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**BUDGET IMPLICATIONS:**

<b>BID AMOUNT:</b> \$ 33,177.10	<b>ACCOUNT:</b> 220.344.0000.5731
<b>BUDGET AMOUNT:</b> \$ 35,000.00	

There are sufficient funds budgeted to complete this project. The Budgeted Amount is expected to fully cover the expense of this project. There is no anticipated unusual or extraordinary impact resulting from the purchase of these materials.

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**ATTACHMENTS:**

The following items are attached for Council review:

- Vendor Master Mailing List
- Copy of Successful Bidder
- Village's LED Application Form

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**STAFF RECOMMENDATION:**

The Council should note that apparently ICECF's calculation of unit prices for each type of LED were generally low, and not very compatible item by item with current industry prices. The Vendor prices generally reflect the more realistic industry prices, while maintaining the highest level of quality in each product.

Staff has budgeted a total of \$35,000 in the Village's Capital Fund for this project, to cover the up-front reimbursable amount of \$25,000, plus the \$8,177 which is the excess amount over the \$25,000 which the ICECF will not cover.

Based on the information provided, from previous work completed in the Village, and from comments received from other municipalities, staff is recommending Traffic Control Corporation as the Vendor to supply the Village with LED Traffic Signal Modules.

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**REQUESTED COURSE OF ACTION:**

- Place this item on the May 10, 2005 Council Meeting agenda for approval.



**Village of Downers Grove  
Public Works  
Memo**

**To:** Rick Ginex, Village Manager

**From:** David Barber, Director of Public Works  
Dorin Fera, Traffic Engineering Manager

**Date:** April 25, 2005

**Subject:** **LED Traffic Signal Modules**  
**VENDOR Master List**

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The following Vendors were mailed the LED Traffic Signal Modules Call for Bids package:

- Tri-Tech Electric
- Meade Electric
- Aldridge Electric
- Virgil Cook & Son, Inc
- Lyons and Pinner Electric
- Traffic Control Corporation
- United Rentals, Inc.

**Energy Efficient LED Traffic Signal Upgrade Grant Program  
2004 APPLICATION FORM - Page 2**

EXISTING EQUIPMENT		Size and Type of Bulb/Signal	Number of Existing Units to be Replaced	Pre Upgrade Wattage in kW (no. of units x existing wattage per unit ÷ 1000)	PROPOSED EQUIPMENT	Size and Type of Bulb/Signal	Number of New Units to be Installed	Post Upgrade Wattage in kW (no. of units x new wattage per unit ÷ 1000)	Rebate = (the lesser of the listed amount or the actual unit cost)	TOTALS (no. of units x rebate per unit)	
Incandescent Pedestrian Signals	8-inch signal			kW	LED Pedestrian Signals	8-inch signal	0	kW	\$40.00	\$0.00	
	12-inch signal	95	6.6 kW	12-inch signal		95	0.5 kW	\$65.00	\$6,175.00		
	8-inch red		kW	8-inch red			kW	\$20.00	\$0.00		
Incandescent Traffic Balls	8-inch green			kW	LED Traffic Balls	8-inch green		kW	\$40.00	\$0.00	
	8-inch yellow			kW		8-inch yellow		kW	\$25.00	\$0.00	
	12-inch red	121	12.1 kW	12-inch red		121	1.2 kW	\$30.00	\$3,630.00		
	12-inch green	121	12.1 kW	12-inch green		121	1.5 kW	\$60.00	\$7,260.00		
	12-inch yellow	121	12.1 kW	12-inch yellow		121	2.7 kW	\$40.00	\$4,840.00		
Incandescent Traffic Arrows	8-inch red			kW	LED Traffic Arrows	8-inch red		kW	\$15.00	\$0.00	
	8-inch green			kW		8-inch green		kW	\$30.00	\$0.00	
	8-inch yellow			kW		8-inch yellow		kW	\$15.00	\$0.00	
	12-inch red	4	0.4 kW	12-inch red		4	0.0 kW	\$25.00	\$100.00		
	12-inch green	45	4.5 kW	12-inch green		45	0.2 kW	\$50.00	\$2,250.00		
	12-inch yellow	0	4.0 kW	12-inch yellow		40	0.4 kW	\$25.00	\$1,000.00		
Total Electricity Demand Before LED Upgrade =				51.8 kW	Total Electricity Demand After LED Upgrade =				6.4 kW	Requested Grant Amount =	\$25,255.00



## CALL FOR BIDS

- I. Name of Company Bidding: Traffic Control Corporation
- II. Instructions and Specifications:
  - A. Bid No.:05-2005
  - B. For: LED TRAFFIC SIGNAL MODULES
  - C. Bid Opening Date/Time: March 14, 2005 9:00 a.m.
  - D. Pre-Bid Conference Date/Time: None
- III. Required of All Bidders:
  - A. Bid Deposit: None
  - B. Letter of Capability of Acquiring Performance Bond: None
- IV. Required of Awarded Contractor(s)
  - A. Performance Bond or Letter of Credit: None
  - B. Certificate of Insurance: **Required**

Legal Advertisement Published: Tuesday, March 1, 2005

Date Issued: Tuesday, March 1, 2005

This document comprises 51 pages

**RETURN ORIGINAL AND TWO DUPLICATE COPIES OF BID IN SEALED ENVELOPE  
MARKED WITH THE BID NUMBER AS NOTED ABOVE TO:**

THERESA H. TARKA  
PURCHASING ASSISTANT  
VILLAGE OF DOWNERS GROVE  
801 BURLINGTON AVENUE  
DOWNERS GROVE, IL 60515  
PHONE: 630/434-5530  
FAX: 630/434-5571  
[www.downers.us](http://www.downers.us)

**CALL FOR BIDS**

**LED TRAFFIC SIGNAL MODULES**

**Bid No.:** 05-2005

The VILLAGE OF DOWNERS GROVE will receive bids Monday thru Friday, 8:00 A.M. to 5:00 P.M. at the Village Hall, 801 Burlington Avenue, Downers Grove, IL 60515.

**SPECIFICATIONS MUST BE MET AT THE TIME THE BID IS DUE.**

The Village Council reserves the right to accept or reject any and all bids, to waive technicalities and to accept or reject any item of any Bid.

The documents constituting component parts of this contract are the following:

- I. CALL FOR BIDS
- II. TERMS & CONDITIONS
- III. DETAILED SPECIFICATIONS
- IV. BID/CONTRACT FORM

**DO NOT DETACH ANY PORTION OF THIS DOCUMENT. INVALIDATION COULD RESULT.** Bidders MUST submit an original and 2 copies of the total Bid. Upon formal award of the Bid, the successful Bidder will receive a copy of the executed contract.

## I. CALL FOR BIDS

### 1. GENERAL

- 1.1 Notice is hereby given that Village of Downers Grove will receive sealed bids up to March 14, 2005 at 9:00 a.m.
- 1.2 Bids must be received at the Village of Downers Grove by the time and date specified. Bids received after the specified time and date will not be accepted and will be returned unopened to the Bidder.
- 1.3 Bid forms shall be sent to the Village of Downers Grove, ATTN: Theresa Tarka, in a sealed envelope marked "SEALED BID". The envelope shall be marked with the name of the project, date, and time set for receipt of Bids.
- 1.4 All bids must be submitted on the forms supplied by the Village and signed by a proper official of the company submitting bid. Telephone, email and fax bids will not be accepted.
- 1.5 By submitting this bid, the bidder certifies under penalty of perjury that he has not acted in collusion with any other bidder or potential bidder.

