVISIONS FOR JACK HAMMETT SPORTS COMPLEX

Equipment List For Areas Shown											
	Pole	:			Luminaires						
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	I IIIMINAIRE IVPE IOI		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'	80' TLC-LED-900			0			
2	B1-B2	80'	-	80'	80' TLC-LED-1500		4	0			
1	C1	80'	-	80'	TLC-LED-1500	6	6	0			
1	C2	80'	-	80'	80' TLC-LED-1500		4	0			
				80'	80' TLC-LED-900		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'	80' TLC-LED-900		4	0			
15				Totals 76 76							

^{*}This structure utilizes a back-to-back mounting configuration

D.00 D.01 D.01 D.02 D.05 D.18 D.15 D.12 D.13 D.18 D.21 D.23 D.06 D.26 D.24 D.24 D.20 D.21 D.25 D.27 D.17 D.03 D.05 D.09 D.12 D.11 D.08 D.06 D.08 D.09 D.11 D.12 D.11 D.09 D.06 D.02 D.01 D.00 D.00 D.00



Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

ATTACHMENT 2
Jack Hammett Sports Complex LED Retorfit

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	0.059					
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					

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

ATTACHMENT 2 Jack Hammett Sports Complex LED Retorfit

Costa Mesa, CA

Equipment Layout

INCLUDES: · Soccer 1 · Soccer 2 · Soccer 3 · Soccer 4

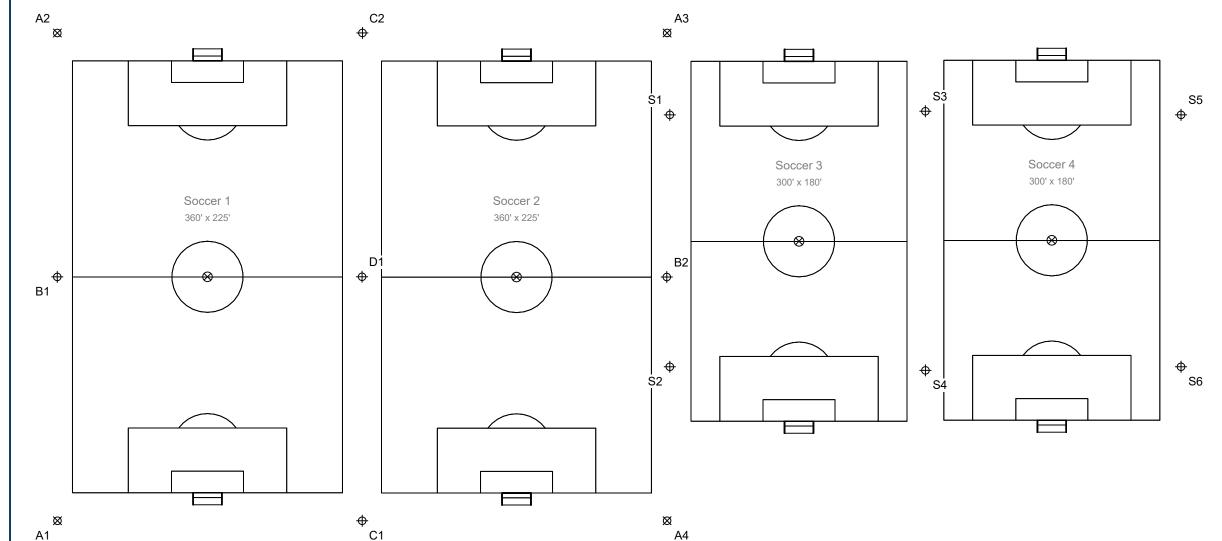
Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

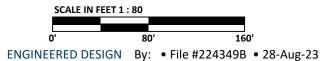
Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

Equ	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'	80' TLC-LED-900					
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)						
	208	220	240	277	347	380	480
Single Phase Voltage	(60)	(60)	(60)	(60)	(60)	(60)	(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





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 ID:

Control-Link Control and Monitoring Control System Type:

Communication Type:

Power Requirements

Control cabinet(s):

Control voltage (phase to neutral VA loading - Inrush VA loading - Sealed

Lighting Circuits:

Voltage/Hertz/Phase

Project Notes:

	Equipment Listing				
120/60	Description	Qty	Size (in)		
	Control and monitoring cabinet - primary	1	24 X 72		
480/60/3	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.



ATTAQUIACNIT

System Requirements: Control System Summary

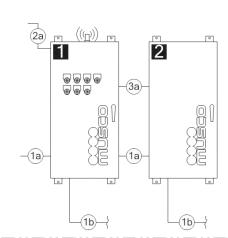
Project Name: Jack Hammett Sports Complex LED Retrofit | Project #: 224349 Control System ID: 1 of 1

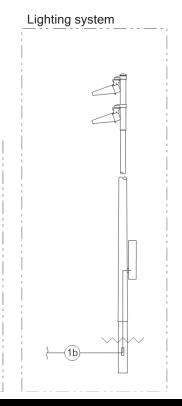
Distribution Panel Location/ID: Soccer

Equipment Layout and Connection Details



Control cabinet location





	me	2 77	210	Jeta	ПС
-			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		111

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

- Control and monitoring cabinet primary
- 2 Control and monitoring cabinet secondary



A --- A --- IR A -- K ---

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	Full load	Contactor	Cabinet #	Contactor
			Fixtures	amperes	Size (Amps)		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	А3	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

Sales Representative: Karin Anderson | Project Engineer: Daniel Lohman | Scan: 224349B | Document ID: 224349P1V1-0828104024



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



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.
 - 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'

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- 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.

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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.

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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS AFTACEMENT 2

- 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.
- 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

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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS AFTACEMENT 2

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:
 - 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

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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS AFTACEMENT 2

- 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.

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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS ATTACEMENT 2

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.
	В	Equipment Layout	Drawing(s) showing field layouts with pole locations
	С	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.
	н	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.
	К	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.

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TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS ATNACEMENT 2

N	Non-	Manufacturer shall list all items that do not comply with the specifications. If in full compliance,
IN	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:

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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.



TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER

ATTACHMENT 2

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.



TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER

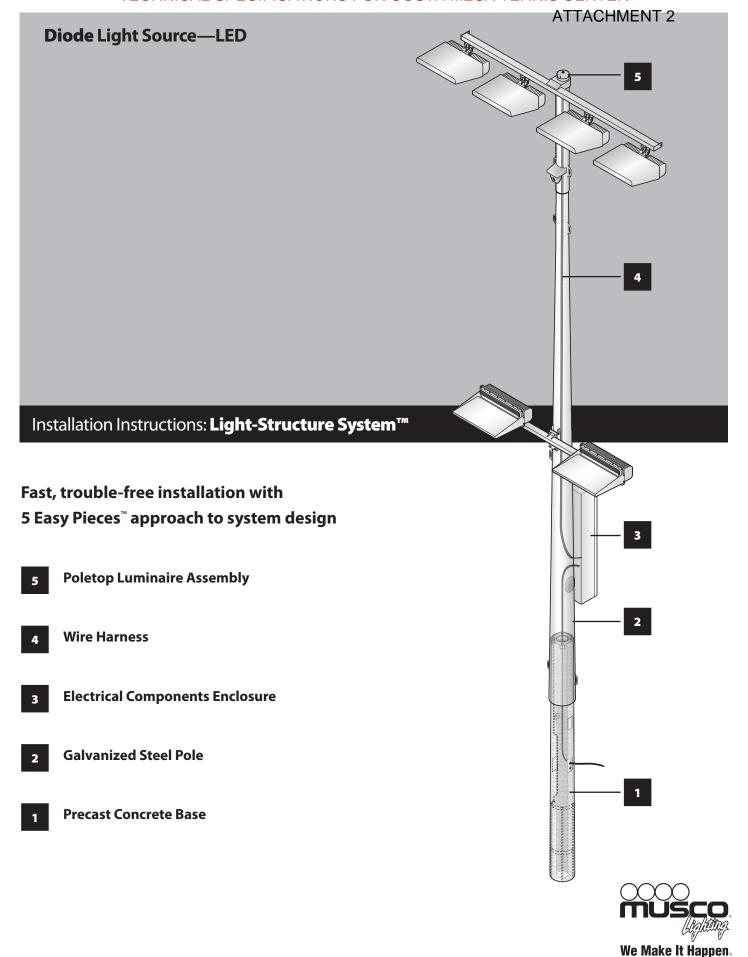


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Before You Begin

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.



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.



ATTACHMENT 2

Installation Instructions: Light-Structure System™

Before You Begin

Standard Tools/Supplies Checklist

Refer to supplemental instructions provided for additional tools required.

idiiddid ioois/sappiics ciicciii.	additional tools required.	
ontractor/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 %, % and % 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
lusco 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
11/16 in socket, extension, breaker bar, and 11/16 in wrench	Tightening structural fasteners	16
5⁄₃₂ in hex key	Attaching handhole covers on base and steel pole	10, 22, 23,
% 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
1/16 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
% in hex key	Attaching grounding conductors inside electrical enclosure	33, 34
% in hex key	Attaching grounding conductors inside pole at handhole	34, 35
achinery 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.



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.

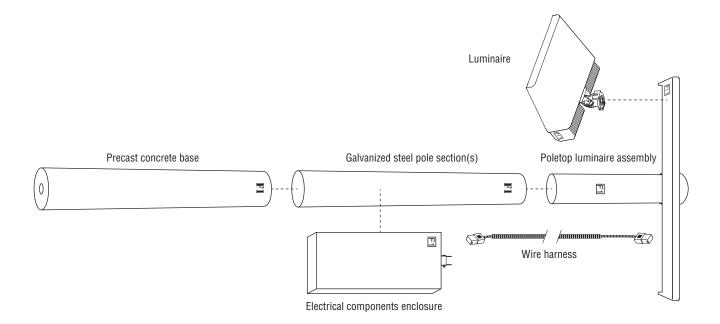


Before You Begin

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



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

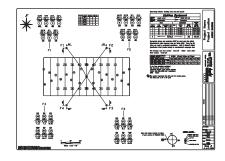
This drawing provides information related to the installation of the foundation and the galvanized steel pole.

- Pole weight
- Precast concrete base weight
- · Hole depth and diameter
- Concrete backfill quantities
- Pole section minimum overlaps

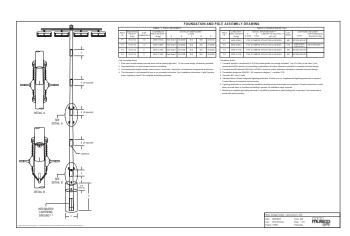
Note: Foundation details are omitted on projects with alternate foundation design.

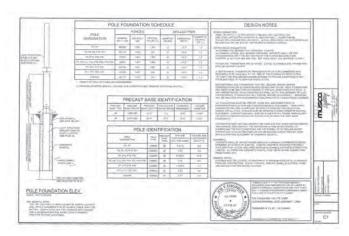
Alternate Foundation Design

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.











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.



Mark pole locations per Field Aiming Diagram.

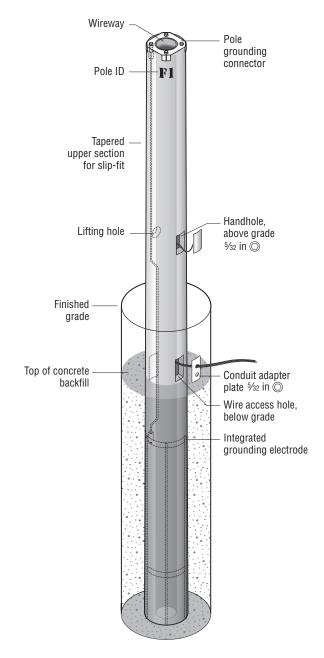


Excavate holes to size and depth given on Musco Foundation and Pole Assembly Drawing or alternate foundation design.



Warning Fall hazard

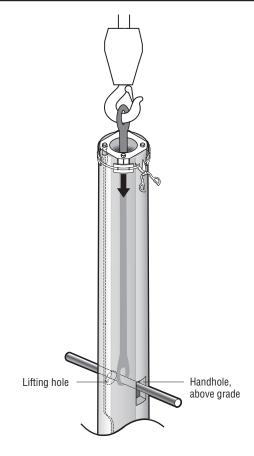
Cover holes or install fencing for fall safety.



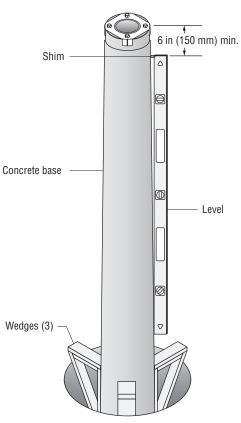


Precast Concrete Base

Sling and lower base into hole. Orient wire access hole to accommodate incoming supply wiring. Snip banding and remove tab protectors.



- 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.
- 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.
- Backfill with concrete per Musco Foundation and Pole Assembly Drawing or alternate foundation design.

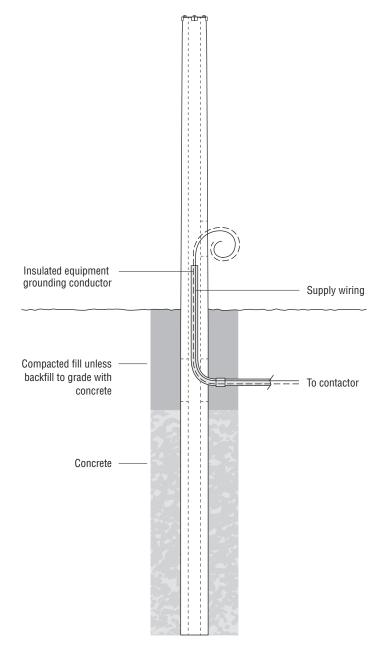




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Precast Concrete Base

- 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.
- Backfill with compacted soil to finished grade unless alternate foundation design requires concrete to finished grade.





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.

☐ Two 1½ ton chain come-alongs

Contractor Supplied

Tools/Materials Needed

Musco Supplied

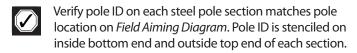
■ Wooden shipping blocks

Musco Foundation and Pole Assembly Drawing

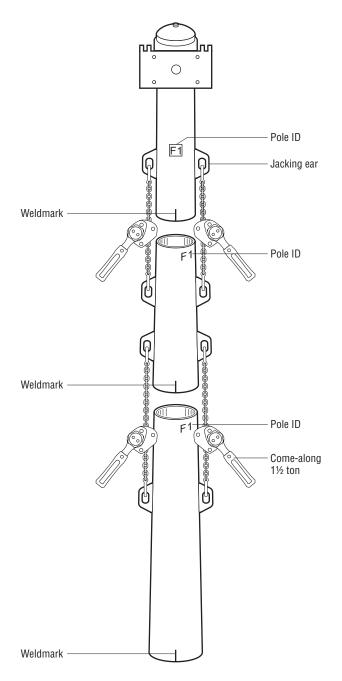
☐ % in wrench

Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)

Assembly Procedure



- 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.
- Lubricate top of each steel pole section with supplied dishwashing liquid.
- 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.

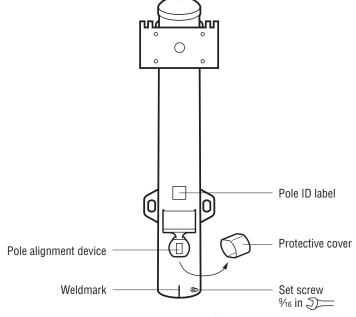




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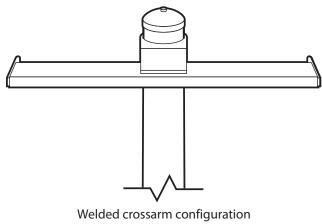
Galvanized Steel Pole and Poletop Luminaire Assembly

- Tighten set screw using % in wrench.
- 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.