### 2. PREPARATION OF BID

- 2.1 It is the responsibility of the bidder to carefully examine the specifications and bid documents and to be familiar with all of the requirements, stipulations, provisions, and conditions surrounding the proposed services.
- 2.2 No oral or telephone interpretations of specifications shall be binding upon the Village. All requests for interpretations or clarifications shall be made in writing and received by the Village at least five (5) business days prior to the date set for receipt of bids. The Village shall make all changes or interpretations of the specifications in a written addendum and shall provide an addendum to any bidder of record. Any and all changes to the specifications/plans are valid only if they are included by written addendum to all bidders. Each bidder must acknowledge receipt of any addenda by indicating on the Bid Proposal page. Each bidder, by acknowledging receipt of any addenda, is responsible for the contents of the addenda and any changes to the bid therein. Failure to acknowledge any addenda may cause the bid to be rejected. The Village will not assume responsibility for receipt of any addenda. In all cases, it will be the bidder's responsibility to obtain all addenda issued. Bidders will provide written acknowledgement of receipt of each addendum issued with the bid submission.
- 2.3 In case of error in the extension of prices in the bid, the hourly rate or unit price will

govern. In case of discrepancy in the price between the written and numerical amounts, the written amount will govern.

- 2.4 All costs incurred in the preparation, submission, and/or presentation of any bid including any bidder's travel or personal expenses shall be the sole responsibility of the bidder and will not be reimbursed by the Village.
- 2.5 The bidder hereby affirms and states that the prices quoted herein constitute the total cost to the Village for all work involved in the respective items and that this cost also includes all insurance, royalties, transportation charges, use of all tools and equipment, superintendence, overhead expense, all profits and all other work, services and conditions necessarily involved in the work to be done and materials to be furnished in accordance with the requirements of the Contract Documents considered severally and collectively.

### 3. MODIFICATION OR WITHDRAWAL OF BIDS

- 3.1 A bid that is in the possession of the Village may be altered by a letter bearing the signature or name of person authorized for submitting a bid, provided that it is received prior to the time and date set for the bid opening. Telephone, email or verbal alterations of a bid will not be accepted.
- 3.2 A bid that is in the possession of the Village may be withdrawn by the bidder, up to the time set for the bid opening, by a letter bearing the signature or name of person authorized for submitting bids. Bids may not be withdrawn after the bid opening and shall remain valid for a period of sixty (60) calendar days from the date set for the bid opening, unless otherwise specified.

### 4. PRE-BID CONFERENCE

- 4.1 A pre-bid conference may be offered to provide additional information, inspection or review of current facilities or equipment, and to provide an open forum for questions from bidders. This pre-bid conference is not mandatory (unless stated "Required" on the cover of this document), but attendance by bidders is strongly advised as this will be the last opportunity to ask questions concerning the bid.
- 4.2 For those unable to attend the meeting, questions may be posed in writing to the Village (faxed and emailed questions are acceptable), but must be received by the Village prior to the scheduled time for the pre-bid conference. Questions received will be considered at the conference. An addendum may be issued as a result of the pre-bid conference. Such an addendum is subject to the provisions for issuance of an addendum as set forth in the section titled "Addenda".

5. CATALOGS

- 5.1 Each bidder shall submit catalogs, descriptive literature, and detailed drawings, where applicable, to fully illustrate and describe the material and/or work he proposes to furnish.

6. COMPETENCY OF BIDDER

- 6.1 No proposal will be accepted from or contract awarded to any person, firm or corporation that is in arrears or is in default upon any debt or contract. The bidder, if requested, must present evidence to the Purchasing Assistant of ability and possession of necessary facilities, and financial resources to comply with the terms of the attached specifications and proposals. Evidence must be presented within three (3) business days.

7. TRADE NAMES/SUBSTITUTIONS

- 7.1 Certain materials and equipment are specified by a manufacturer or trade name to establish standards or quality and performance and not for the purpose of limiting competition. Bidders are invited to submit bids not only on named items but also on items that they propose for substitution of named items. Products of other manufacturers may be substituted, if, in the opinion of the Village, they are equal to those specified in quality, performance, design, and suitability for intended use. If the bidder proposes to furnish an "equal", the proposed "equal" item must be so indicated in the written bid. Where two or more items are specified, the selection among those specified is the Contractor's option, or he may submit his bid on all such items. Detail specification sheets shall be provided by bidder for all substituted items.

8. SECURITY FOR PERFORMANCE

- 8.1 The awarded contractor, within thirteen (13) calendar days after acceptance of the bidder's proposal by the Village, shall furnish security for performance acceptable to the Village when required under the documents. Such security shall be either a satisfactory performance bond (bonding company must be licensed to do business in Illinois) or a letter of credit on the form provided by the Village and available from the Village's Purchasing Manager. **NOTE: As evidence of capability to provide such security for performance, each bidder shall submit with the bid proposal either a letter executed by its surety company indicating the bidder's performance bonding capability, or a letter from a bank or savings and loan within twenty-five miles of the corporate boundaries of the Village indicating its willingness and intent to provide a letter of credit for the bidder.**

9. RETURN OF BID DOCUMENTS AND STATEMENT OF "NO BID"

- 9.1 Any bidder who does not submit a proposal is requested to return the enclosed Statement of "No Bid" postcard. Bidders not submitting proposals or "No Bid Statement" may otherwise be removed from our bid mailing list.

**10. SUBMISSION OF BID**

10.1 In all cases, an original and duplicate copy of the sealed bids marked as indicated in Section 1 shall be directed to the Purchasing Department.

10.2 A bid deposit may be required, the amount of which shall be fixed by the Purchasing Manager but which shall not exceed ten percent (10%) of the estimated cost of the work or material to be furnished, nor be less than the sum of twenty-five dollars (\$25.00). Such bid deposit shall be in the form of a certified check, cash or money order. Checks shall be drawn upon a bank of good standing payable to the order of the Village and said deposit shall be forfeited to the Village in the event the bidder shall neglect or refuse to enter into a contract and bond when required, with approved sureties, to execute the work or furnish the material for the price mentioned in his/her bid and according to the plans and specifications in case the contract shall be awarded to him/her. Bids shall be opened at the hour and place mentioned in the notice.

**11. RETURN OF BID DEPOSIT**

11.1 The bid deposit of all except the three (3) lowest responsive bidders on each contract will be returned within fifteen (15) calendar days after the opening of bids. The remaining bid deposits of each contract will be returned within fifteen (15) days after the Village Council has awarded the contract and the required appurtenances to the contract have been received.

**12. WITHDRAWAL OF PROPOSALS**

12.1 Any bidder may withdraw his proposal at any time prior to the time specified in the advertisement as the closing time for the receipt of bids by signing a request therefor. However, no bidder shall withdraw or cancel his proposal for a period of ninety (90) calendar days after said advertised closing time for the receipt of proposals; the awarded contractor shall not withdraw or cancel his proposal after having been notified by the Purchasing Manager that said proposal has been accepted by the Village Council.

**13. BASIS OF AWARD**

13.1 The Village reserves the right to accept or reject any and all bids or to waive technicalities, or to accept or reject any item of any proposal unless the bidder includes a restrictive limitation.

13.2 The Village may award the contract on individual items within a particular group or upon the total group of items.

**14. AWARD OF CONTRACT**

14.1 The contract will be awarded to that responsible bidder whose bid, conforming to the invitation for bids, will be most advantageous to the Village, price and other factors considered. (lowest responsible bidder)

**15. FAILURE TO ENTER INTO CONTRACT**

15.1 By submitting a bid, the bidder understands and agrees that, if his proposal is accepted, and he fails to enter into a contract forthwith, he shall be liable to the Village for any damages the Village may thereby suffer.

**16. TAX EXEMPTION**

16.1 The Village is exempt from Illinois sales or use tax for direct purchases of materials and supplies. A copy of the Illinois Sales Tax Exemption Form will be issued upon request. Our federal identification number will also be provided to the selected vendor.

**17. RESERVED RIGHTS**

17.1 The Village of Downers Grove reserves the right to waive irregularities and informalities, sections to this contract and to accept any bid and to reject any and all bids and to disapprove of any and all subcontractors as may be in the best interest of the Village. Time and date requirements for receipt of bid, however, will not be waived.

## II. TERMS AND CONDITIONS

### **18. VILLAGE ORDINANCES**

18.1 The successful bidder will strictly comply with all ordinances of the Village of Downers Grove and laws of the State of Illinois.