(reference)

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 11/16 in socket
- ☐ ¾ in drive breaker bar
- ☐ ¾ in drive 4 in extension
- ☐ 1½ in wrench
- Spreader bars
- → ¾ in fasteners (for spreader bars)
- 5% in structural fasteners
- ☐ % in wrench

Contractor Supplied:

☐ Torque wrench with ¾6 and ¾6 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.



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.

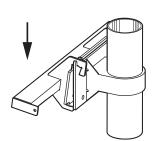
Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2

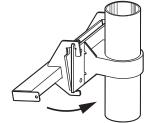
Position crossarm as shown below.



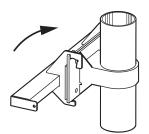
Ensure crossarm wire harness is not pinched between mating plates.











Crossarm

Crossarm wire harness Poletop plate

Crossarm

Poletop

Provided

hardware (4 holes)

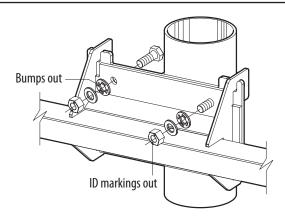
plate



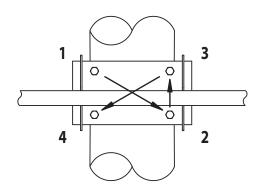
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Bolt-on Crossarms

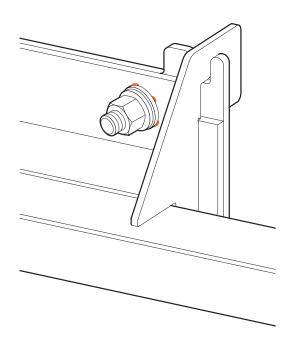
Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



Snug all nuts. Using supplied 11/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



Using supplied breaker bar, 11/16 in socket, extension, and wrench, tighten each nut until orange extrusion appears from at least three bumps.



Bolt-on Crossarms

6

Repeat steps 1–5 for remaining crossarms.

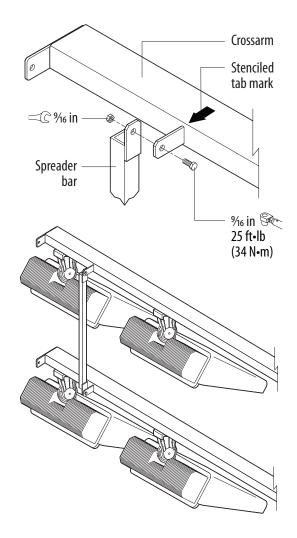


Do not reuse structural fasteners. Discard if removed or loosened after tightening.

- 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.
- Install spreader bars with ¾ in fasteners at the locations marked on each crossarm. Torque to 25 ft•lb (34 N•m).

Spreader bars may come in two sizes, 30% 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.





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

- ☐ % in wrench

Contractor Supplied

- Phillips-head screwdriver
- Standard screwdriver

Assembly Procedure



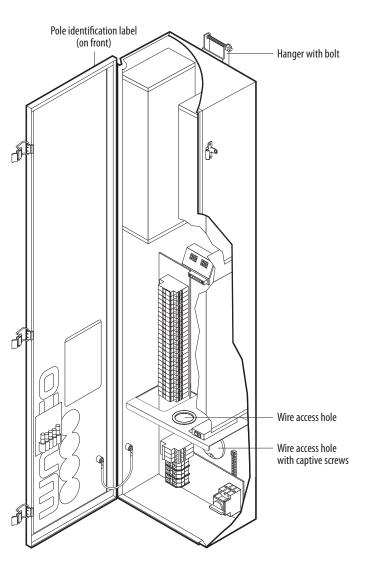
Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.



Caution

Electrical components enclosures are heavy.

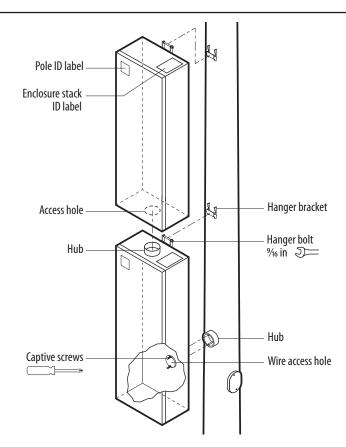
Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.





Electrical Components Enclosure

- Mount bottom enclosure on pole. Align wire access hole with hub. Tighten captive screws using Phillips-head screwdriver. Tighten hanger bolt with % in wrench.
- Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with % 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*.

- Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.
- Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.
- Repeat steps 1 4 for each stack.



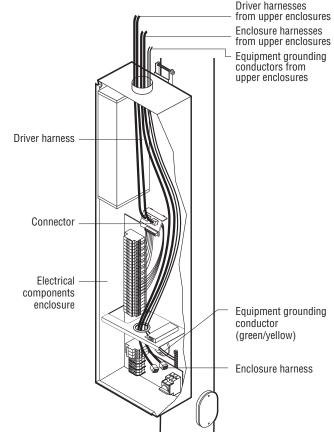
Warning

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.





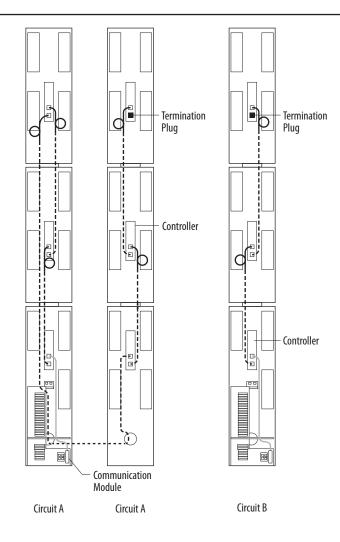
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Electrical Components Enclosure

Note: Skip steps 6–7 if controller not present.



Pull communication cables down from top and middle boxes and plug into controller in enclosure below as shown

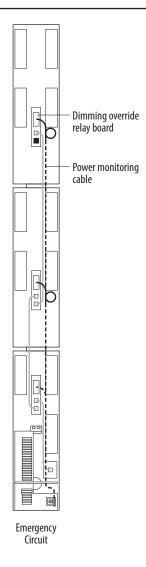


Electrical Components Enclosure

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.

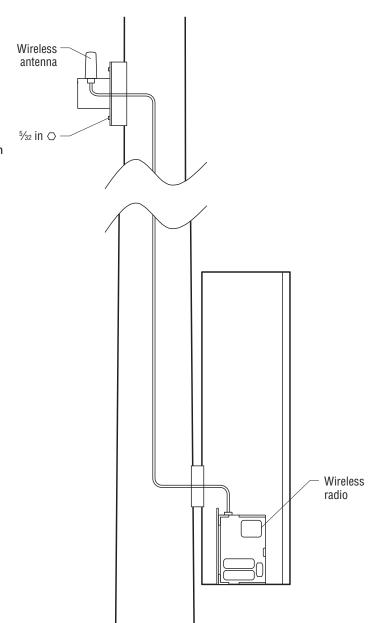




Electrical Components Enclosure

Note: Skip steps 8-9 if wireless antenna not present.

- 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.
- Install the coaxial cable on the wireless radio located in the electrical components enclosure.





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

☐ % in wrench

Contractor Supplied

Fish tape

Electrician's tape

Assembly Procedure



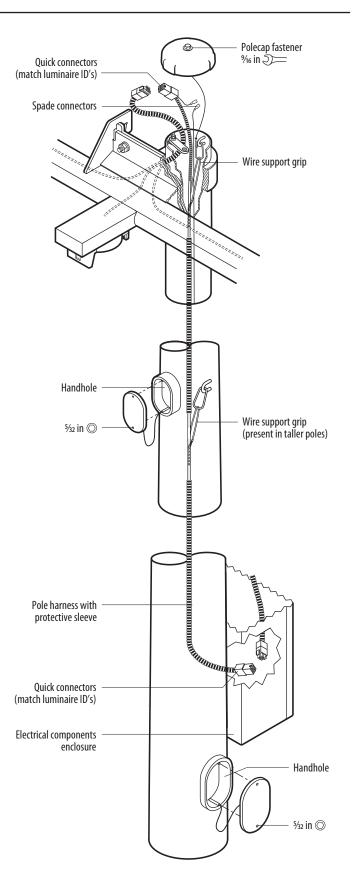
Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

- Remove handhole covers using 5/32 in hex key. Remove polecap using 1/36 in wrench.
- 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.
- Attach support grips at poletop and midpole (if present).
- 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.





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

☐ 1/16 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

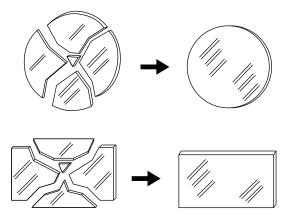
No User Serviceable Parts

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*.



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.

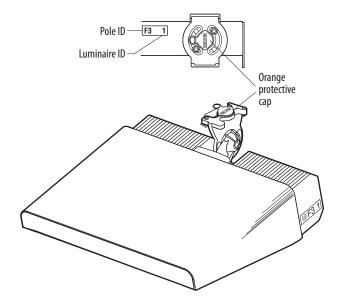


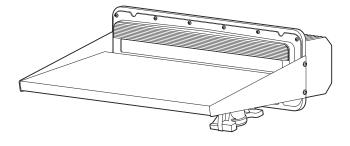
Caution - Equipment Damage

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*.







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.

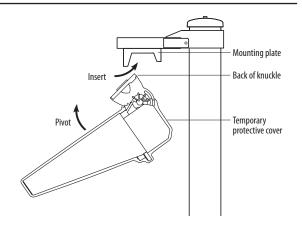
Note: The luminaire style may vary from what is shown.

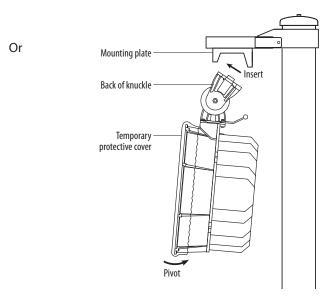
Luminaire	Weight
TLC-LED-350	25 lb (11 kg)
TLC-LED-400	40 lb (18 kg)
TLC-LED-550	25 lb (11 kg)
TLC-LED-550NR	38 lb (17 kg)
TLC-BT-575	34 lb (15 kg)
TLC-LED-600	40 lb (18 kg)
TLC-LED-900	40 lb (18 kg)
TLC-LED-900NB	114 lb (52 kg)
TLC-LED-1150	80 lb (36 kg)
TLC-LED-1200	45 lb (20 kg)
TLC-LED-1400NB	106 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)

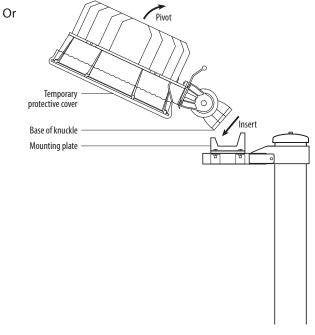


Caution

Luminaire may be heavy. Lift carefully with two people to avoid injury.

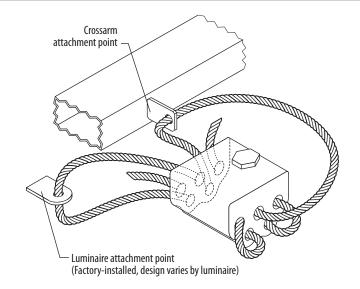






Luminaire Attachment

- 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.
- Using % in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m)



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 \(\frac{7}{16} \) 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.



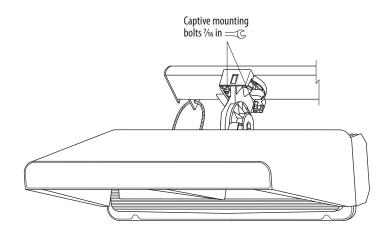
Caution - Equipment Damage

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.



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



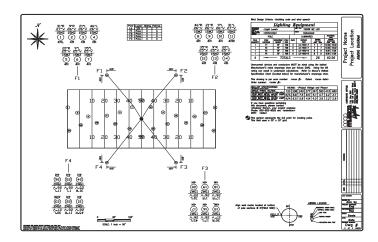
Verify pole ID matches precast concrete base and pole location on *Field Aiming Diagram*.



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.



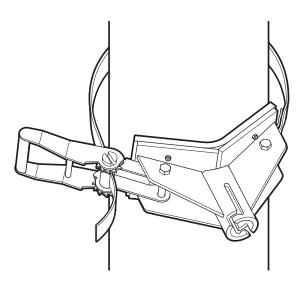
Attach pole rotator clamp approximately 12 in (300 mm) above bottom of pole. Wrap strap around pole and cinch tightly.



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).





Pole Setting and Alignment



Remove temporary protective cover from luminaires (if present). Do not use knife.

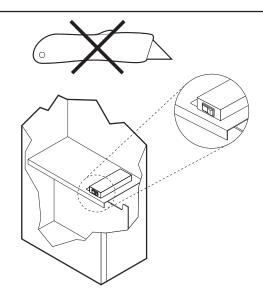


Warning Laser radiation hazard

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.

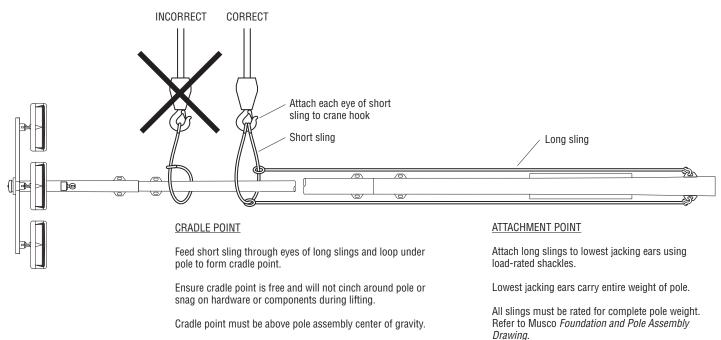
Follow these instructions carefully. Do not choke pole or lift from crossarms.

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





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.

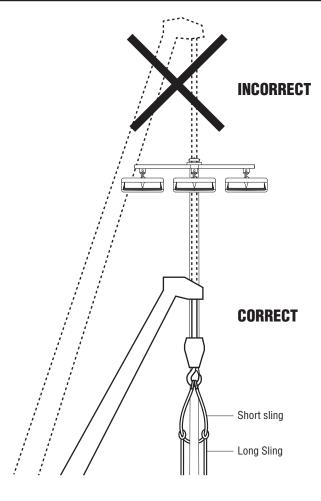


Lift pole. Use care to avoid dragging bottom of pole. Keep crane head below crossarms.



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.



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.





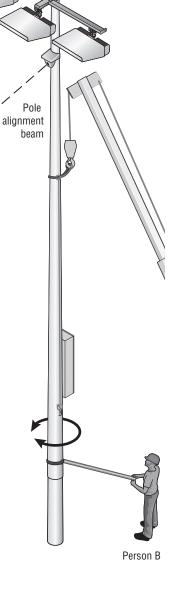
Pole Setting and Alignment



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.





Person A



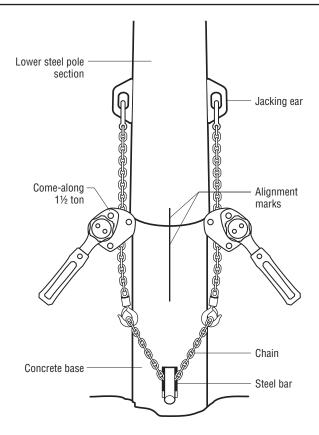
Warning Laser radiation hazard

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.



Pole Setting and Alignment

- 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).
- Lower pole into position. Hold pole rotator bar to maintain alignment until pole seats on base. Remove rotator bar and clamp.
- 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.



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

- ☐ ¾6 in hex key (ground bar)
- ☐ 5/6 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



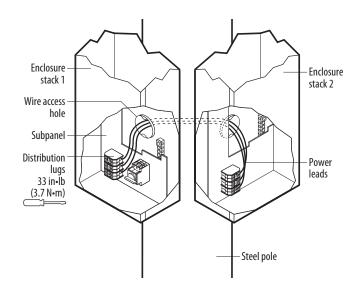
Musco Control System Summary or Field Aiming Diagram provides electrical loading information needed to size wire and switchgear.