### **19. USE OF VILLAGE'S NAME**

19.1 The bidder is specifically denied the right of using in any form or medium the name of the Village for public advertising unless the Village grants express permission.

### **20. INSPECTION**

20.1 The Village shall have a right to inspect, by its authorized representative, any material, components or workmanship as herein specified. Materials, components or workmanship that have been rejected by the Purchasing Manager as not in accordance with the terms of the contract specifications shall be replaced by the Awarded Contractor at no cost to the Village.

### **21. BACKING PRECAUTIONS**

21.1 Pursuant to Sections 14-139(b) and 14-171.1 of the Downers Grove Municipal Code, any motor vehicle which has an obstructed view to the rear and is to be operated at any time in reverse gear on the public streets of the Village of Downers Grove by the Awarded Contractor or any subcontractor shall either be equipped with a reverse signal alarm (backup alarm) audible above and distinguishable from the surrounding noise level, or shall provide an observer to signal that it is safe to back up.

### **22. OVERWEIGHT, OVERWIDTH AND OVERHEIGHT PERMITS**

22.1 The Village has and supports an overweight truck enforcement program. Contractors are required to comply with weight requirements and safety requirements as established by Illinois Law or Village Ordinance, for vehicles, vehicle operators and specialty equipment. In some instances, specialty equipment for road repairs or construction projects requires the movement of overweight, overwidth, or overheight loads utilizing a Village of Downers Grove roadway. Such movement will require obtaining a permit and permission as follows:

22.2 The Police Department Traffic Supervisor will receive and issue all overweight, overwidth, or overheight permits.

22.3 The Police Department, upon receiving such a request, will determine and direct permit applicant which route will be authorized.

22.4 The Police Department will retain one copy of completed permit form, and one copy will be forwarded to V.O.C.

**23. SPECIAL HANDLING**

- 23.1 Prior to delivery of any product that is caustic, corrosive, flammable or dangerous to handle, the bidder will provide written directions as to methods of handling such products, as well as the antidote or neutralizing material required for its first aid before delivery. bidder shall also notify the Village and provide material safety data sheets for all substances used in connection with this contract which are defined as toxic under the Illinois Toxic Substances Disclosure to Employees Act.

**24. INDEMNITY AND HOLD HARMLESS AGREEMENT**

- 24.1 To the fullest extent permitted by law, the bidder shall indemnify, keep and save harmless the Village and its agents, officers, and employees, against all injuries, deaths, strikes, losses, damages, claims, suits, liabilities, judgments, costs and expenses, which may arise directly or indirectly from any negligence or from the reckless or willful misconduct of the bidder, its employees, or its subcontractors, and the bidder, its employees, or its subcontractors, and the bidder shall at its own expense, appear, defend and pay all charges of attorneys and all costs and other expenses arising therefrom or incurred in connection therewith, and, if any judgment shall be rendered against the Village in any such action, the bidder shall, at its own expense, satisfy and discharge the same. This Agreement shall not be construed as requiring the Bidder to indemnify the Village for its own negligence. The bidder shall indemnify, keep and save harmless the Village only where a loss was caused by the negligent, willful or reckless acts or omissions of the bidder, its employees, or its Subcontractors.

**25. NONDISCRIMINATION**

- 25.1 Bidder shall, as a party to a public contract:
- (a) Refrain from unlawful discrimination in employment and undertake affirmative action to assure equality of employment opportunity and eliminate the effects of past discrimination;
  - (b) By submission of this bid, the bidder certifies that he is an "equal opportunity employer" as defined by Section 2000(e) of Chapter 21, Title 42, U.S. Code Annotated and Executive Orders #11246 and #11375, which are incorporated herein by reference. The Equal Opportunity clause, Section 6.1 of the Rules and Regulations of the Department of Human Rights of the State of Illinois, is a material part of any contract awarded on the basis of this bid.

**26. EQUAL EMPLOYMENT OPPORTUNITY**

- 26.1 In the event of the bidder's non-compliance with the provisions of this Equal Employment Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), the bidder may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and the contract may be canceled

or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute or regulation. During the performance of this contract, the bidder agrees as follows:

- 26.2 That it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
- 26.3 That, if it hires additional employees in order to perform this contract or any portion thereof, it will determine the availability (in accordance with the Department's Rules and Regulations) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
- 26.4 That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, physical or mental handicap unrelated to ability, or an unfavorable discharge from military services.
- 26.5 That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the bidder's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the bidder in its efforts to comply with such Act and Rules and Regulations, the bidder will promptly so notify the Department and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.
- 26.6 That it will submit reports as required by the Department's Rules and Regulations, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations.
- 26.7 That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purpose of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations.
- 26.8 That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same

manner as with other provisions of this contract, the bidder will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the bidder will not utilize any subcontractor declared by the Illinois Human Rights Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivision or municipal corporations.

(Filed February 6, 1981, Effective February 9, 1981.)

- 26.9 It is unlawful to discriminate on the basis of race, color, sex, national origin, ancestry, age, marital status, physical or mental handicap or unfavorable discharge for military service. Bidder shall comply with standards set forth in Title VII of the Civil Rights Act of 1964, 42 U.S.C. Secs. 2000 et seq., The Human Rights Act of the State of Illinois, 68 ILL. Rev. Stat. Secs. 1-101 et seq., and The Americans With Disabilities Act, 42 U.S.C. Secs. 12101 et. seq.

**27. DRUG FREE WORK PLACE**

Bidder, as a party to a public contract, certifies and agrees that it will provide a drug free workplace by:

- 27.1 Publishing a statement: (1) Notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance, including cannabis, is prohibited in the Village's or bidder's workplace. (2) Specifying the actions that will be taken against employees for violations of such prohibition. (3) Notifying the employee that, as a condition of employment on such contract or grant, the employee will: (A) abide by the terms of the statement; and (B) 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.
- 27.2 Establishing a drug free awareness program to inform employee's about: (1) the dangers of drug abuse in the workplace; (2) the Village's or bidder's policy of maintaining a drug free workplace; (3) any available drug counseling, rehabilitation and employee assistance programs; (4) the penalties that may be imposed upon employees for drug violations.
- 27.3 Providing a copy of the statement required by subparagraph 13.1 to each employee engaged in the performance of the contract or grant and to post the statement in a prominent place in the workplace.
- 27.4 Notifying the contracting or granting agency within ten (10) days after receiving notice under part (3)(B) of paragraph 13.1 above from an employee or otherwise receiving actual notice of such conviction.
- 27.5 Imposing a sanction on, or requiring the satisfactory participation in a drug abuse

assistance or rehabilitation program by any employee who is so convicted as required by section 5 of the Drug Free Workplace Act.

27.6 Assisting employees in selecting a course of action in the event drug counseling, treatment and rehabilitation is required and indicating that a trained referral team is in place.

27.7 Making a good faith effort to continue to maintain a drug free workplace through implementation of the Drug Free Workplace Act.

## 28. PREVAILING WAGE ACT

28.1 Bidder agrees to comply with the Illinois Prevailing Wage Act, 820 ILCS 130/1 *et seq.*, for all work completed under this contract. Bidder agrees to pay the prevailing wage and require that all of its subcontractors pay prevailing wage to any laborers, workers or mechanics who perform work pursuant to this contract or related subcontract.

28.2 Bidder and each subcontractor shall keep or cause to be kept an accurate record of names, occupations and actual wages paid to each laborer, workman and mechanic employed by the bidder in connection with the contract. This record shall be open to inspection at all reasonable hours by any representative of the Village or the Illinois Department of Labor and must be preserved for four (4) years following completion of the contract.

28.3 If applicable: Since this is a contract for a fixed public works project, as defined in 820 ILCS 130/2, bidder agrees to post at the job site in an easily accessible place, the prevailing wages for each craft or type of worker or mechanic needed to execute the contract or work to be performed.

## 29. INSURANCE REQUIREMENTS

29.1 Prior to starting the work, Contractor and any Subcontractors shall procure, maintain and pay for such insurance as will protect against claims for bodily injury of death, or for damage to property, including loss of use, which may arise out of operations by the Contractor or Subcontractor or any Sub-Sub Contractor or by anyone employed by any of them, or by anyone for whose acts any of them may be liable. Such insurance shall not be less than the greater of coverages and limits of liability specified below or any coverages and limits of liability specified in the Contract Documents or coverages and limits required by law unless otherwise agreed to by the Village.

Workers Compensation	\$500,000	Statutory
Employers Liability	\$1,000,000	Each Accident
	\$1,000,000	Disease Policy Limit
	\$1,000,000	Disease Each Employee
Comprehensive General Liability	\$2,000,000	Each Occurrence
	\$2,000,000	Aggregate
		<i>(Applicable on a Per Project Basis)</i>
Commercial Automobile Liability	\$1,000,000	Each Accident
Professional Errors & Omissions (pursuant to 15.9 below)	\$2,000,000	Each Claim
	\$2,000,000	Annual Aggregate
Umbrella Liability	\$ 5,000,000	

- 29.2 Commercial General Liability Insurance required under this paragraph shall be written on an occurrence form and shall include coverage for Products/Completed Operations, Personal Injury with Employment Exclusion (if any) deleted, Blanket XCU and Blanket Contractual Liability insurance applicable to defense and indemnity obligations and other contractual indemnity assumed under the Contract Documents. The limit must be on a "Per Project Basis"
- 29.3 Comprehensive Automobile Liability Insurance required under this paragraph shall include coverage for all owned, hired and non-owned automobiles.
- 29.4 Workers Compensation coverage shall include a waiver of subrogation against the Village of Downers Grove.
- 29.5 Comprehensive General Liability, Employers Liability and Commercial Automobile Liability Insurance may be arranged under single policies for full minimum limits required, or by a combination of underlying policies with the balance provided by Umbrella and/or Excess Liability policies.
- 29.6 Contractor and all Subcontractors shall have their respective Comprehensive General Liability (including products/completed operations coverage), Employers Liability, Commercial Automobile Liability, and Umbrella/Excess Liability policies endorsed to add the "Village of Downers, its officers, officials, employees and volunteers" as "additional insureds" with respect to liability arising out of operations performed; claims for bodily injury or death brought against Village of Downers Grove by any Contractor of

Subcontractor employees, or the employees of Subcontractor's subcontractors of any tier, however caused, related to the performance of operations under the Contract Documents. Such insurance afforded to the Village of Downers Grove shall be endorsed to provide that the insurance provided under each policy shall be *Primary and Non-Contributory*.

- 29.7 Contractor and all Subcontractors shall maintain in effect all insurance coverages required by the Contract Documents at their sole expense and with insurance carriers licensed to do business in the State of Illinois and having a current A. M. Best rating of no less than A- VIII. In the event that the Contractor or any Subcontractor fails to procure or maintain any insured required by the Contract Documents, the Village of Downers Grove may, at its option, purchase such coverage and deduct the cost thereof from any monies due to the Contractor or Subcontractor, or withhold funds in an amount sufficient to protect the Village of Downers Grove, or terminate this Agreement pursuant to its terms.
- 29.8 All insurance policies shall contain a provision that coverages and limits afforded hereunder shall not be canceled, materially changed, non-renewed or restrictive modifications added, without thirty (30) days prior written notice to the Village of Downers Grove. Renewal certificates shall be provided to the Village of Downers Grove not less than five (5) prior to the expiration date of any of the required policies. All Certificates of Insurance shall be in a form acceptable to Village of Downers Grove and shall provide satisfactory evidence of compliance with all insurance requirements. The Village of Downers Grove shall not be obligated to review such certificates or other evidence of insurance, or to advise Contractor or Subcontractor of any deficiencies in such documents, and receipt thereof shall not relieve the Contractor or Subcontractor from, nor be deemed a waiver the right to enforce the terms of the obligations hereunder. The Village of Downers Grove shall have the right to examine any policy required and evidenced on the Certificate of Insurance.
- 29.9 If the Work under the Contract Documents includes design, consultation, or any other professional services, Contractor or the Subcontractor shall procure, maintain, and pay for Professional Errors and Omissions insurance, with limits of not less than \$2,000,000 per claim and \$2,000,000 annual aggregate. If such insurance is written on a claim made basis, the retrospective date shall be prior to the start of the Work under the Contract Documents. Contractor and all Subcontractors agree to maintain such coverage for three (3) years after final acceptance of the Project by the Owner or such longer period as the Contract Documents may require. Renewal policies during this period shall maintain the same retroactive date.
- 29.10 Any deductibles or self-insured retentions shall be the sole responsibility of the Insured. At the option of the Municipality, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Municipality, its officers, officials, employees and volunteers; or the Proposer shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

29.11 Are you willing to comply with the Village's preceding insurance requirements within 13 days of the award of the contract? yes

INSURER'S NAME Robert B. McManus Inc.

AGENT Brian McManus

Street Address 111 W. Jackson Blvd Suite 1134

City, State, Zip Code Chicago, IL 60604

Telephone Number ( 312 ) 786-9090

**30. COPYRIGHT/PATENT INFRINGEMENT**

30.1 The bidder agrees to indemnify, defend, and hold harmless the Village against any suit, claim, or proceeding brought against the Village for alleged use of any equipment, systems, or services provided by the Bidder that constitutes a misuse of any proprietary or trade secret information or an infringement of any patent or copyright.

**31. SUBLETTING OF CONTRACT**

31.1 No contract awarded by the Village of Downers Grove shall be assigned or any part sub-contracted without the written consent of the Village Manager. In no case shall such consent relieve the Awarded Bidder from his obligation or change the terms of the contract.

**32. TERM OF CONTRACT**

32.1 This contract may be extended no more than twice for subsequent annual periods (two annual extensions) by mutual agreement of both parties, providing such agreement complies with Village purchasing policies and the availability of funds.

**33. TERMINATION OF CONTRACT**

33.1 The Village reserves the right to terminate the whole or any part of this contract, upon written notice to the Awarded Bidder, for any reason and/or in the event that sufficient funds to complete the contract are not appropriated by the Village of Downers Grove.

33.2 The Village further reserves the right to terminate the whole or any part of this contract, upon ten (10) days' written notice to the Awarded Bidder, in the event of default by the Awarded Bidder. Default is defined as failure of the Awarded Bidder to perform any of the provisions of this contract or failure to make sufficient progress so as to endanger performance of this contract in accordance with its terms. In the event that the Awarded Bidder fails to cure the default upon notice, and the Village declares default and termination, the Village may

procure, upon such terms and in such manner as the Purchasing Manager may deem appropriate, supplies or services similar to those so terminated. The Awarded Bidder shall be liable for any excess costs for such similar supplies or services unless acceptable evidence is submitted to the Purchasing Manager that failure to perform the contract was due to causes beyond the control and without the fault or negligence of the Awarded Bidder. Any such excess costs incurred by the Village may be set-off against any monies due and owing by the Village to the Awarded Bidder.

#### **34. DELIVERIES**

- 34.1 All materials shipped to the Village of Downers Grove must be shipped F.O.B. designated location, Downers Grove, Illinois.

#### **35. BILLING & PAYMENT PROCEDURES**

- 35.1 Payment will be made upon receipt of an invoice referencing Village of Downers Grove purchase order number. Once an invoice and receipt of materials or service have been verified, the invoice will be processed for payment in accordance with the Village of Downers Grove payment schedule. The Village of Downers Grove will comply with the Local Government Prompt Payment Act, 50 ILCS 505/1 et seq., in that any bill approved for payment must be paid or the payment issued to the bidder within 60 days of receipt of a proper bill or invoice. If payment is not issued to the bidder within this 60 day period, an interest penalty of 1.0% of any amount approved and unpaid shall be added for each month or fraction thereof after the end of this 60 day period, until final payment is made.