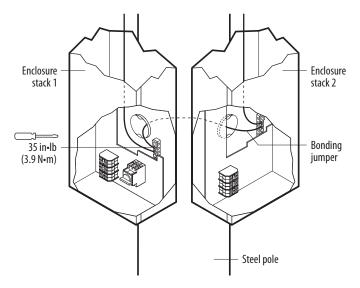
Musco provides instructions for installing Control-Link $^{\text{m}}$ control system or lighting contactor cabinet when these items are part of your project.

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.

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 3/6 in hex key.



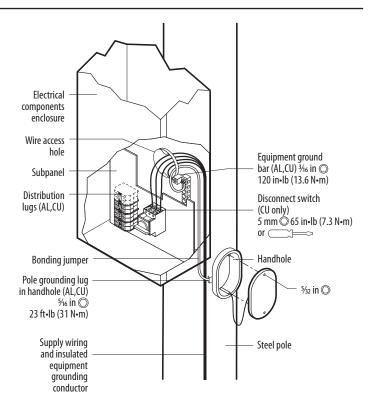




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Connecting to Supply Wiring

- Remove handhole cover using 5/32 in hex key. Rout supply wiring through access hub into electrical components enclosure.
- Connect insulated equipment grounding conductor (supply) to ground bar. Tighten lug using 3/6 in hex key.
- Disconnect is rated for copper wire only. Contact Musco for adaptor or use UL Listed adaptor for aluminum supply wire.
- 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
	L	12-3 AWG (4-25 mm ²)*	0.63 in (16 mm)	25 in•lb (2.8 N•m)
45 A	N	16-4 AWG (1.5-25 mm ²)*	0.56 in (14 mm)	27 in•lb (3.1 N•m)
	G	14-2/0 AWG (2.5-50 mm ²)**	NA	120 in•lb (13.6 N•m)
	L	10-2 AWG (6-35 mm ²)*	0.63 in (16 mm)	50 in•lb (5.6 N•m)
125 A		1 – 2/0 AWG (40 – 50 mm ²)*	0.63 in (16 mm)	65 in•lb (7.3 N•m)
12571	N	16-1/0 AWG (1.5-50 mm ²)*	0.71 in (18 mm)	33 in•lb (3.7 N•m)
	G	14-2/0 AWG (2.5-50 mm ²)**	NA	120 in•lb (13.6 N•m)

^{*}Stranded cable, single conductor, copper only



^{**}Stranded cable, single conductor, copper or aluminum

Connecting to Supply Wiring

- Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 5% in hex key.
- 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.

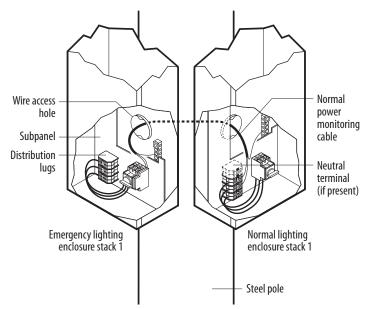


Warning Lightning hazard.

For poles located near metal fences, metal bleachers, or other metal structures, bond structures to pole ground to maintain equal electrical potential.

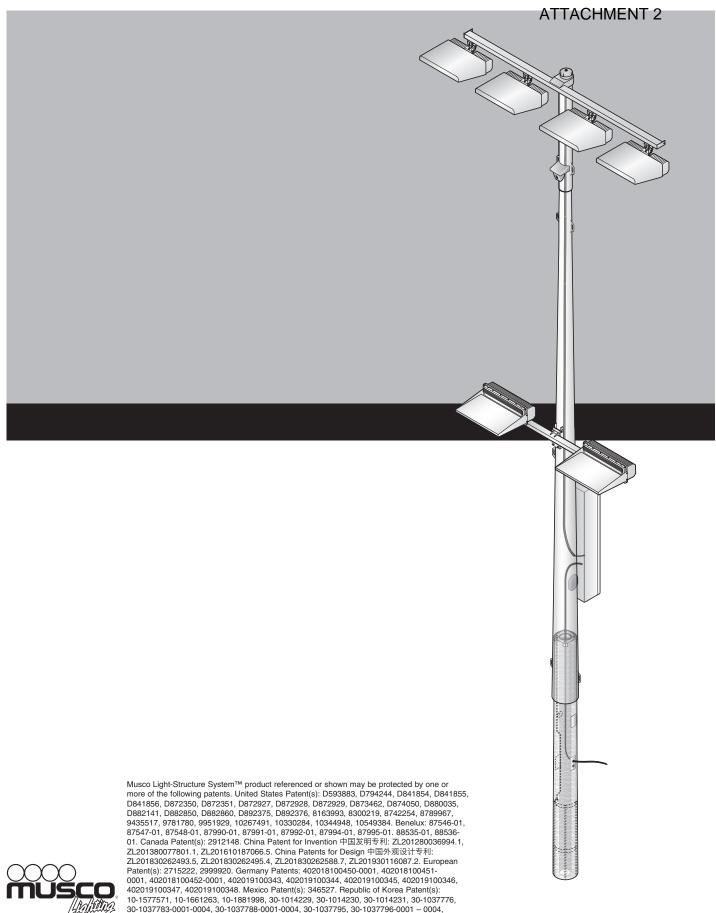
Note: Skip step 8 if no emergency egress lighting is present.

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.





TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER



30-1037802-0001 - 0004. Russia Patent: 2616559. United Kingdom Patent(s): 6032011, 6032022, 6032023, 6056943, 6056944, 6056945, 6056946, 6056947, 6056948. U.S. and foreign



WWW.musco.com patents pending. [Pat_057R]

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	Α		
T2	50'	50'	2	TLC-LED-550	1.08 kW	Α		
		50'	2	TLC-LED-550	1.08 kW	В		
Т3	50'	50'	2	TLC-LED-550	1.08 kW	В		
		50'	2	TLC-LED-550	1.08 kW	С		
T4	50'	50'	2	TLC-LED-550	1.08 kW	С		
T5	50'	50'	2	TLC-LED-550	1.08 kW	С		
		50'	2	TLC-LED-550	1.08 kW	D		
T6	50'	50'	2	TLC-LED-550	1.08 kW	С		
		50'	2	TLC-LED-550	1.08 kW	В		
		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	В		
		50'	2	TLC-LED-550	1.08 kW	А		
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	Е		
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	Е		
T13	50'	50'	2	TLC-LED-550	1.08 kW	F		
		50'	2	TLC-LED-900	1.78 kW	Е		
14			48		26.62 kW			

Circuit Summary							
Circuit	Description	Load	Fixture Qty				
Α	Tennis 1-2	4.32 kW	8				
В	Tennis 3-4	4.32 kW	8				
С	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							
Туре	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)	Ma	ax Line	e Amp	erage	Per Lu	ıminai	re
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 Summa	ry							
Grid Name	Calculation Metric			Illumination			Circuits	Fixture Qty
Criu Hairie	Calculation Metric	Ave	Min	Max	Max/Min	Ave/Min	Oncuita	Tixture Qty
Tennis 1-2	Horizontal Illuminance	32.4	23	39	1.65	1.41	Α	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	В	8
Tennis 5-6	Horizontal Illuminance	33	24	44	1.87	1.37	С	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	Е	8

From Hometown to Professional











EQI	EQUIPMENT LIST FOR AREAS SHOWN									
	P	ole			Luminaires					
OTY	LOCATION	SIZE	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER		
Q I I	LOGATION	SILL	SILL	SILL	ELEVATION	HEIGHT	TYPE	POLE	GRID	GRIDS
2	T1, T8	50'	-	50'	TLC-LED-550	2	2	0		
2	T2, T7	50'	-	50'	TLC-LED-550	4	2	2		
1			12	Q	1					



Tewinkle Park Termis 2

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 Guaranteed Average: Scan Average: 32.35 Maximum: Minimum: 23 Avg / Min: 1.38 Guaranteed Max / Min: 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.



EQI	EQUIPMENT LIST FOR AREAS SHOWN									
	P	ole			Luminaires					
OTY	LOCATION	SIZE	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER		
9	LOGATION	JIEL	ELEVATION	HEIGHT	TYPE	POLE	GRID	GRIDS		
3	T2-T3, T7	50'	-	50'	TLC-LED-550	4	2	2		
1	T6	50'	-	50'	TLC-LED-550	4/4*	2	6		
1			20	Q	12					

^{*} This structure utilizes a back-to-back mounting configuration



Pole location(s) \bigoplus dimensions are relative to 0,0 reference point(s) \bigotimes

Tewinkle Park Terril PENT 2

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 S	ILLUMINATION SUMMARY					
MAINTAINED HORIZONTA	AL 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 INFORMATIO	N					
Applied Circuits:	В					
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.



EQI	EQUIPMENT LIST FOR AREAS SHOWN									
Pole Luminaires										
OTY	LOCATION	SIZE	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER		
QII	LOCATION	SIZE	ELEVATION	HEIGHT	TYPE	POLE	GRID	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			18	8	10					

^{*} This structure utilizes a back-to-back mounting configuration



Tewinkle Park Termin 2

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 S	ILLUMINATION SUMMARY				
MAINTAINED HORIZONTA	AL 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 INFORMATIO	N .				
Applied Circuits:	С				
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.



EQUIPMENT LIST FOR AREAS SHOWN									
	P	ole			Luminaires				
OTY	LOCATION	SIZE	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER	
QII	LOCATION	JILL	ELEVATION	HEIGHT	TYPE	POLE	GRID	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



Tewinkle Park TermiNENT 2

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 S	ILLUMINATION SUMMARY				
MAINTAINED HORIZONTA	AL 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 INFORMATIO	N .				
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.



EQI	EQUIPMENT LIST FOR AREAS SHOWN										
	P	ole			Luminaires						
OTY	LOCATION	SIZE	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER			
QII	LUCATION	LUCATION SIZE	ELEVATION	HEIGHT	TYPE	POLE	GRID	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			
1	TOTALS 20 9 12										

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



Pole location(s) \bigoplus dimensions are relative to 0,0 reference point(s) \bigotimes

Tewinkle Park Termi MENT 2

Costa Mesa,CA

GRID SUMMARY

Name:
Size:
Spacing:
Spacing:
Height:
3.0' above grade

ILLUMINATION S	LLUMINATION SUMMARY				
MAINTAINED HORIZONTA	L FOOTCANI	DLES			
	Entire Gri	d			
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.

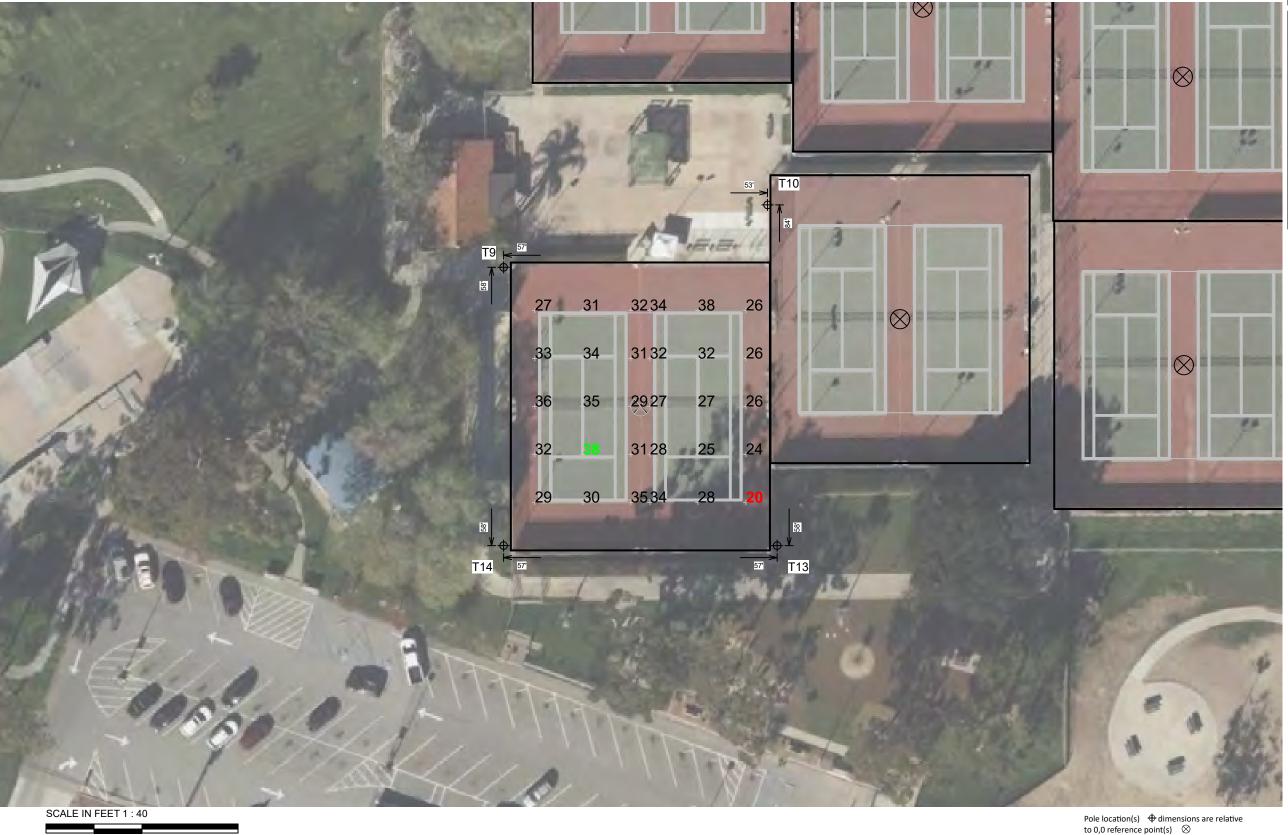
Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

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.



EQI	EQUIPMENT LIST FOR AREAS SHOWN									
	P	ole		Luminaires						
OTY	LOCATION	SI7F	GRADE	MOUNTING	LUMINAIRE	QTY /	THIS	OTHER		
QII	LUCATION	SIZE	ELEVATION	HEIGHT	TYPE	POLE	GRID	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						8	4		



Tewinkle Park Temnis 2

Costa Mesa,CA

Rame: Size: 2 Court - 12' Spacing 20.0' x 20.0' x 3.0' above grade

ILLUMINATION SUMMARY Guaranteed Average: Scan Average: 30.35 Maximum: Minimum: 20 Avg / Min: 1.48 Guaranteed Max / Min: 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.

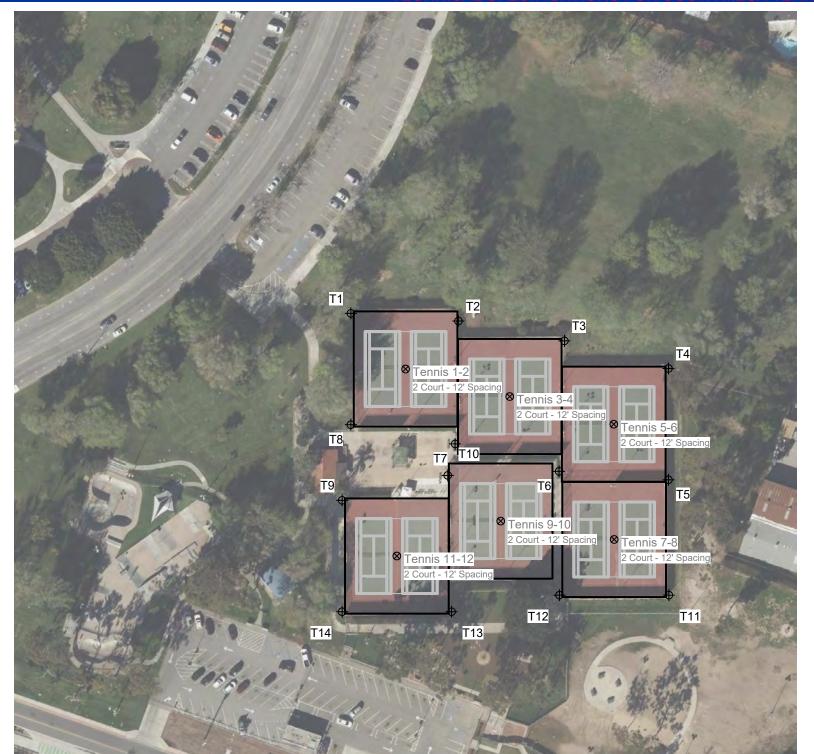
Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

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.