- 35.2 The Village of Downers Grove shall review in a timely manner each bill or invoice after its receipt. If the Village of Downers Grove determines that the bill or invoice contains a defect making it unable to process the payment request, the Village shall notify the bidder requesting payment as soon as possible after discovering the defect pursuant to rules promulgated under 50 ILCS 505/1 et seq. The notice shall identify the defect and any additional information necessary to correct the defect.

- 35.3 Please send all invoices to the attention of Village of Downers Grove, Accounts Payable, 801 Burlington, Downers Grove, IL 60515.

#### **36. COMPLIANCE WITH OSHA STANDARDS**

- 36.1 Equipment supplied to the Village must comply with all requirements and standards as specified by the Occupational Safety and Health Act. All guards and protectors as well as appropriate markings will be in place before delivery. Items not meeting any OSHA specifications will be refused.

**37. CERCLA INDEMNIFICATION**

37.1 The Awarded Bidder shall, to the maximum extent permitted by law, indemnify, defend, and hold harmless the Village, its officers, employees, agents, and attorneys from and against any and all liability, including without limitation, costs of response, removal, remediation, investigation, property damage, personal injury, damage to natural resources, health assessments, health settlements, attorneys' fees, and other related transaction costs arising under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, 42 U.S.C.A. Sec. 9601, et seq., as amended, and all other applicable statutes, regulations, ordinances, and under common law for any release or threatened release of the waste material collected by the Awarded Bidder, both before and after its disposal.

**38. RELATIONSHIP BETWEEN THE BIDDER AND THE VILLAGE**

38.1 The relationship between the Village and the bidder is that of a buyer and seller of professional services and it is understood that the parties have not entered into any joint venture or partnership with the other.

**39. STANDARD OF CARE**

39.1. Any services performed by bidder under this Agreement will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representations express or implied, and no warranty or guarantee is included or intended in this Agreement, or in any report, opinions, and documents or otherwise.

39.2 If the bidder fails to meet the foregoing standard, bidder will perform at its own cost, and without reimbursement from the Village, the professional services necessary to correct errors and omissions caused by bidder's failure to comply with the above standard and reported to bidder within one (1) year from the completion of bidder's services for the Project.

39.3 For Professional Service Agreements (i.e. Engineer, Consultant): Project site visits by bidder during construction or equipment installation or the furnishing of Project representatives shall not make bidder responsible for: (i) construction means, methods, techniques, sequences or procedures; (ii) for construction safety precautions or programs; (iii) or for any construction contractor(s)' failure to perform its work in accordance with contract documents.

**40. GOVERNING LAW**

40.1 This Agreement will be governed by and construed in accordance with the laws of the State of Illinois. Venue is proper only in the County of DuPage for state cases or the Northern District of Illinois for federal cases.

**41. SUCCESSORS AND ASSIGNS**

41.1 The terms of this Agreement will be binding upon and inure to the benefit of the parties and their respective successors and assigns; provided, however, that neither party will assign this Agreement in whole or in part without the prior written approval of the other. The bidder will provide a list of key staff, titles, responsibilities, and contact information to include all expected sub-bidders.

**42. WAIVER OF CONTRACT BREACH**

42.1 The waiver by one party of any breach of this Agreement or the failure of one party to enforce at any time, or for any period of time, any of the provisions hereof will be limited to the particular instance and will not operate or be deemed to waive any future breaches of this Agreement and will not be construed to be a waiver of any provision except for the particular instance.

**43. AMENDMENT**

43.1 This Agreement will not be subject to amendment unless made in writing and signed by all parties.

**44. CHANGE ORDERS**

44.1 The contract price is a "not-to-exceed" cost. At any time additional work is necessary or requested, and the not-to-exceed price is increased thereby, all parties must agree to any change, addition or price increase in writing. The appropriate authorizing signature for the Village is the Village Manager.

**45. SEVERABILITY OF INVALID PROVISIONS**

45.1 If any provisions of this Agreement are held to contravene or be invalid under the laws of any state, country or jurisdiction, contravention will not invalidate the entire Agreement, but it will be construed as if not containing the invalid provision and the rights or obligations of the parties will be construed and enforced accordingly.

**46. NOTICE**

46.1 Any notice will be in writing and will be deemed to be effectively served when deposited in the mail with sufficient first class postage affixed, and addressed to the party at the party's place of business. Notices shall be addressed to designated representatives of both parties as follows:

**Mr. Riccardo Ginex**  
**Village Manager**  
**Village of Downers Grove**  
**801 Burlington Ave.**  
**Downers Grove, IL 60515**

**Name of Contact** \_\_\_\_\_  
**Name of Firm/Business** \_\_\_\_\_  
**Street Address** \_\_\_\_\_  
**City, State, Zip** \_\_\_\_\_

### III. DETAILED SPECIFICATIONS

#### LED TRAFFIC SIGNAL MODULES

##### 1.0 PURPOSE

The purpose of this specification is to provide the minimum performance requirements for 300 mm **(12 in) LED vehicle arrow traffic signal modules**. This specification refers to definitions and practices described in "Vehicle Traffic Control Signal Heads" published in the *Equipment and Materials Standards of the Institute of Transportation Engineers*, referred to in this document as "VTCSH".

##### 1.1 Prequalification.

Furnish LED traffic signal lamps that meet or exceed all the requirements of the current Institute of Transportation Engineers (ITE) publication ST-011B Pedestrian Traffic Control Signal Indications (PTCSI) and the current ITE specifications for Vehicle Traffic Control Signal Heads (VTCSH), Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Module, unless otherwise stated in the specifications herein.

The LED Traffic signal lamps provided shall be Gelcore, Dialight or pre-approved equal. All LED lamps shall be the latest model currently in production and new. Equipment no longer being manufactured shall not be accepted even if it meets the following specifications.

To prove reliability, manufacturer must provide in-state references upon request.

To ensure reliable service and support distributor of products must have physical offices and representatives located within the State of Illinois. Manufacturers will not be permitted to supply product without in-state distribution.

##### 2.0 PHYSICAL AND MECHANICAL REQUIREMENTS

##### 2.1 General

LED vehicle arrow traffic signal modules (The Arrow) designed as retrofit replacements for existing signal lamps shall not require special tools for installation. Retrofit replacement LED arrow shall fit into existing traffic signal housings built to the VTCSH Standard without modification to the housing.

Installation of a retrofit replacement LED arrow into an existing signal housing shall only require the removal of the existing optical unit components, i.e., lens, lamp module and gaskets. It shall be weather tight, fit securely in the housing and shall connect directly to existing electrical wiring. Removal of the incandescent lamp reflector is optional.

##### 2.2 LED Vehical Arrow Traffic Signal Module (The Arrow)

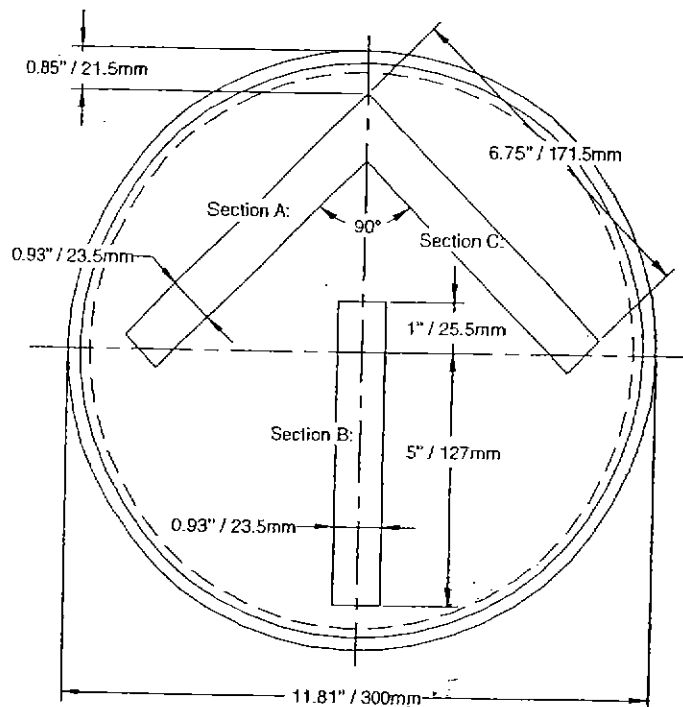
2.2.1 The retrofit LED arrow shall be capable of replacing the optical unit.

2.2.2 Tinting (Optional) -The lens shall be tinted or shall use transparent film or materials with similar characteristics.

2.2.3 The LED arrow lens shall be a replaceable part without the need to replace the complete LED arrow.

2.2.4 The configuration of the arrow icon is illustrated in Figure 1:

**FIGURE 1**



### 2.3 Environmental Requirements

2.3.1 The LED arrow shall be rated for use in the ambient operating temperature range, of  $-40^{\circ}\text{C}$  ( $-40^{\circ}\text{F}$ ) to  $+74^{\circ}\text{C}$  ( $+165^{\circ}\text{F}$ ).

2.3.2 The LED arrow shall be protected against dust and moisture intrusion per NEMA Standard 250-1991 requirements, for Type 4 enclosures to protect all internal LED, electronic, and electrical components.

2.3.3 The LED arrow lens shall be UV stabilized.

### 2.4 Construction

2.4.1 The LED arrow shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply must be designed to fit and mount inside the LED arrow.

2.4.2 The assembly and manufacturing process for the LED arrow assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

## 2.5 Materials

2.5.1 Materials used for the module construction shall conform to ASTM specifications for the materials where applicable.

2.5.2 Enclosures containing the power supply and electronic components of the arrow shall be made of UL94VO flame retardant materials. The lens of the arrow is excluded from this requirement.

## 2.6 Module Identification

2.6.1 Each LED arrow shall be identified on the backside with the manufacturer's name and serial number.

2.6.2 The following operating characteristics shall be identified: nominal operating voltage, power consumption, and Volt-Ampere.

2.6.3 Arrows shall have a prominent and permanent vertical indexing indicator, i.e., UP ARROW or the word UP or TOP, for correct indexing and orientation inside a signal housing.

## 3.0 PHOTOMETRIC REQUIREMENTS

### 3.1 Luminous Intensity & Distribution

3.1.1 The maintained minimum luminous intensity values for LED arrows throughout the warranty period, under the operating conditions defined in Sections 2.3.1, 4.2.1 and 5.4.2, and at the end of the warranty period, shall not be less than the values shown in Table 1.

3.1.2 The uniformity of the icon illumination shall meet a ratio of not more than 1 to 5 between the minimum and maximum illuminance measurements (in Cd/m<sup>2</sup>). A spot size of 12mm shall be used with at least three measurements taken in each of the three sections (A, B & C) shown in figure 1.

3.1.3 LEDs for arrow indications shall be spread evenly across the illuminated portion of the arrow area. Arrow LED traffic signal lamp units shall provide an optical lens that reflects a light distribution look similar to that of an incandescent lamp with the individual LED's not being visible.

### 3.2 Chromaticity

The measured chromaticity coordinates of LED arrows shall be between 500 nm and 650 nm, conforming to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.

**Table 1. Maintained Minimum Luminous Intensity for the LED Vehicle Arrow Traffic Signal Modules.**

Candlepower Values (candelas (cd))				
Vertical Down	Horiz. +/-	12-inch Signal		
		Red	Yellow	Green
2.5°	2.5°	60	150	90
	7.5°	44	110	66
	12.5°	25	62	38
	17.5°	14	35	21
7.5°	2.5°	40	100	60
	7.5°	36	90	54
	12.5°	26	65	39
	17.5°	16	40	24
	22.5°	7	17	11
	27.5°	3	7	4
12.5°	2.5°	9	23	14
	7.5°	9	22	14
	12.5°	8	20	12
	17.5°	6	15	9
	22.5°	4	10	6
	27.5°	3	7	4
17.5°	2.5°	4	10	6
	7.5°	4	10	6
	12.5°	4	10	6
	17.5°	4	9	6
	22.5°	4	8	5
	27.5°	3	7	4

## **4.0 ELECTRICAL**

### **4.1 General**

All wiring and terminal blocks shall meet the requirements of Section 13.02 of the VTCSH standard. Two secured, color coded, 914 mm (36 in) long 600 V, 20 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105°C, are to be provided for electrical connection.

### **4.2 Voltage Range**

**4.2.1** LED arrows shall operate from a  $60 \pm 3$  cycle ac line power over a voltage range from 80 Vac rms to 135Vac rms. The current draw shall be sufficient to ensure compatibility and proper triggering and operation of load current switches and conflict monitors in signal controller units the procuring traffic authority customer has in use.

**4.2.2** Nominal operating voltage for all measurements shall be  $120 \pm 3$  volts rms.

**4.2.3** Fluctuations in line voltage over the range of 80Vac to 135Vac shall not affect luminous intensity by more than  $\pm 10$  percent.

**4.2.4** The LED circuitry shall prevent flicker at less than 100 Hz over the voltage range specified in Section 4.2.1.

#### **4.2.5 Low Voltage Turn Off**

There shall be no illumination from the arrow when the applied voltage is less than 45 volts AC. To test for this condition the unit must first be fully illuminated at the nominal operating voltage. The applied voltage is then reduced to the point that there is no illumination. This point must be greater than 45 volts AC. The same requirement should apply in rising voltage from 0 to 45 with no visible illumination.

#### **4.2.6 Turn-On and Turn-Off Time:**

The modules shall reach 90% of their full illumination (turn-on) within 75 msec after the application of the nominal operating voltage. The arrows shall not be illuminated (turn-off) within 75 msec after the removal of the nominal operating voltage.

### **4.3 Transient Voltage Protection**

**4.3.1** The arrow on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.

#### 4.4 LED Drive Circuitry

4.4.1 The individual LED light sources shall be wired so that the catastrophic failure of one LED will result in the loss of the light from only that one LED.

#### 4.5 Electronic Noise

The LED arrow and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

#### 4.6 Power Factor (PF) and AC Harmonics

4.6.1 LED arrows shall provide a power factor of 0.90 or greater when operated at nominal operating voltage, and 25°C (77°F).

4.6.2 Total harmonic distortion induced into an ac power line by an LED arrow, at 25°C (77°F) shall not exceed 20 percent.

#### 4.7 Wattage

Proposed LED arrow modules shall be less than or equal to the base wattage shown below at 25 degrees C.

Type	Wattage
12" Red Arrow	6 or less
12" Yellow Arrow	10 or less
12" Green Arrow	7 or less

### 5.0 QUALITY ASSURANCE

#### 5.1 General

##### 5.1.1 Quality Assurance Program

LED arrows shall be manufactured in accordance with a vendor quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance, and (2) production quality assurance.

The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of LED arrows built to meet this specification.

##### 5.1.2 Record Keeping

QA process and test results documentation shall be kept on file for a minimum period of seven years.

### **5.1.3 Conformance**

LED arrows designs not satisfying design qualification testing and the production quality assurance testing performance requirements in Sections 5.3 and 5.4 shall not be labeled, advertised, or sold as conforming to this specification.

## **5.2 Manufacturers Serial Numbers**

Each LED arrow shall be identified by a manufacturer's serial number for warranty purposes.

## **5.3 Production Quality Assurance (QA) Testing**

All new LED arrows shall undergo the following Production Quality Assurance testing prior to shipment. Failure of any LED arrow to meet requirements of these QA tests shall be cause for rejection. QA test results shall be maintained per the requirement of Section 5.1.2.

### **5.3.1 Production Luminous Intensity Test**

All arrows shall be tested for maintained minimum luminous intensity. A single point measurement with a correlation to the intensity requirements of Table 1 in Section 3.0 may be used.

### **5.3.2 Power Factor**

All LED arrows shall be tested for power factor after burn-in per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

### **5.3.3 Current**

All LED arrows shall be measured for the amount of current consumption. The measured current values shall be compared against current values resulting from design qualification measurements in Section 5.4.4.1. Measured current values in excess of 120 percent of the design qualification current values shall be cause for rejection.