TECHNICAL SPECIFICATIONS FOR COSTA MESA TENNIS CENTER



Tewinkle Park TermiNENT 2

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.

EQ	EQUIPMENT LIST FOR AREAS SHOWN								
	Po	ole			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			TOTAL	-		48			
* Thi	c ctructure ut	ilizoc a	hack-to-hacl	k mounting	configuration				

* 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	220	240	277 (60)	347 (60)	380	480
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

SCALE IN FEET 1 : 100

0' 100' 200'

ENGINEERED DESIGN By: D. Lohman · File #215837A · 21-Jul-23

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \otimes



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

Project Information

Control System

Control System ID:

Control System Type:

Control-Link Control and Monitoring

System

120/60

6453.0

700.0

 $Communication \ Type:$

Project Notes:

PRELIMINARY CONTROL SUMMARY

240V/1P, LED C&M, Powerline.

Power Requirements

Control cabinet(s):

Control voltage (phase to neutral VA loading - Inrush VA loading - Sealed

Lighting Circuits:

Voltage/Hertz/Phase

	Equipment L	isting	
)	Description	Qty	Size (in)
)	Control and monitoring cabinet - primary	1	24 X 72
ı	Control and monitoring cabinet -	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.

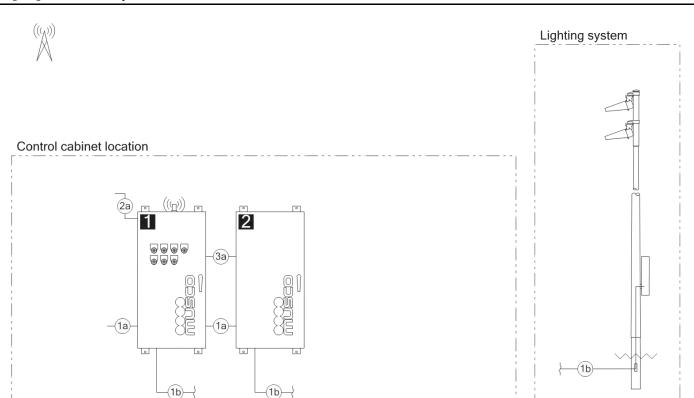


ATTACLIMENTO

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	5

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.
- Control power with equipment ground to control cabinet. Requires dedicatedA 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

- Control and monitoring cabinet primary
- 2 Control and monitoring cabinet secondary



ATTAQUIMENTO

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

Sales Representative: Karin Anderson | Project Engineer: Evan Gray | Scan: 215837A | Document ID: 215837P1V1-0828081505



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 Local Phone: 563/263-2281 Toll Free: 800/756-1205 Fax: 800/374-6402



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:
 - 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.
 - 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 Area of Lighting Average Targe Illumination Levels		Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing	
Baseball	50fc infield/ 30fc	2:1 infield/ 2.5:1	25 infield/	30' x 30'	
Daseball	Outfield	Outfield	109 outfield	30 X 30	
Softball A	50fc infield/ 30fc	2:1 infield/ 2.5:1	25 infield/	20' x 20'	
Solibali A	Outfield	Outfield	119 outfield	20 X 20	
Softball B	50fc infield/ 30fc	2:1 infield/ 2.5:1	25 infield/	20' x 20'	
Solibali b	Outfield	Outfield	146 outfield	20 X 20	
Softball C	50fc infield/ 30fc	2:1 infield/ 2.5:1	25 infield/	20' x 20'	
Solibali C	Outfield	Outfield	132 outfield	ZU X ZU	

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- 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.

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TECHNICAL SPECIFICATIONS FOR TEWINKLE PARK ATHLETIA CAMPINENT 2

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.
 - Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
 - 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.

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TECHNICAL SPECIFICATIONS FOR TEWINKLE PARK ATHLETIA CAMPINENT 2

- 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

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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.
 - 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

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TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIA TO AND PIMENT 2

- 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.

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TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETICATION 2

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
110	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.
	В	Equipment Layout	Drawing(s) showing field layouts with pole locations
	С	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).
	н	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.
	К	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.

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TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETICATION 2

	M	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
Ī	N	Non-	Manufacturer shall list all items that do not comply with the specifications. If in full compliance,
		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:

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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.
- 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.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX

ATTACHMENT 2

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.



TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX

ATTACHMENT 2

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.



Lighting System

Terwinkle Park LED Retrofit

e/Fixture S						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circui
A1	70'	71'	2	TLC-LED-1200	2.34 kW	В
		71'	1	TLC-LED-900	0.88 kW	В
		16'	1	TLC-BT-575	0.57 kW	В
A1-A2	70'	71'	1	TLC-LED-900	0.88 kW	Α
		71'	3	TLC-LED-1200	3.51 kW	Α
		16'	1	TLC-BT-575	0.57 kW	Α
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	С
		16'	1	TLC-BT-575	0.57 kW	С
		81'	2	TLC-LED-900	1.76 kW	С
A4	80'	16'	1	TLC-BT-575	0.57 kW	В
		81'	1	TLC-LED-900	0.88 kW	В
		81'	2	TLC-LED-1200	2.34 kW	В
B1 B4	80'	81'	4	TLC-LED-1200	4.68 kW	В
		16'	1	TLC-BT-575	0.57 kW	В
B1-B2	80'	81'	2	TLC-LED-1200	2.34 kW	Α
		81'	3	TLC-LED-1500	4.23 kW	Α
		16'	1	TLC-BT-575	0.57 kW	Α
B2	80'	81'	4	TLC-LED-1200	4.68 kW	D
B2-B3	80'	18'	1	TLC-BT-575	0.57 kW	D
В3	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	С
B3-B4	80'	81'	5	TLC-LED-1200	5.85 kW	С
B4	80'	18'	1	TLC-BT-575	0.57 kW	С
C1-C2	80'	81'	3	TLC-LED-1200	3.51 kW	Α
		81'	4	TLC-LED-1500	5.64 kW	Α
		16'	2	TLC-BT-575	1.15 kW	А
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
*	1	81'	4	TLC-LED-1200	4.68 kW	C
C7-C8	80'	81'	1	TLC-LED-900	0.88 kW	В
	1	81'	2	TLC-LED-1200	2.34 kW	В
		16'	2	TLC-BT-575	1.15 kW	В
16			130	.20 2. 3.3	133.32 kW	

Circuit Sumn	Circuit Summary					
Circuit	Description	Load	Fixture Qty			
Α	Baseball	44.82 kW	40			
В	Softball A	26.84 kW	28			
С	Softball B	31.52 kW	32			
D	Softball C	30.14 kW	30			

Fixture Type Summary							
Туре	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











Single Luminaire Amperage Draw Chart **Driver Specifications** Line Amperage Per Luminaire (.90 min power factor) (max draw) 208 220 240 277 347 380 480 (60) (60) (60) (60) (60) (60) (60) 3.3 3.2 2.9 2.5 2.0 1.8 1.5 Single Phase Voltage TLC-BT-575 6.9 6.5 6.0 5.2 4.2 3.8 3.0 8.4 7.9 7.3 6.3 5.0 4.6 3.6 5.2 4.9 4.5 3.9 3.1 2.9 2.3 TLC-LED-1200 TLC-LED-1500

Light Level Summary

TLC-LED-900

Terwinkle Park LED Retrofit

Calculation Grid Summary								
Grid Name	Calculation Metric		ı	llumination			Circuits	Fixture Qty
Grid Name	Calculation Metric	Ave	Min	Max	Max/Min	Ave/Min	Circuits	rixture Qty
Baseball (Infield)	Horizontal Illuminance	51.3	38	63	1.68	1.35	Α	40
Baseball (Outfield)	Horizontal Illuminance	30.3	22	44	1.97	1.38	Α	40
Softball A (Infield)	Horizontal Illuminance	50.3	42	60	1.42	1.20	В	28
Softball A (Outfield)	Horizontal Illuminance	30.8	21	42	2.00	1.47	В	28
Softball B (Infield)	Horizontal Illuminance	51.1	40	63	1.58	1.28	С	32
Softball B (Outfield)	Horizontal Illuminance	32	21	46	2.17	1.52	С	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











GRADE MOUNTING LUMINAIRE TYPE LOCATION QTY/POLE SIZE LEVATION TLC-LED-1200 3/2* 70' 71' 3 2 A1 TLC-LED-900 1/1* 16' TLC-BT-575 TLC-LED-1200 A2 70' 71' 3/1* TLC-LED-1500 TLC-LED-900 TLC-BT-575 B1 80' 81' TLC-LED-1200 81' TLC-LED-1500 TLC-BT-575 В2 80' 81' TLC-LED-1200 TLC-LED-1500 81' 18' TLC-BT-575 16' TLC-BT-575 81' TLC-LED-1200 C1-C2 80' 0 81' TLC-LED-1500 0 16' TLC-BT-575 2 0 58 40 33 33 31 26 25 28 28 26 .27 Bell School British British 27 27 30 28 30 31 32 321 23 C2 28 29 30 62 61 28 31 35 1 A2 149′ B2

Terwinkle Park LED Retrofit 2

Grid Summary

Name Baseball
Size Irregular 320'/404'/322'
Spacing 30.0' x 30.0'
Height 3.0' above grade

Illumination Summa	ry	
		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	Α	
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.



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Equipment List For Areas Shown

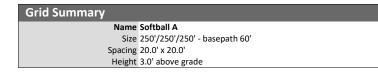
Luminaires

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

Equipment List For Areas Shown Luminaires LUMINAIRE TYPE LOCATION QTY/POLE SIZE TLC-LED-1200 3/2* 3 70' 71' 2 A1 TLC-LED-900 16' TLC-BT-575 TLC-LED-1200 A4 80' 81' 2/1* TLC-LED-900 16' TLC-BT-575 TLC-LED-1200 В1 81' TLC-LED-1500 81' TLC-BT-575 16' TLC-LED-1200 18' TLC-BT-575 TLC-BT-575 16' C7-C8 81' TLC-LED-1200 TLC-LED-900 TLC-BT-575 16' 21 49 28 *This structure utilizes a back-to-back mounting configu

Pole location(s) \bigoplus dimensions are relative to 0,0 reference point(s) \boxtimes

ATTACHMENT 2 Terwinkle Park LED Retrofit



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	В				
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.



Equipment List For Areas Shown Luminaires LUMINAIRE TYPE QTY/POLE LOCATION SIZE TLC-LED-1200 80' 81' 1/1* 1 1 A3 TLC-LED-1500 81' TLC-LED-900 TLC-BT-575 16' 80' TLC-LED-1200 A4 81' TLC-LED-900 TLC-BT-575 TLC-LED-1200 80' 81' TLC-LED-1500 81' TLC-BT-575 16' TLC-BT-575 B4 80' 81' TLC-LED-1200 TLC-BT-575 16' TLC-BT-575 81' TLC-LED-1200 C5-C6 TLC-BT-575 2 2 0 16' 50 32 18 Totals

B4 ⊭

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

ATTACHMENT 2 Terwinkle Park LED Retrofit

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.



Luminaires MOUNTING OTHER GRIDS LUMINAIRE TYPE QTY/POLE LOCATION SIZE TLC-LED-1200 3 A2 70' 71' 3/1* 1 TLC-LED-1500 TLC-LED-900 TLC-BT-575 16' А3 80' 81' TLC-LED-1200 81' TLC-LED-1500 TLC-LED-900 TLC-BT-575 16' 80' B2 81' TLC-LED-1200 TLC-LED-1500 18' TLC-BT-575 TLC-BT-575 16' 81' TLC-LED-1200 TLC-LED-1500 TLC-BT-575 18' TLC-BT-575 16' C3 80' 81' TLC-LED-1200 TLC-LED-900 TLC-BT-575 C4 80' 81' TLC-LED-1200 TLC-LED-1500 81' TLC-LED-900 TLC-BT-575 0 16' 2 Totals 51 30 21 159' B2 *This structure utilizes a back-to-back mounting configuration

Terwinkle Park LED Retrofit 2

Grid Summary

Name Softball C
Size 240'/280'/240' - basepath 60'
Spacing 20.0' x 20.0'
Height 3.0' above grade

Illumination Summa	ry	
		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.



Equipment List For Areas Shown

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes



B4 A4 A2 B2 C6

SCALE IN FEET 1 : 200 0' 200' 400'

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

Terwinkle Park LED Retrofit 2

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

Illumination Summa	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.



B4 A4 A2 B2 C6

SCALE IN FEET 1 : 200 0' 200' 400'

Pole location(s) \oplus dimensions are relative to 0,0 reference point(s) \boxtimes

Terwinkle Park LED Retrofit 2

Grid Summary Name Spill

Spacing 30.0' x 10.0' Height 3.0' above grade

Illumination Summary						
	MAINTAINED MAX VERTICAL FOOTCANDLE					
	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.





Terwinkle Park LED Retrofit ATTACHMENT 2

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.

Equ	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	В3	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	his structure utilizes a back-to-back mounting configuration								

Single Luminaire Amperage Draw Chart							
Driver Specifications		Line	Ampe	rage Pei	Lumin	aire	
(.90 min power factor)			(n	nax drav	w)		
Single Phase Voltage	208	220	240	277	347	380	480
	(60)	(60)	(60)	(60)	(60)	(60)	(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



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ENGINEERED DESIGN By: E.Gray • File #215836B • 28-Aug-23

SCALE IN FEET 1:100

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

TECHNICAL SPECIFICATIONS FOR TEWINKLE PARK ATHLETIC COMPLEX

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:

Control System Type:

Control-Link Control and Monitoring

Communication Type:

Project Notes:

PRELIMINARY CONTROL SUMMARY

480V/3P, LED C&M, Powerline.

Power Requirements

Control cabinet(s):

Control voltage (phase to neutral VA loading - Inrush VA loading - Sealed

Lighting Circuits:

Voltage/Hertz/Phase

	Equipment Listing					
120/60	Description	Qty	Size (in)			
	Control and monitoring cabinet - primary	1	24 X 72			
480/60/3	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.