### **5.3.4 Visual Inspection**

All LED arrows shall be visually inspected for any exterior physical damage or assembly anomalies.

## **5.4 Design Qualification Testing**

Design qualification testing shall be performed on new LED signal module designs, and when a major design change has been implemented on an existing design. The minimum sample quantity of LED signal arrows shall be as stated for each test. Failure to meet requirements of any of these tests shall be cause for rejection.

Testing shall be performed once every 5 years or when the arrow design or LED technology has been changed. Test data shall be retained by the testing laboratory and the LED arrow manufacturer for a minimum period of 5 years.

#### **5.4.1 Burn-in**

LED arrows shall be energized for a minimum of 24 hours, at 100 percent on-time duty cycle, in an ambient temperature of +60°C (+140°F) before performing any design qualification testing. Any failure within an LED arrow after burn-in shall be cause for rejection.

#### **5.4.2 Maintained Minimum Luminous Intensity**

5.4.2.1 After burn-in, a random sample of six LED arrows shall be tested for maintained minimum luminous intensity at each of the 44 points indicated in Table 1, Section 3.0. These measurements shall be recorded at an ambient temperature of 25°C after the signal has been operated for 60 min.

5.4.2.2 After burn-in, a random sample of six LED arrows shall be tested for maintained minimum luminous intensity. Arrows to be tested shall be mounted in a temperature testing chamber so that the lensed portion of the arrow is outside the chamber and all portions behind the lens are within the chamber.

Red & Green Led Modules shall be tested for luminous output at 74°C, allowing the LED modules to achieve thermal equilibrium for 60 minutes, while the signal is energized at nominal operating voltage, at a 100% duty cycle. A single luminous intensity measurement shall be recorded.

A single point correlation measurement, accounting for measurement variables, shall be made at 25°C (77°F). For Red and green a measurement shall be made at 74°C (165°F) (lens at 49°C (120°F)). The 74°C measurement factored to the 25°C measurement shall be able to be correlated to the requirements of Table 1, Section 3.0. Arrows not meeting this correlation shall be cause for rejection.

#### **5.4.3 Chromaticity**

A sample of two LED arrows shall be measured for chromaticity per the requirements of Section 3.2. A spectroradiometer shall be used for this measurement. The ambient temperature for this measurement shall be +25°C (+77°F).

#### **5.4.4 Electrical**

**5.4.4.1 Current.** A sample of six LED arrows shall be measured for current flow in Amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurements on production modules.

**5.4.4.2 Power Factor (PF).** A sample of six LED arrows shall be measured for power factor per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

**5.4.4.3 Total Harmonic Distortion (THD).** A sample of six LED arrows shall be measured for total harmonic distortion per the requirements of Section 4.6.2. A commercially available total harmonic distortion meter may be used to perform this measurement.

**5.4.4.4 Electronic Noise.** Sample of one LED arrow shall be tested per the requirements of Section 4.6, with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

**5.4.4.5 Low Voltage Turn Off:** After burn-in a sample of six LED arrows shall be measured to meet the low voltage turn-off requirement of section 4.2.5.

**5.4.4.6 Turn-On and Turn-Off Times:** A sample of six LED arrows shall be measured to meet the turn-on and turn-off requirements of section 4.2.6.

**5.4.4.7 Controller Assembly Compatibility.** Due to the low load current draw and high off-state impedance of LED arrow, the following design qualification tests shall be performed to ensure the LED arrow design is compatible and operates properly with load current switches and conflict monitors in NEMA and Type 170 traffic signal control units.

**5.4.4.7.1 Load Switch Compatibility.** A sample of six LED arrows shall be tested for compatibility and proper operation with load current switches. Each LED arrow shall be connected to a variable ac voltage supply. The ac line current into the LED arrow shall be monitored for sufficient current draw to ensure proper load switch operation while the voltage is varied from 80 V rms to 135 V rms. Failure of the current draw to ensure proper load current switch operation shall be cause for rejection.

**5.4.4.7.2 Signal Conflict Monitor Compatibility.** A sample of six LED arrows shall be tested for compatibility and proper operation with signal conflict monitors. Each LED arrow shall be operated from a 135 V ac voltage supply. A 19.5 k $\Omega$  resistor shall be wired in series in the hot line

between the LED monitor and the ac power supply. A single-pole-single-throw switch shall be wired in parallel across the 19.5 k $\Omega$  resistor. A 220 k $\Omega$  shunt resistor shall be wired between the hot line connection and the neutral line connection and the neutral line connection on the LED arrow. Conflict monitor compatibility shall be tested by measuring the voltage decay across the 200 k $\Omega$  shunt resistor as follows: The single-pole-single-throw switch shall be closed, shorting out the 19.5 k $\Omega$  resistor, allowing the ac power supply to illuminate the LED arrow. Next the switch shall be opened, and the voltage across the 220 k $\Omega$  shunt resistor shall be measured for a decay to a value equal to or less than 10V rms within a time period equal to or less than 100 milliseconds. This test shall be repeated a sufficient number of times to ensure testing occurs at the peak of the ac line voltage cycle.

A voltage decay across the 200 k $\Omega$  shunt resistor to a value greater than 10 V rms or a decay time to 10 V rms greater than 100 milliseconds shall be cause for rejection.

**5.4.4.8 Nondestruct Transient Immunity.** A sample of six LED arrows shall be tested for transient immunity using the procedure described in Section 2.1.8, NEMA Standard TS 2-1992.

#### **5.4.5 Environment**

##### **5.4.5.1 Mechanical vibration**

Mechanical vibration testing shall be performed on a sample of three LED arrows per MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

**5.4.6.2 Temperature Cycling.** Temperature cycling shall be performed on a sample of three LED arrows per MIL-STD-883, Test method 1010. The temperature range shall be per Section 2.3. A minimum of 20 cycles shall be performed with a 30-minute transfer time between temperature extremes and a 30-minute dwell time at each temperature. LED arrows test shall be non-operating. Failure of a LED arrow to function properly or any evidence of cracking of the LED arrow's lens or housing after temperature cycling shall be cause for rejection.

**5.4.6.3 Moisture Resistance.** Moisture resistance testing shall be performed on a sample of three LED arrows per NEMA Standard 250-1991 for Type 4 enclosures.

## **6.0 WARRANTY**

**6.1** LED arrows shall be replaced or repaired if it fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery.

**6.2** LED arrows which exhibit luminous intensities less than the minimum values specified in Table 1 Section 3.0 within the first 60 months of the date of delivery shall be replaced or repaired.

## **7.0 INDEPENDENT LAB VERIFICATION**

Independent laboratory reports from Intertek Testing Services ETL Semko shall be supplied to verify modules meet the above requirements.

### III. DETAILED SPECIFICATIONS (Cont'd)

#### LED TRAFFIC SIGNAL MODULES

##### 1.0 PURPOSE

This specification provides the minimum performance requirements for **300 mm (12 in) and 200 mm (8 in) LED traffic signal modules**. This specification refers to definitions and practices described in "Vehicle Traffic Control Signal Heads" published in the *Equipment and Materials Standards of the Institute of Transportation Engineers*, referred to in this document as "VTCSH". The multiple LED light source should be the latest technology available on the market. The LEDs utilized shall be AlInGaP technology for red, amber and yellow indications, or InGaN for green indications.

##### 1.2 Prequalification.

Furnish LED traffic signal lamps that meet or exceed all the requirements of the current Institute of Transportation Engineers (ITE) publication ST-011B Pedestrian Traffic Control Signal Indications (PTCSI) and the current ITE specifications for Vehicle Traffic Control Signal Heads (VTCSH), Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Module, unless otherwise stated in the specifications herein.

The LED Traffic signal lamps provided shall be Gelcore, Dialight or pre-approved equal. All LED lamps shall be the latest model currently in production and new. Equipment no longer being manufactured shall not be accepted even if it meets the following specifications.

To prove reliability, manufacturer must have furnished for installation a minimum of 5,000 of each type and color of product and provide in-state references upon request.