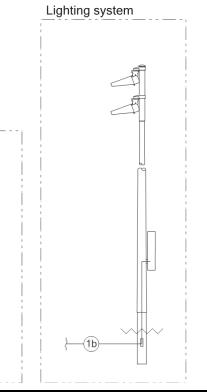
System Requirements: Control System Summary

Project Name: Tewinkle Park 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





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				99
—(1a)—	35	_(1a)_		- 3Ē

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

- 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

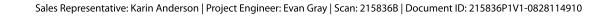
Circuit Summary

Switching Schedule					
Field/Switch Description Switches					
Baseball	1				
Softball A	2				
Softball B	3				
Softball C	4				

Control Module ID: 1

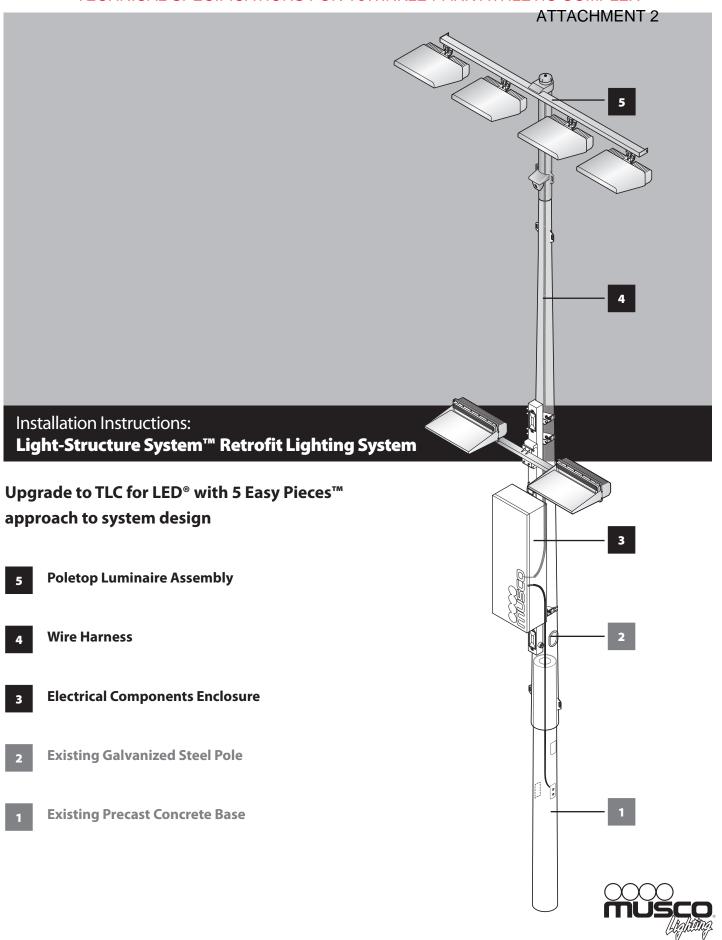
Lighting Circuit Voltage: 480/60/3

	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	В3	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	А3	4	6.36	30	2	C20
	Softball C	B2	5	9.05	30	2	C21
	Softball C	В3	5	9.6	30	2	C22
	Softball C	C3	6	9.05	30	2	C23
	Softball C	C4	6	9.6	30	2	C24





TECHNICAL SPECIFICATIONS FOR TeWINKLE PARK ATHLETIC COMPLEX



We Make It Happen

Installation Instructions: Light-Structure System™ Retrofit Lighting System

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Poletop Luminaire Assembly Overview Assembly Procedure	
Bolt-on Crossarms Overview Assembly Procedure	
Wire Harness OverviewAssembly Procedure	
Connecting to Supply Wiring OverviewInstallation Procedure	



Installation Instructions: Light-Structure System™ Retrofit Lighting System

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.



Installation Instructions: Light-Structure System™ Retrofit Lighting System

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 $\frac{3}{2}$, $\frac{7}{6}$ and $\frac{9}{6}$ 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
% in wrench	Tightening poletop set screw, pole cap fastener, enclosure hanger bolt, and spreader bar hardware	11-32
1% in socket, extension, breaker bar, and $1%$ in wrench	Tightening structural fasteners	13, 31
% in ratcheting combination wrench	Tightening captive bolts to secure luminaire assembly	26
⅓₂ in hex key	Attaching handhole covers on base and steel pole	33, 35
¾ in hex key	Attaching grounding conductors inside electrical enclosure	35
% 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	Assem	bly	Drav	ving
--	-------	------	-------	-----	------	------

- Field Aiming Diagram
- ☐ Control System Summary



If you do not have all of these documents, contact your local Musco representative.



Installation Instructions: Light-Structure System™ Retrofit Lighting System

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.

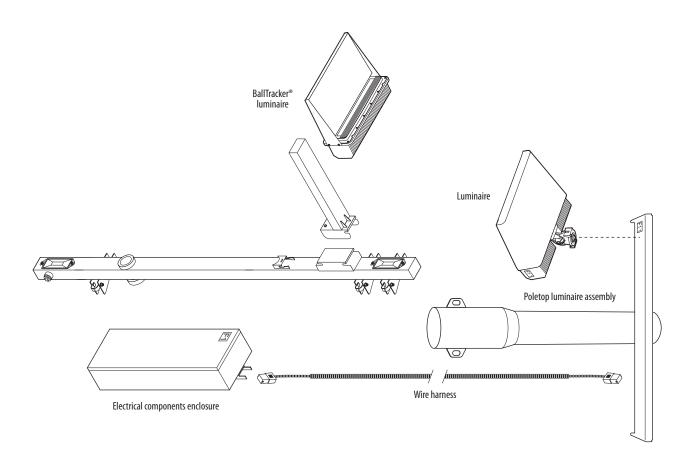
Ensure supply wiring is rated for 90°C. Review the label inside the electrical components enclosure door and *Control System Summary* for voltage and phase requirements.

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





Installation Instructions: Light-Structure System™ Retrofit Lighting System

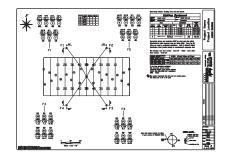
Before You Begin

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:

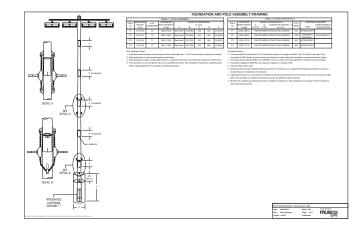
- Control system diagram and details
- Contactors and cabinets
- · Lighting circuits
- Voltage, phase, and frequency
- Full load current for each circuit



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





Installation Instructions: **Light-Structure System™ Retrofit Lighting System**

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.









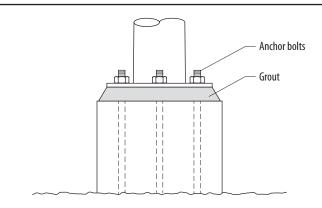
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Installation Instructions: Light-Structure System™ Retrofit Lighting System

Before You Begin

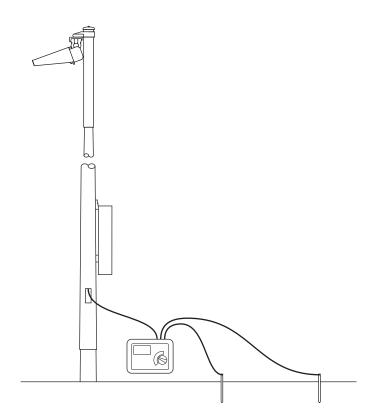
Inspections

- A qualified inspector must examine the base and pole sections for damage or prior field modifications.
- Repair grout on baseplate poles (if necessary).

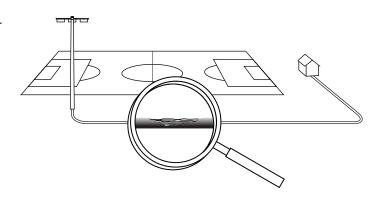


If pole is equipped with an external ground rod, test earth ground connection of pole. If greater than 25 ohms, install additional ground rod and retest.

Repeat until < 25 ohms.



- 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.





TECHNICAL SPECIFICATIONS FOR TEWINKLE PARK ATHLETIC COMPLEX

ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

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

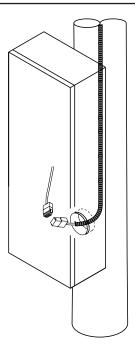
	sco Supplied (For bolt-on crossarms.)
	11/16 in socket, 3/4 in drive
	Breaker bar, ¾ in drive
	4 in extension, ¾ in drive
	11/16 in wrench
Cor	ntractor Supplied % in wrench, % in socket and ratchet
	Angle grinder with metal cutting wheel
	Crane and slings to support poletop luminaire assembly
	Dead blow hammer
	Ratchet, ¾ in drive



Installation Instructions: Light-Structure System™ Retrofit Lighting System

Disassembly

In electrical components enclosure, disconnect pole harness from enclosure harness. Feed end of pole harness into pole interior. Cut off connector if necessary.



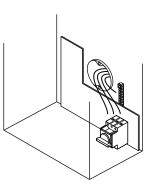


Warning

Risk of electrical shock

Ensure all circuits are disconnected before proceeding

- Disconnect electrical supply wiring and equipment grounding conductor.
- Remove wire harnesses between top, middle, and bottom boxes.
- Remove wiring between stacks.



Installation Instructions: Light-Structure System™ Retrofit Lighting System

Disassembly

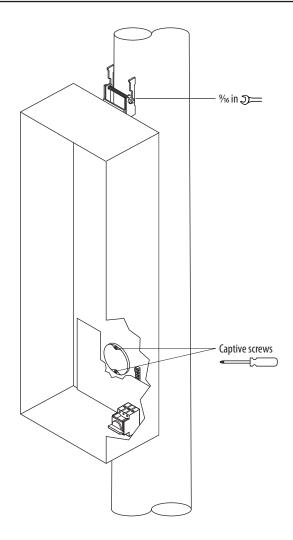
- Using % in wrench and Phillips screwdriver, loosen enclosure hanger bolts, and captive hub screws.
- Using a crane and sling, remove enclosures from the stack, starting at the top.

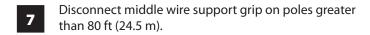


Caution

Electrical components enclosures are heavy.

Enclosures may weigh up to 225 lb (102 kg). Lift with caution.







Leave the pole harness connected to the poletop luminaire assembly. It will pull out as the poletop is removed.





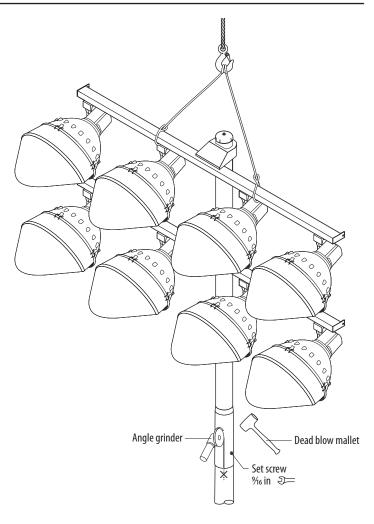
Disassembly

- 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*.
- Using % in wrench, loosen set screw.
- 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.

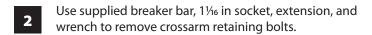
- Use an angle grinder to make a relief cut in the overlap area of the poletop luminaire assembly. Do not damage the pole section underneath the poletop.
- Tap on the poletop with a dead blow mallet until it begins to move and separate.

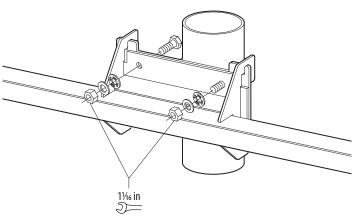


Disassembly

Bolt-On Crossarm Removal

Use crane and sling to support crossarm.







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

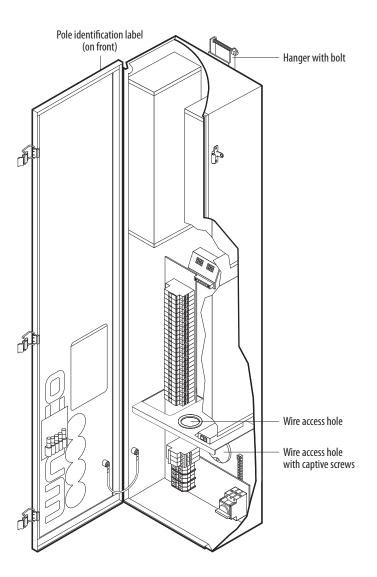
- ☐ ½ and % in offset combination wrenches
- Snips
- ☐ Field Aiming Diagram

Contractor Supplied

- ☐ Torque wrench with ½ and ¾ 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

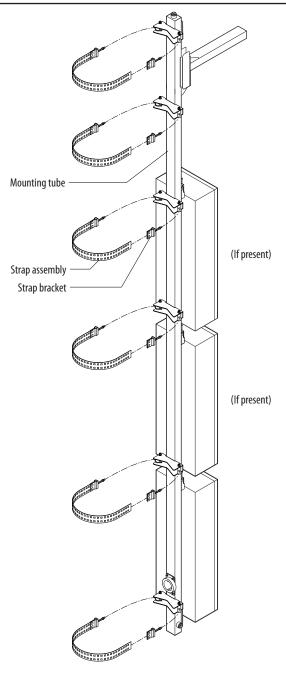
Diameter	Round Pole Strap Length
0 – 17 in (0 – 432 mm)	45 in (1143 mm)
17.01 – 22 in (432 – 559 mm)	60 in (1524 mm)
22.01 – 28 in (559 – 711 mm)	78 in (1981 mm)
28.01 – 34 in (711 – 864 mm)	96 in (2438 mm)
34.01 – 40 in (864 – 1016 mm)	114 in (2896 mm)
40.01 – 46 in (1016 – 1168 mm)	132 in (3353 mm)

Square Pole Strap and Bracket Selection

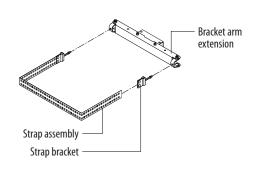
Width	Strap Length	Bracket Arm Extension Width
0-12 in (0-304 mm)	45 in (1143 mm)	14 in (356 mm)
12.01 – 16 in (304 – 406 mm)	60 in (1524 mm)	18.5 in (470 mm)
16.01 – 20 in (406 – 508 mm)	78 in (1981 mm)	22.5 in (572 mm)
20.01 – 24 in (508 – 610 mm)	96 in (2438 mm)	26.5 in (673 mm)
24.01 – 28 in (610 – 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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Installation Instructions: Light-Structure System™ Retrofit Lighting System

Electrical Components Enclosure and BallTracker® Luminaire



Verify pole ID on electrical components enclosure matches pole location on *Field Aiming Diagram*.

Assembly Procedure

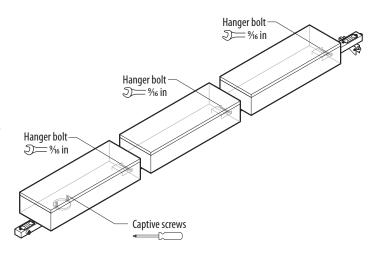


Caution

Electrical components enclosures are heavy.

Electrical components enclosure may weigh up to 65 lb (30 kg). Lift carefully with two people to avoid injury.

- Mount bottom enclosure on tube. Align wire access hole with hub. Tighten captive screw using Phillipshead screwdriver. Tighten hanger bolt with % in wrench.
- Mount middle and/or top enclosures. Align access hole with hub and slide box onto hanger bracket. Tighten hanger bolt with % in wrench.



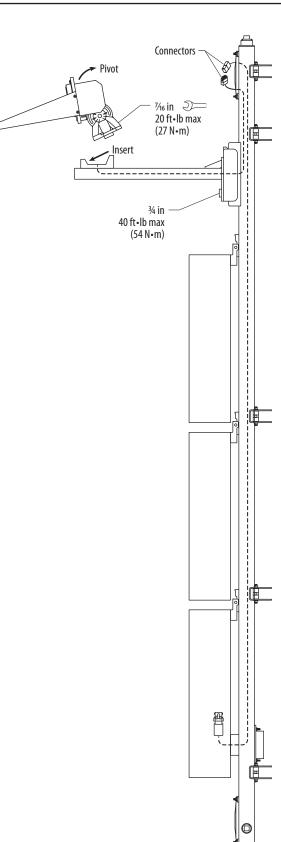


Electrical Components Enclosure and BallTracker® Luminaire

- 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).
- 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.
- Attach luminaire using % in wrench. Tighten captive screws until fully tight. Do not exceed 20 ft-lb (27 N-m).
- Pull BallTracker® wire harness through tube.
 Feed bottom of harness into enclosure hub.
- 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.
- Attach support grips at top handhole.
- Mate quick-connectors at poletop and inside electrical components enclosure(s). Match driver/luminaire IDs.





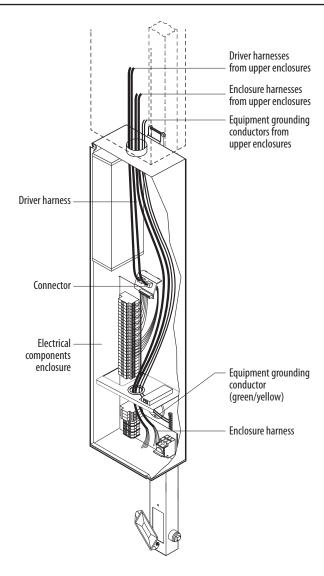
Installation Instructions: Light-Structure System™ Retrofit Lighting System

Electrical Components Enclosure and BallTracker® Luminaire



Only qualified personnel may perform wiring. Route wires as shown, but leave the final connections for your electrician.

- Route driver harnesses from top and middle enclosures to bottom enclosure and plug into connector mounted in bracket.
- Route equipment grounding conductor and enclosure harnesses from top and middle enclosures to bottom enclosure.





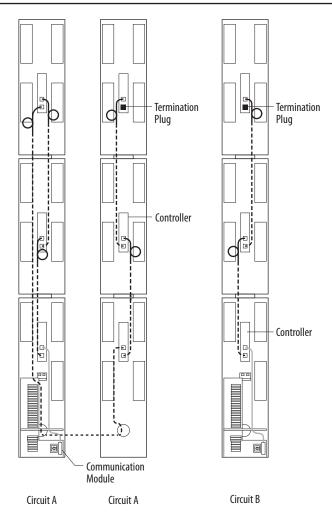
Installation Instructions: Light-Structure System™ Retrofit Lighting System

Electrical Components Enclosure and BallTracker® Luminaire

Skip Step 9–10 if controller not present

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.





Installation Instructions: **Light-Structure System™ Retrofit Lighting System**

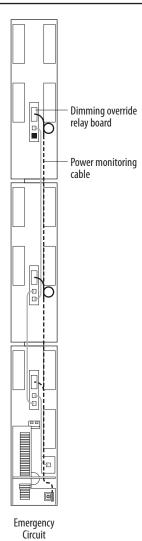
Electrical Components Enclosure and BallTracker® Luminaire



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

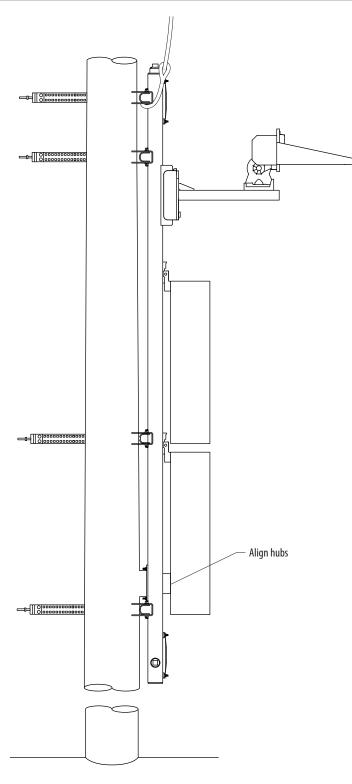


Verify pole ID on electrical components enclosure matches pole location on Field Aiming Diagram.

- - Sling enclosure stack under the welded arm for strapping connections (not under the BallTracker luminaire crossarm) and lift enclosure stack.
- - 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.





Installation Instructions: Light-Structure System™ Retrofit Lighting System

Electrical Components Enclosure and BallTracker® Luminaire

- 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.
- Attach brackets to pole. Torque 5% in strap bracket hardware A to 12 ft•lb (16 N•m) using ½ in socket and torque wrench. Torque all % in tensioning nuts B to 20 ft•lb (27 N•m) using % in socket and torque wrench.



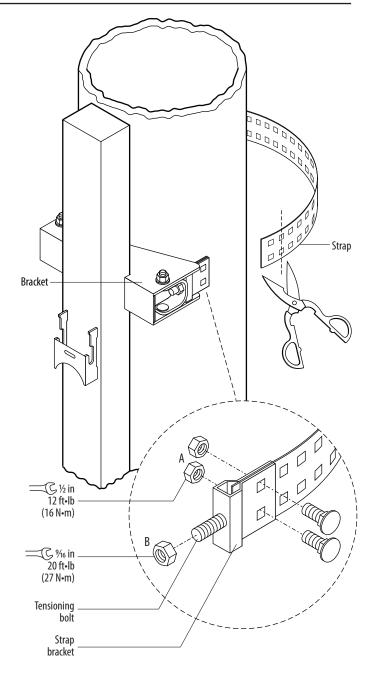
Caution

Falling equipment hazard

Ensure you meet torque values specified on all tensioning hardware.



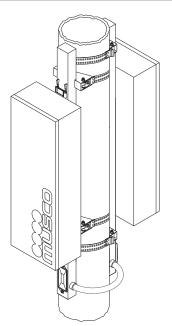
If tensioning bolt is fully seated and strap is not yet tight, trim strap at next set of holes and repeat step 4.





Electrical Components Enclosure and BallTracker® Luminaire

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.



Installation Instructions: Light-Structure System™ Retrofit Lighting System

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



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 ¾ in socket

Assembly Procedure



Verify pole ID on luminaire cartons matches pole and location on *Field Aiming Diagram*.



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

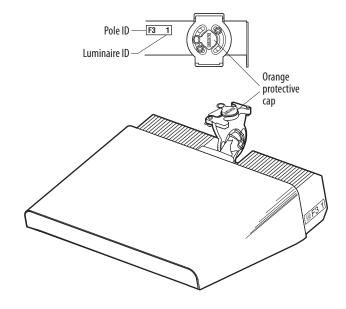
Rotation may be required to assemble all luminaires onto the poletop luminaire assembly. Do not stand under poletop when lifting. Steady with two people holding crossarms. Allow for poletop to safely rotate around when it is high enough for crossarms to clear the ground.



Caution

Equipment Damage

Properly support poletop to ensure luminaires do not get damaged.





Installation Instructions: Light-Structure System™ Retrofit Lighting System

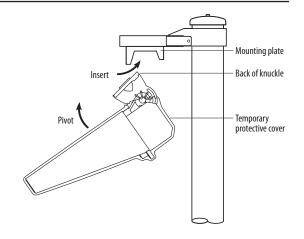
Luminaire Attachment

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.



ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Luminaire Attachment

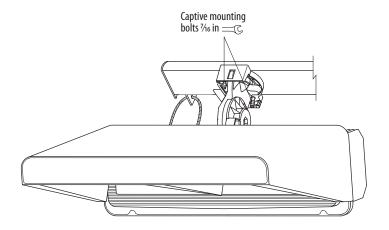
3

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.

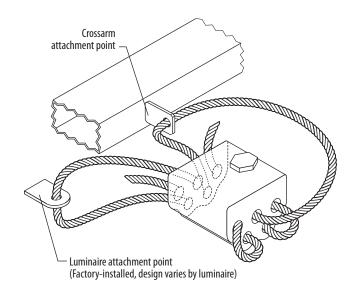


Warning Luminaire may fall if bolts are not tight.

Do not remove tag before tightening bolts.



- 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.
- Using \(\frac{7}{6} \) in socket and torque wrench, tighten cable set screw to 60 in•lb (6.8 N•m).





Installation Instructions: Light-Structure System™ Retrofit Lighting System

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 S	upplied
---------	---------

Contractor Supplied

- Musco Pole Assembly Drawing
- ☐ Two 1½ ton chain come-alongs

- □ % in wrench
- Dishwashing liquid (original Dawn®, ECOS® Pro, or DIAO™ brand)
- 0

If pole utilizes bolt-on bars, skip to next section. See Musco *Pole Assembly Drawing*.

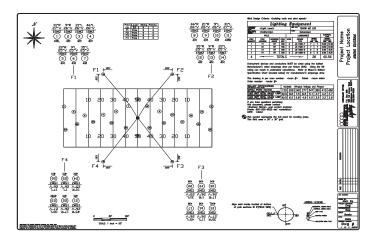
Assembly Procedure



Verify pole ID on each poletop luminaire assembly matches pole location on *Field Aiming Diagram*. Pole ID is labeled on crossarm.

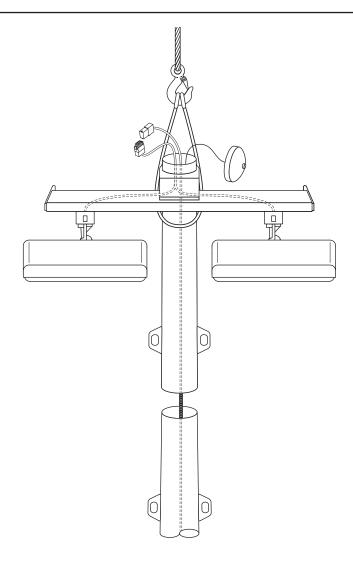
1

Plot and mark aiming point(s) on field. Refer to *Field Aiming Diagram*.



Poletop Luminaire Assembly

- Turn on pole alignment beam.
- Hook pole harness wire support grip to the poletop luminaire assembly u-hook and bundle the pole harness to the bottom crossarm.
- Lubricate top of steel pole section with supplied dishwashing liquid.
- Sling and lift poletop luminaire assembly into place.
- 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



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.

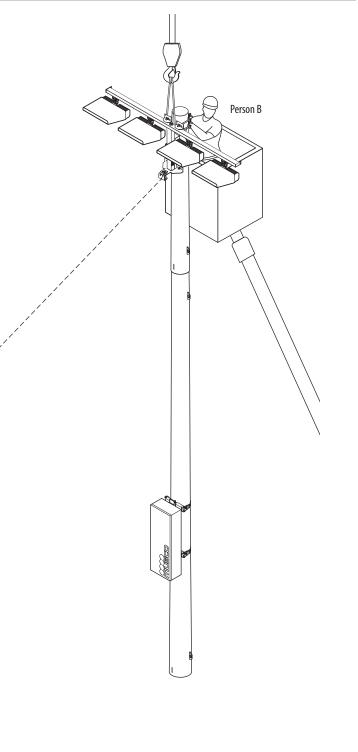
Person B: Following direction from person A, rotate luminaire assembly left or right until it is aligned.



Warning

Falling material hazard

If erecting pole with luminaire assembly attached, do not attach rigging to luminaire assembly. Follow pole supplier instructions for lifting.





Person A

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

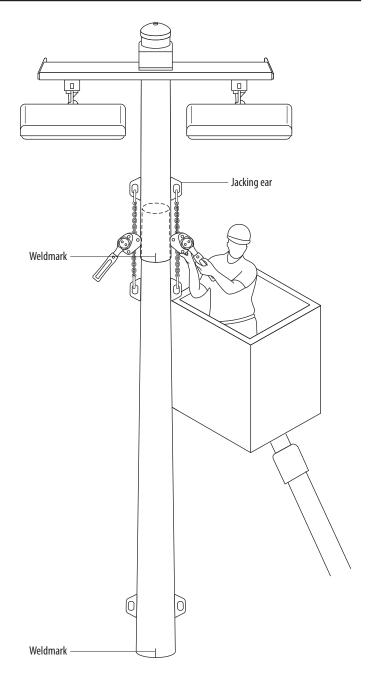
Using two 1½ ton come-alongs, pull poletop luminaire assembly onto pole evenly until tight. Ensure minimum overlap per Musco *Pole Assembly Drawing*.



Ensure alignment is maintained while tightening.

9

Tighten set screw using % in wrench.



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 11/16 in socket
- ¾ in drive breaker bar
- ¾ in drive 4 in extension
- ☐ 1½ in wrench
- Spreader bars
- → ¾ in fasteners (for spreader bars)
- 5% in structural fasteners
- ☐ %6 in wrench

Contractor Supplied:

☐ Torque wrench with % 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.



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.

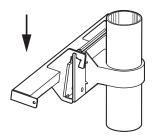
Route wire harness for crossarms 4–7 to handhole below crossarm position 5.

2

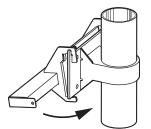
Position crossarm as shown below.



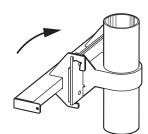
Ensure crossarm wire harness is not pinched between mating plates.











Crossarm

Crossarm wire harness Poletop plate

Crossarm plate

Poletop

Provided

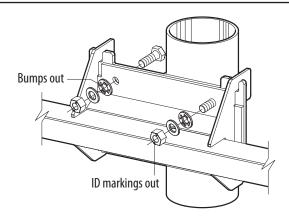
hardware (4 holes)



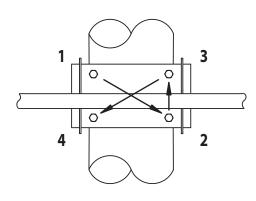
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Bolt-on Crossarms

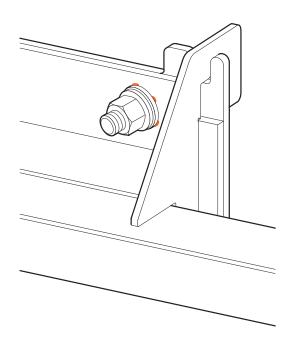
Install bolts through plates with threads away from pole. Place direct tension indicating (DTI) washer next, with flat surface (orange material) against plate, and bumps facing out toward nut. Place flat washer next, followed by nut. Small ID markings on nut must face out to allow proper identification of nut.



Snug all nuts. Using supplied 11/16 in wrench, tighten each nut until plates are in firm contact. Follow tightening sequence shown.



- Using supplied breaker bar, 11/16 in socket, extension, 5 and wrench, tighten each nut until orange extrusion appears from at least three bumps.
- Repeat steps 1-5 for remaining crossarms.
- Do not reuse structural fasteners. Discard if removed or loosened after tightening.



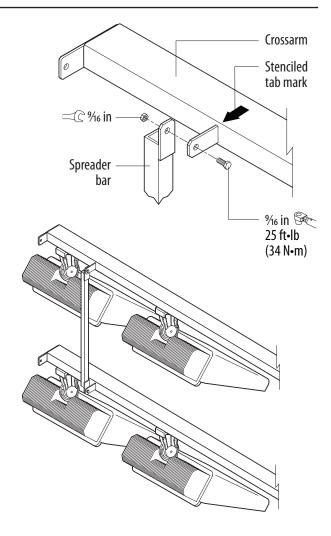


Bolt-on Crossarms

Refer to the Musco Field Aiming Diagram to determine 0 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.

Install spreader bars with ¾ 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.





Installation Instructions: Light-Structure System™ Retrofit Lighting System

Wire Harness

Overview

Tools/Materials Needed

Musco Supplied

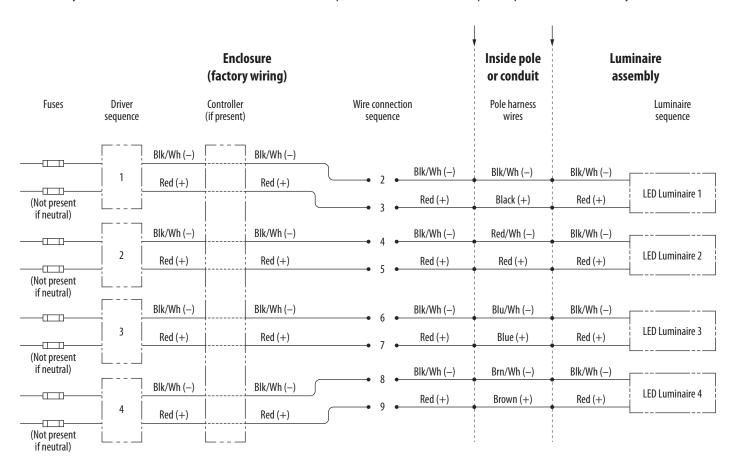
☐ % in wrench

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

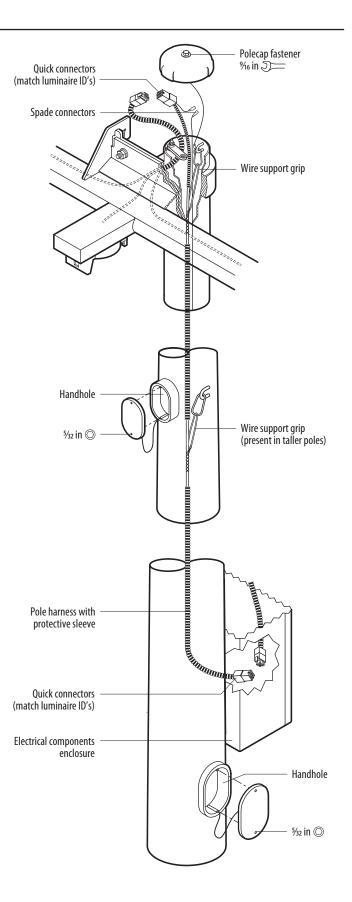


Verify pole ID on wire harness matches pole location on *Field Aiming Diagram*.

- 1 Re
- Remove handhole covers using $\frac{1}{2}$ in hex key. Remove polecap using $\frac{1}{6}$ in wrench.
- 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.
- Attach support grips at midpole (if present).
- 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.
- Replace handhole covers and polecap.





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

- 3/6 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

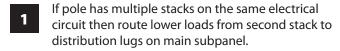
- Standard screwdriver
- ☐ 3 m (10 ft) stepladder or small line truck

Installation Procedure



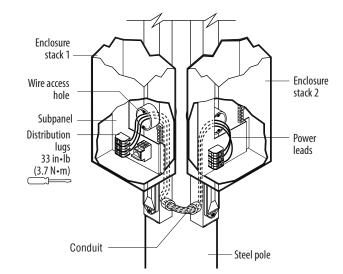
Musco Control System Summary or Field Aiming Diagram provides electrical loading information needed to size wire and switchgear.

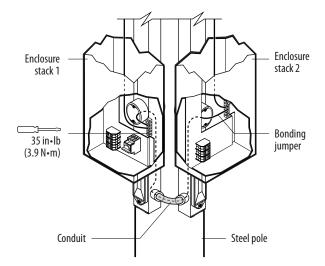
Musco provides instructions for installing Control-Link™ control system or lighting contactor cabinet when these items are part of your project.



Route all power leads for lighting equipment to appropriate subpanel locations.

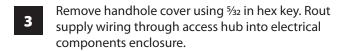
Connect equipment grounding conductors (green/yellow) from each upper enclosure to equipment ground bar in bottom enclosure. If pole has multiple stacks, connect bonding jumper from stack one. Tighten lugs using 3/16 in hex key.

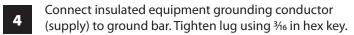


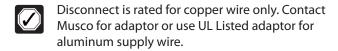




Connecting to Supply Wiring







- 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.
- Route provided equipment bonding jumper (green/yellow) through access hub to pole grounding lug inside handhole. Tighten lug using 1/16 in hex key.
- 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.

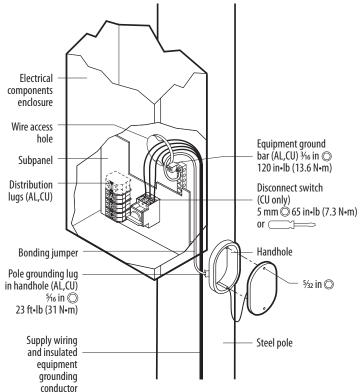
Terminate equipment grounding conductor at equipment ground bar in electrical components enclosure.

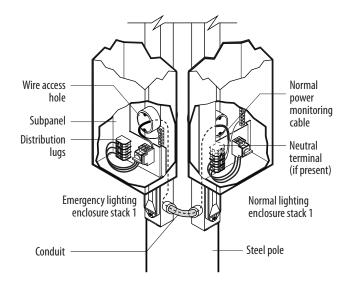


Warning Lightning hazard.

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.
- 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

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Notes

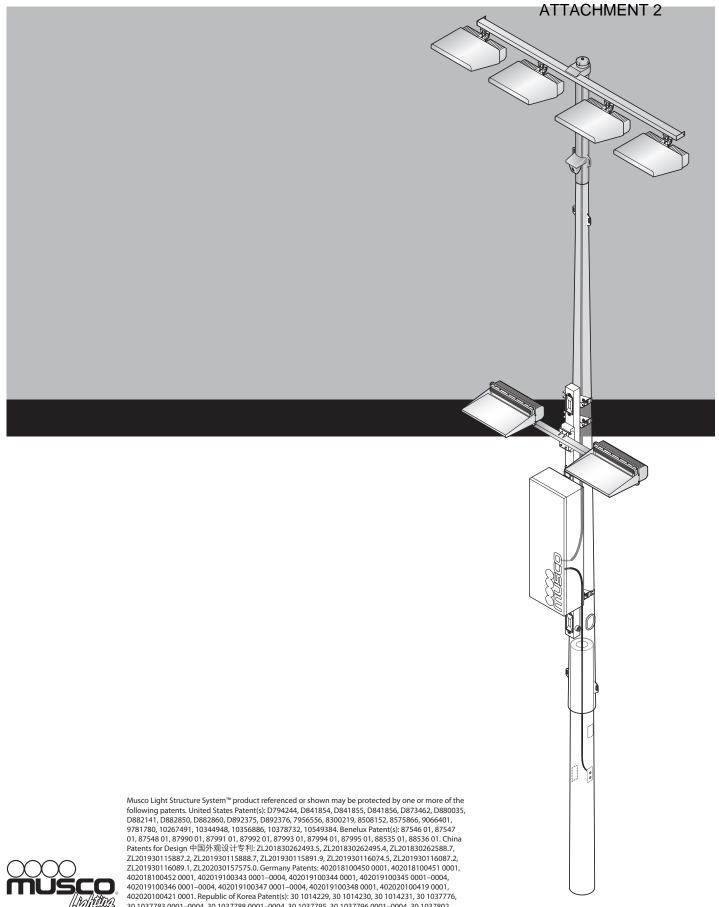


ATTACHMENT 2

Installation Instructions: Light-Structure System™ Retrofit Lighting System

Notes







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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]

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. <u>SCOPE OF WORK</u> .
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. <u>CONTRACT DOCUMENTS</u> .
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

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. <u>CITY'S REPRESENTATIVE</u>.

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

4. <u>CONTRACTOR'S PROJECT MANAGER; PERSONNEL</u>.

- (a) <u>Project Manager</u>. CONTRACTOR's Project Manager must be approved by City. Such approval shall be at CITY's sole discretion.
- (b) <u>Personnel</u>. 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.

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. <u>EQUIPMENT - PERFORMANCE OF WORK.</u>

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. <u>CONTRACT PRICE</u>.

_____(\$____.00).

8. <u>TIME OF PERFORMANCE</u>.

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. <u>TERMINATION</u>.

(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) <u>Termination for Breach of Contract</u>.

- (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.

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.

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.

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. <u>SUPERINTENDENCE BY CONTRACTOR</u>.

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. <u>INSPECTION BY CITY</u>.

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.

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.

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.

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. <u>CONTRACT SECURITY AND GUARANTEE.</u>

Unless previously provided by CONTRACTOR to CITY, 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 standard specifications; provided, however, that CONTRACTOR shall be obligated under this provision only to the extent of those

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

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

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

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) <u>Liability Insurance Coverage</u>.

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:

"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

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. <u>DRUG-FREE WORKPLACE POLICY.</u>

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.

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.

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:

	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
ollows	5:

30. <u>INDEPENDENT CONTRACTOR</u>.

Attn:

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.

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.

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.

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.

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. <u>COUNTERPARTS</u>.

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.

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.]

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	
Lori Ann Farrell Harrison City Manager	Date:
CONTRACTOR	
Signature	Date:
Name and Title	
Signature	Date:
Name and Title	
Social Security or Taxpayer ID Number	
ATTEST:	
Brenda Green City Clerk	Date:
APPROVED AS TO FORM:	
Kimberly Hall Barlow City Attorney	Date:

APPROVED AS TO INSURANCE:	
Ruth Wang Risk Management	_ Date:
APPROVED AS TO PURCHASING:	
	Date:
Carol Molina Finance Director	
DEPARTMENTAL APPROVAL:	
Raja Sethuraman Public Works Director	Date:
Robert Ryan	Date:
Maintenance Services Manager	

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;

SUBJECT	POLICY NUMBER	EFFECTIVE DATE	PAGE
DRUG-FREE WORKPLACE	100-5	8-8-89	3 of 3

- 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.

ATTACHMENT 2	
Rond No	

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 con-	tract 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	ch is incorporated herein
by this reference.		
WHEREAS, Principal has executed or	r is about to execute the contract and the terms there	eof and California Civil
Code section 9554 require the furnishing of a b	oond, providing that if Principal or any of Principal's	s subcontractors fails to
pay for any materials, provisions, or other supp	plies used in, upon, for, or about the performance of	f 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 under	signed Principal, and	, duly
authorized to transact business under the laws of	of the State of California, as Surety (referred to herei	n as "Surety"), are held
and firmly bound unto the City of Costa Mesa,	in the sum of Dollars	s (\$) lawful
money of the United States of America, said sur	m being equal to 100% of the estimated amount paya	able to the City of Costa
Mesa under the terms of the contract, for which	payment well and truly to be made, we bind oursely	es, our heirs, executors,
executors, and administrators, successors and as	ssigns, jointly and severally, firmly by these present.	
THE CONDITION OF THIS OBLIG	SATION IS SUCH, that, if the Principal or the Principal	ncipal's subcontractors
fail to pay for any materials, provisions, or o	other supplies, implements or machinery used in,	upon, for, or about the
performance of the work contracted to be don	e, or for any other work or labor thereon of any ki	nd, or for amounts due
under the Unemployment Insurance Code with	respect to such work or labor, or for any amounts re	equired to be deducted,
withheld and paid over to the Employment De	evelopment Department from the wages of employe	ees of the Principal and
subcontractors pursuant to Section 13020 of t	the Unemployment Insurance Code with respect to	such work and labor,
then the Surety will pay for the same, in an ar	mount not exceeding the sum specified in this Bond	d, and also, in case suit
is brought to enforce the obligations of this B	ond, a reasonable attorneys' fees, to be fixed by the	e Court as required by
the provisions of Section 9554 of the Californ	ia Civil Code.	
This bond shall inure to the benefit of	of any and all persons, companies and corporations	s entitled to file claims
under Section 9100 of the California Civil Cod	le, so as to give a right of action to them or their assi	igns in any suit brought
upon this bond. And the Surety, for value re	eceived, hereby stipulates and agrees that no chan	ige, extension of time,
alteration or addition to the terms of the co	ntract or to the work to be performed thereunde	r or the specifications
accompanying the same shall in any way affec	et its obligations on this Bond, and it does hereby w	aive notice of any such
change, extension of time, alteration or addition	on to the terms of the contract or to the work or to t	he specifications.
IN WITNESS WHEREOF, this instru	ment has been duly executed by the above-named F	rincipal and Surety, on
the, 20	·	
Name of Contractor (Principal)	Authorized Signature/Title	
rame of Contractor (Frincipal)	Authorized Signature/Titte	
Name of Surety	Authorized Agent Signature	
•		
Address of Surety	Print Name and Title	

ATTACHMENT 2	
Bond No.	

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.
hereinafter designated as the "Pri	Mesa, State of California, has awarde ncipal", a Public Works Agreem the City of Costa Mesa, in strict conform	ent for the project known as:
on file with the Costa Mesa City Clerk,	which is incorporated herein by this refer	rence (the "Agreement").
WHEREAS, Principal has execution for the faithful performance of a bond for the faithful performance of the principal has executed by the principal has been principal has executed by the	uted or is about to execute the Agreem ormance of the Agreement.	nent and the terms thereof require the
NOW, THEREFORE, We, the duly authorized to transact business under are held and firmly bound unto the (\$) lawful money of the Unipayable by the City of Costa Mesa under bind ourselves, our heirs, executors and present.	Ety of Costa Mesa, in the sum ofted States of America, said sum being enter the terms of the Agreement, for which p	Surety (referred to herein as "Surety"), Dollars qual to 100% of the estimated amount bayment well and truly to be made, we
The Surety's obligations under Agreement. The Surety's obligations shall the Agreement for completion of the Principal under the Agreement to pay a are specified in the Agreement, actual limited to, all valid and proper backch legal, design professional and delay contains the c	Agreement and correction of defecting liquidated damages, and, for damaged damages caused by non-performance carges, offsets, payments indemnities, of	he responsibilities of Principal under ve work; (2) the responsibilities of ges for which no liquidated damages of the Agreement, including, but not or other damages; and (3) additional
The condition of this obliga administrators, successors or assigns, i all of the work, covenants, conditions, a provided on its part, to be kept and per according to their true intent and mean its officers, employees, and agents, as t it shall be and remain in full force and	and agreements in the Agreement and a formed at the time and in the manner ing, and indemnifies, defends, and sav herein stipulated, then this obligation sl	d well and truly keeps and performs my alteration thereof made as therein therein specified, and in all respects res harmless the City of Costa Mesa,
As part of the obligation secur shall be included costs and reasonable e in successfully enforcing the obligation		
The Surety, for value received additions to the terms of the Agreer accompanying same, shall in any way change, extension of time, or alteration	affect its obligations on this Bond, and	d thereunder, or the specifications it hereby waives notice of any such
IN WITNESS WHEREOF, th Surety, on the day of	is instrument has been duly executed, 20	by the above-named Principal and
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.



CERTIFICATE OF LIABILITY INSURANCE

ATTACHM	ENDATE (MM/DD/YYYY)
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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).

PRO	DUCER	CO	NTACT ME:				
		PH	PHONE FAX (A/C, No, Ext): (A/C, No):				
			E-MAIL ADDRESS:				
		AD					NAIC #
		INS	SURER A :	OKEK(S) AFT OK	DING COVERAGE		NAIC#
INSU	RED						
	· -		SURER B :				
			SURER C :				
		INS	SURER D :				
		INS	SURER E :				
		INS	SURER F :		-		
	VERAGES CERTIFICATE NUMBER:				REVISION NUMBER:		
TH	HIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED B DICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR C	BELOW HAVE E	BEEN ISSUED TO	THE N JRE	TO MMED ABOVE FOR THE COMMENT WITH RESPECT		
CI	ERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE	E AFFORDED	BY THE POLICIE	S DESCRIB	HEREIN IS SUBJECT TO		
	KCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN I		EN REDUCED BY	PAID CLAIMS.			,
INSR LTR	TYPE OF INSURANCE ADDL SUBR POLICY INSD WVD POLICY	NUMBER	POLICA FF (MM/DD/Y	POLICY EXP (MM/D YYYY)	LIMIT	s	
	COMMERCIAL GENERAL LIABILITY				EACH OCCURRENCE	\$	
	CLAIMS-MADE OCCUR	4			DAMAGE TO RENTED PREMISES (Ea occurrence)	\$	
	92 4.1.0 1.2.2 9335.1.	<			MED EXP (Any one person)	\$	
					PERSONAL & ADV INJURY	\$	
	GEN'L AGGREGATE LIMIT APPLIES PER:				GENERAL AGGREGATE	\$	
	POLICY JECT LOC				PRODUCTS - COMP/OP AGG	\$	
	OTHER:		<u> </u>		COMBINED SINGLE LIMIT	\$	
	AUTOMOBILE LIABILITY	17			(Ea accident)	\$	
	ANY AUTO				BODILY INJURY (Per person)	\$	
	ALL OWNED SCHEDULED AUTOS AUTOS	•			BODILY INJURY (Per accident)	\$	
	HIRED AUTOS NON-OWNED AUTOS	•			PROPERTY DAMAGE (Per accident)	\$	
		•				\$	
	UMBRELLA LIAB OCCUR				EACH OCCURRENCE	\$	
	EXCESS LIAB CLAIMS-MAD				AGGREGATE	\$	
	DED RETENTION\$					\$	
	WORKERS COMPENSATION				PER OTH- STATUTE ER	*	
	AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE				E.L. EACH ACCIDENT	\$	
	OFFICER/MEMBER EXCLUDED? N / A (Mandatory in NH)				E.L. DISEASE - EA EMPLOYEE		
	If yes, describe under DESCRIPTION OF OPERATIONS below						
	DESCRIPTION OF OPERATIONS DEIOW				E.L. DISEASE - POLICY LIMIT	Þ	
DESC	CRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Ren	narks Schedule, m	nay be attached if mo	re space is requir	ed)		
CERTIFICATE HOLDER CANCELLATION							
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED B THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVER ACCORDANCE WITH THE POLICY PROVISIONS.							
		AU	THORIZED REPRESE	NTATIVE			

POLICY NUMBER: Enter General Liability Policy Number

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 sho	own 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".

POLICY NUMBER: Enter General Liability policy number

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 show	vn 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:
 - 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.

POLICY NUMBER: Enter General Liability Policy Number Here

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.



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

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: ZZ/ZZ/2014 Policy No. GPVGT" 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.

VENDOR NO.	7	
Add		Date
Start Date Permit Not V	alid After (Expirat	ion Date) Plan No.
		S
, , ,,		1 State
		nse No.
	Address	Telephone No.
		ce Cert. No.(s)
		Telephone No
	T	
Bond \$	48 HOURS MINIMUM REQUIRED	PERMIT APPROVED FOR CITY ENGINEER
Cash Deposit \$	FOR PROCESSING PERMIT	Ву
Issuance \$		Date
Inspection \$	Account #	
TOTAL \$		Underground Service Alert ID No.
residents or businesses twenty-four (3. That a maximum of lane(s Friday as long as traffic can be main 4. That throughout all phases of constru. SUBJECT TO THE NOTES BELOW: (Inspection 1. City will provide inspection between 7 2. Prior to placing Portland Cement Cor 3. Curb and gutter shall not be remov 4. Fill in areas left by curb and gutter rei 5. Bore under all streets, curbs and gutt 6. Open excavations must be backfilled 7. Sidewalk shall be constructed per Cit 8. Driveway approach shall be construct 9. No traffic allowed on concrete for mir 10. Trench compaction and resurfacing s 11. Trenches exceeding five (5) feet in de	(24) hours in advance of any access limitation or traffics) may be closed if necessary to perform work within that intend in each direction with flagmen unless otherwise uction the work site shall be kept clean and free of running to the work site shall be kept clean and free of running to the work site shall be kept clean and free of running to the same that some site of the same that shall be kept clean and free of running to the same that shall be held to the same that shall be shall control about the same that shall be shall conform to the same that shall conform to City of Costa Mesa Standard Drawing No. In the same that shall be shall conform to City of Costa Mesa Standard Drawing No. In the same that shall conform to City of Costa Mesa Standard Drawing No. In the same that shall conform to City of Costa Mesa Standard Drawing No. In the same that shall conform to City of Costa Mesa Standard Drawing hepth require a permit from the Division of Industrial Standard and materials tests deemed necessary by the	he public right of way during the hours of 8:30 a.m 3:30 p.m. Monday throug a approved by the Transportation Services Engineer. bish, debris and dust and drainage shall be maintained. at the approved hourly rate.) spt on City observed holidays). two been inspected and approved; native and imported ded holiday. day that removal occurs. ss. Tunneling is not allowed. during non-working hours. pve. No. 813. tiety, State of Califomia.
13. All trenches shall be permanently pat14. Permittee shall provides the City with	record drawings of permitted work before final inspe-	
All trenches shall be permanently pat Permittee shall provides the City with Permittee understands and agrees to Other:	record drawings of permitted work before final inspe-	ction by the City. ction 15-27 and printed on the reverse of this application.
All trenches shall be permanently pat Permittee shall provides the City with Permittee understands and agrees to Other: NOTICE: Contractor must notify the following Uti Costa Mesa Sanitary District Me	n record drawings of permitted work before final insper or the hold-harmless agreement required by CMMC Se dility Companies two working days before starting work less Consolidated Water District UNDERG	ction by the City. ction 15-27 and printed on the reverse of this application.
All trenches shall be permanently pat Permittee shall provides the City with Permittee understands and agrees to Other: NOTICE: Contractor must notify the following Uti Costa Mesa Sanitary District Me	n record drawings of permitted work before final insper or the hold-harmless agreement required by CMMC Se dility Companies two working days before starting work less Consolidated Water District UNDERG	ction by the City. ction 15-27 and printed on the reverse of this application. ROUND SERVICE ALERT -1-800-422-4133; After Hours & Holidays - (714) 739-3031; (213) 621-3111 CERTIFICATE OF INSPECTION
All trenches shall be permanently pat Permittee shall provides the City with Permittee understands and agrees to Other: NOTICE: Contractor must notify the following Uti Costa Mesa Sanitary District (714) 831-1731	n record drawings of permitted work before final insper to the hold-harmless agreement required by CMMC Se dility Companies two working days before starting work lesa Consolidated Water District UNDERG 14) 631-1200 Toll Free	ction by the City. ction 15-27 and printed on the reverse of this application. : ROUND SERVICE ALERT - 1-800-422-4133; After Hours & Holidays - (714) 739-3031; (213) 621-3111



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 zoni			rding the use of the location at (714) 754-5245.	
Business Address (Cannot be a P.O. Box) Street #	Street name	Unit #	City State 2	Zip
Mailing Address	g	77.5.0		
(Can be a P.O. Box) Street # Business Telephone # ()	Street name Busines	Unit # s Start Date	No. of Employees (on average)	Zip
Ownership (Check One only)	[]Partnership	[]Husband & Wife Co-ownershi		
Seller's Permit No		Contractors State No. & (If Applicable)	Class	
Federal Employer ID # or, Owner's S	ocial Security #	Federal Firearn	ns License # (if applicable)	
	OWNER'S	OR PRINCIPAL'S NAME(S		
Name		Name		
Home Address City	Zip	Home Address City	Zip	
Telephone # ()	Title	Telephone # ()	Title	
Drivers License No.	Date of Birth			
PLEASE CIRCLE ONE: Wholesale/ <u>Fully</u> Describe Business Operation:	Retail/Manufacturing/S			
		Stand	dard Industrial Class Code (SIC)	
Alcohol Beverage Control Permit No. (If Applicable)		Department of Motor (Required for automobile/motor	Vehicles Permit #rcycle sales businesses)	
Hours of Operation (M-F)(Commercial/Industrial only)	(S-SU)	Number of Rental Uni (If Applicable)	ts/Rooms/Spaces	
	CHOOSE ONE OF	THE APPROPRIATE FEES I	PELOW	
GENERAL BUSINESS	CHOOSE OILE OF	TAX EXEMPT ORG		
(wholesale, retail, professional, Etc.)		Attach proof of Tax	Exempt Status (required for waiver of tax de	ue)
Enter Annual Gross Receipts Amount \$_		SHOW, EXHIBITIO	N, SWAP MEET Tax on the Promoter's C	Gross
And Circle the corresponding category be	elow	Receipts from the Gr	oss Receipts schedule to the left	
Annual Gross Receipts	Tax_		.Enter the tax due amount here \$.(# of sellersx \$5 = \$	
\$0.00 to 1,000.00 \$1,000.01 to 25,000.00		EQUALS	Total tax due \$	
\$25,000.01 to 40,000.00	\$35.00	ADMINISTRATIVE	OFFICES/WAREHOUSES	
\$40,000.01 to 75,000.00 \$75,000.01 to 200,000.00		(Fees based on annua	l operating expenses when no receipts gener	rated)
\$200,000.01 to 500,000.00 Over \$500,000.00	\$100.00		ng expenses amount \$ chedule to the left to determine business lice	ense tax.
Over \$500,000.00	\$200.00			
CONTRACTOR (California Licensed) Total tax of	due \$50.00		TAXI, TOW TRUCK, BUS x \$25.00 = Total Tax Due \$	
,				
Will you store, handle or use 55 gallons Will you have an assembly room with a			ear? Yes No Yes No	_
Will you be installing a spray booth?	-	-	Yes No	
Will your business produce dust/wood s Will you be storing or using flammable			Yes No	_
Will you be warehousing materials high		r compressed gases?	Yes No Yes No	_
Fire Department approval required for a		e make an appointment by calling (7		_
business in violation of other Municipal C business location will be checked by Plant building may conform with the requirement information before filing your application. your particular business by writing or visit	code Sections. There will be ning, Building, and, if necesents of the Municipal Code ** Sales or use tax may applying the nearest State Board rrect and true and that acc	e no tax refund if you are found operations of the sary, Fire Department officials. If you administered by these departments, you ply to your business activities. You may do f Equalization. ** I declare under pe	oned that this License does not permit operating illegally after the Certificate has been issue have any doubt whether your business location on are urged to contact these departments for seek written advice regarding the application on alty of perjury that, to the best of my knowle approval of the Business License. Authorize	ed. Your on and/or r further of tax to edge and
Authorized Signature		Titlo	Date	
Sigimure			<i>D</i> aie	
Dlomning Accessed		CLID Dequired?	CLID #	
Planning Approval			CUP #	
Building Approval				
Fire Department Approval	Date Approved			

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.

	1 Name (as shown on your income tax return). Name is required on this line; do	not leave this line blank.			-			
ge 2.	2 Business name/disregarded entity name, if different from above 3 Check appropriate box for federal tax classification; check only one of the fo							
Individual/sole proprietor or C Corporation S Corporation Partnership Trust/estate					4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any)			
single-member LLC 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)				code (if	Exemption from FATCA reporting code (if any)			
급등	Other (see instructions)			(Applies to	accounts mair	ntained outside	the U.S.)	
pecifi	5 Address (number, street, and apt. or suite no.)	Req	uester's name	and addre	ess (option	al)		
See S	6 City, state, and ZIP code							
	7 List account number(s) here (optional)	,						
Pa	art I Taxpayer Identification Number (TIN)							
	ter your TIN in the appropriate box. The TIN provided must match the nam		Social s	ecurity nu	mber			
back	ckup withholding. For individuals, this is generally your social security num	ber (SSN). However, for a						
	sident alien, sole proprietor, or disregarded entity, see the Part I instruction tities, it is your employer identification number (EIN). If you do not have a n			-	-	-		
	titles, it is your employer identification number (Effy). If you do not have a r	umber, see now to get a	or					
	te. If the account is in more than one name, see the instructions for line 1	and the chart on page 4 for		er identification number				
	idelines on whose number to enter.	and the chart on page 4 loi						
				-				
Pa	art II Certification							
Unde	der penalties of perjury, I certify that:							
1. T	The number shown on this form is my correct taxpayer identification num	ber (or I am waiting for a nu	mber to be	issued to	me); and			
S	I am not subject to backup withholding because: (a) I am exempt from backervice (IRS) that I am subject to backup withholding as a result of a failure no longer subject to backup withholding; and							
3. Ia	I am a U.S. citizen or other U.S. person (defined below); and							
4. Th	The FATCA code(s) entered on this form (if any) indicating that I am exemp	ot from FATCA reporting is	correct.					
beca inter- gene	partification instructions. You must cross out item 2 above if you have been cause you have failed to report all interest and dividends on your tax returnerest paid, acquisition or abandonment of secured property, cancellation of the control of t	n. For real estate transaction for debt, contributions to an	ns, item 2 d individual re	oes not a	pply. For arrangem	mortgage ent (IRA)	e , and	

General Instructions

Signature of

U.S. person ▶

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

Sign

Here

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)

Date ▶

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.

Form W-9 (Rev. 12-2014) Page **2**

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.
- 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 allen 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.

Form W-9 (Rev. 12-2014)

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
- $4-\!\mbox{A}$ 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
- $7\!-\!\mathrm{A}$ 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

¹See 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.

Page 3

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.

ATTACHMENT 2 Form W-9 (Rev. 12-2014) Page 4

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:
Individual Two or more individuals (joint account)	The individual The actual owner of the account or, if combined funds, the first individual on the account'
Custodian account of a minor (Uniform Gift to Minors Act)	The minor ²
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-trustee¹ The actual owner¹
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 entity⁴
Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
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

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.

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.

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

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.

Circle the minor's name and furnish the minor's SSN.

PROJECT LOCATIONS MAP

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



LOCATIONS:

- 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 Compa	iny as
surety, are held and firmly bound unto the Ci organized under the laws of the State of Calif	ty of Costa Mesa, a municipal corporation
to be paid to the City, its successors and assimade, we bind ourselves, our heirs, executors jointly and severally firmly by these presents.	igns, for which payment well and truly to be
THE CONDITION OF THIS OBLIGATION IS	SUCH, RMF Contracting, Inc. dba ve bounden, R & M Electrical Contracting , if
accepted by the City of Costa M	esa, and if the above bounden,
RMF Contracting, Inc. dba R & M Electrical Contract	ting , his heirs, executors, administrators,
successors and assigns, shall duly enter	into and execute a contract for such
construction, and shall execute and deliver the	e CERTIFICATE OF INSURANCE and the
LABOR AND MATERIAL and the FAITHFUL F	PERFORMANCE BONDS described within
fourteen (14) days from the date of the ma	niling of a notice of the above bounden,
said contract is ready for execution, then th	
otherwise it shall be and remain in full force ar	nd virtue.
IN WITNESS WHEREOF:	
We hereunto set our hands and seals t	nis 23rd day of October , 2023.
RMF Contracting, Inc. dba R & M Electrical Contracting	Markel Insurance Company
Majulu	- All
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

STATE OF CALIFORNIA DEPARTMENT OF INSURANCE Nº 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 funda	mental organizational documents, is hereby authorized to transact within the State, subject to
all provisio	ns 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,
Sprinkle	er, Team and Vehicle, Automobile, and Miscellaneous 3
as such clas	sses are now or may hereafter be defined in the Insurance Laws of the State of California.
THIS C	CERTIFICATE is expressly conditioned upon the holder hereof now and hereafter being in

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.



B

Historia S. Stabout,

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.

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

Michael C. Keimig, President

State of Texas County of Harris:

Markel Insurance Company

Vice President kindey Jennings

, 2023 A. D., before me, a Notary Public of the State of Texas, in and for the County of Harris, duly commissioned and qualified, On this 24th day of January 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

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

Markel Insurance Company

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

1 1 1

CIVIL CODE 1189

A notary public or other officer completing thi document to which this certificate is attached a	s certificate verifies only the identity of the individual who signed the and not the truthfulness, accuracy, or validity of that document.
State of California)
County of San Bernardino)
OnOCT 2 3 2023before me,	Vanessa Copeland , Notary Public,
personally appeared	Adriana Valenzuela
	Name(s) of Signer(s)
within instrument and acknowledged to m	vevidence to be the person(s) whose name(s) is/are subscribed to the that he/she/they executed the same in his/her/their authorize cure(s) on the instrument the person(s), or the entity upon behalf coment. I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoin paragraph is true and correct. WITNESS my hand and official seal. Signature: Signature: Signature of Notary Public
	OPTIONAL
Though the information below is not required and could present fraudule	red by law, it may prove valuable to persons relying on the document 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)	Capacity(ies) Claimed by Signer(s)
Signer's Name: Adriana Valenzuela	Signer's Name:
☐ Individual	☐ Individual
☐ Corporate Officer – Title(s):	Corporate Officer – Title(s):
☐ Partner: ☐Limited ☐ General	☐ Partner: ☐Limited ☐ General
Attorney in Fact	☐ Attorney in Fact
☐ Trustee	☐ Trustee
☐ Guardian or Conservator	☐ Guardian or Conservator
Other:	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.

attached, and not the truthfulness, accuracy, or validity of that document.
State of California County of On November 6, 2023 , before me, Winsert pame and title of the officer) personally appeared 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 SROWN Notary Public - California Orange County Commission # 2356479 My Comm. Expires May 4, 2025
Signature (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:

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- 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;

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- 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.