To ensure reliable service and support distributor of products must have physical offices and representatives located within the State of Illinois. Manufacturers will not be permitted to supply product without in-state distribution.

#### 2.0 PHYSICAL AND MECHANICAL REQUIREMENTS

##### 2.1 General

LED traffic signal modules (the module) designed as retrofit replacements for existing signal lamps shall not require special tools for installation. Retrofit replacement LED modules shall fit into existing traffic signal housings built to the VTCSH Standard without modification to the housing.

Installation of a retrofit replacement LED signal module into an existing signal housing shall only require the removal of the following existing components: lens, lamp module and gaskets. The module shall be weather tight and fit securely in the housing and connect directly to existing electrical wiring. Removal of the incandescent lamp reflector is optional.

##### 2.2 LED Signal Module

2.2.1 The retrofit LED module shall be capable of replacing the optical unit.

2.2.2 Tinting (Optional) -The lens shall be tinted or shall use transparent film or materials with similar characteristics.

2.2.3 The LED module lens may be a replaceable part without the need to replace the complete LED module.

### **2.3 Environmental Requirements**

2.3.1 The LED module shall be rated for use in the ambient operating temperature range of -40 to +74°C (-40 to +165°F).

2.3.2 The LED module shall be protected against dust and moisture intrusion as per NEMA Standard 250-1991 requirements, for Type 4 enclosures to protect all internal LED, electronic, and electrical components.

2.3.3 The LED signal module lens shall be UV stabilized.

2.3.4 The lens shall be smooth on the outside and be specifically designed to reduce sun reflections (Sun Phantom).

2.3.5 The LED module must be supplied with an installed gasket.

### **2.4 Construction**

2.4.1 The LED module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply must fit and mount inside the LED module.

2.4.2 The assembly and manufacturing process for the LED assembly shall be designed to assure all internal LED and electronic components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

### **2.5 Materials**

2.5.1 Materials used for the lens and LED module construction shall conform to ASTM specifications where applicable.

2.5.2 Enclosures containing the power supply and electronic components of the LED module shall be made of UL94VO flame retardant materials. The lens of the LED module is excluded from this requirement.

### **2.6 Module Identification**

2.6.1 Each LED module shall be identified on the backside with the manufacturer's name and serial number.

2.6.2 The following operating characteristics shall be identified: nominal operating voltage, power consumption, and Volt-Ampere.

2.6.3 LED modules shall have a prominent and permanent vertical indexing indicator, i.e., UP ARROW or the word UP or TOP, for correct indexing and orientation inside a signal housing.

### **3.0 PHOTOMETRIC REQUIREMENTS**

#### **3.1 Luminous Intensity & Distribution**

3.1.1 The maintained minimum luminous intensity values for LED modules throughout the warranty period, under the operating conditions defined in Sections 2.3.1, 4.2.1 and 5.4.2, and at the end of the warranty period, shall not be less than the values shown in Table 1.

3.1.2 When operating within the temperature range specified in Section 2.3.1 during the warranty period, the maximum luminous intensity for the 8-inch or 12-inch signals shall not exceed 800 candelas for the Red, 1,600 candelas for the Green, and 1,600 candelas for the Yellow.

3.1.3 The optical assembly shall diffuse the light output and provide uniform illumination across the entire surface of circular lenses. Individual LED's shall not be visible to the observer of indications displayed by traffic signal modules.

#### **3.2 Chromaticity**

The measured chromaticity coordinates of LED modules shall be between 500 nm and 650 nm, conforming to the chromaticity requirements of Section 8.04 and Figure 1 of the VTCSH standard.

**Table 1. Maintained Minimum Luminous Intensity for LED Signal Modules  
Candlepower Values (candelas (cd))**

Vertical Angle Down	Horiz. Angle Left & Right	8- inch Signal			12- inch Signal		
		Red	Yellow	Green	Red	Yellow	Green
2.5°	2.5°	133	267	267	339	678	678
	7.5°	97	194	194	251	501	501
	12.5°	57	113	113	141	283	283
	17.5°	25	48	48	77	154	154
7.5°	2.5°	101	202	202	226	452	452
	7.5°	89	178	178	202	404	404
	12.5°	65	129	129	145	291	291
	17.5°	41	81	81	89	178	178
	22.5°	18	37	37	38	77	77
	27.5°	10	20	20	16	32	32
12.5°	2.5°	37	73	73	50	101	101
	7.5°	32	65	65	48	97	97
	12.5°	28	57	57	44	89	89
	17.5°	20	41	41	34	69	69
	22.5°	12	25	25	22	44	44
	27.5°	9	16	16	16	32	32
17.5°	2.5°	16	32	32	22	44	44
	7.5°	14	28	28	22	44	44
	12.5°	10	20	20	22	44	44
	17.5°	9	16	16	22	44	44
	22.5°	6	12	12	20	41	41
	27.5°	4	9	9	16	32	32

## 4.0 ELECTRICAL

### 4.1 General

All wiring and terminal blocks shall meet the requirements of Section 13.02 of the VTCSH Standard. Two secured, color coded, 914 mm (36 in) long 600 V, 16 AWG minimum, jacketed wires, conforming to the National Electrical Code, rated for service at +105°C, are to be provided for electrical connection.

### 4.2 Voltage Range

**4.2.1** LED modules shall operate from a  $60 \pm 3$  cycle AC line power over a voltage range from 80 to 135 V<sub>ac</sub> rms. The current draw shall be sufficient to ensure compatibility and proper triggering and operation of load current switches and conflict monitors in the signal controller that the procuring traffic authority customer has in use.

4.2.2 Nominal operating voltage for all measurements shall be  $120 \pm 3$  Volts rms.

4.2.3 Fluctuations in line voltage over the range of 80 to 135 Vac shall not affect luminous intensity by more than  $\pm 10\%$ .

4.2.4 The LED circuitry shall prevent flickering at less than 100 Hz over the voltage range specified in Section 4.2.1.

#### 4.2.5 Low Voltage Turn Off

There shall be no illumination from the module when the applied voltage is less than 45 volts AC. To test for this condition the unit must first be fully illuminated at the nominal operating voltage. The applied voltage is then reduced to the point that there is no illumination. This point must be greater than 45 volts AC. The same requirement should apply in rising voltage from 0 to 45 with no visible illumination.

#### 4.2.6 Turn-On and Turn-Off Time:

The modules shall reach 90% of their full illumination (turn-on) within 100 ms ( $\pm 10\%$ ) after the application of the nominal operating voltage. The LED modules shall not be illuminated (turn-off) within 100 ms ( $\pm 10\%$ ) after the removal of the nominal operating voltage.

### 4.3 Transient Voltage Protection

4.3.1 The LED module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in Section 2.1.6, NEMA Standard TS-2, 1992.

### 4.4 LED Drive Circuitry

4.4.1 The individual LED light sources shall be wired so that the catastrophic failure of one LED, will result in the loss of the light from only that one LED.

4.4.2 The power supply must be current regulated.

### 4.5 Electronic Noise

The LED module and the associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

#### 4.6 Power Factor (PF) and AC Harmonics

4.6.1 LED modules shall provide a power factor of 90% or greater when operated at nominal operating voltage and at  $T = 25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ ).

4.6.2 Total harmonic distortion induced into an AC power line by an LED signal module, operated at nominal operating voltage, at  $T = 25^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ ) shall not exceed 20 %.

#### 4.7 Wattage

Proposed LED modules shall be less than or equal to the base wattage shown below at 25 degrees C.

Type	Wattage
12" Red Ball	10 or less
12" Yellow Ball	22 or less
12" Green Ball	14 or less
8" Red Ball	6 or less
8" Yellow Ball	14 or less
8" Green Ball	8 or less

### 5.0 QUALITY ASSURANCE

#### 5.1 General

##### 5.1.1 Quality Assurance Program

LED modules shall be manufactured in accordance with a vendor quality assurance (QA) program. The QA program shall include two types of quality assurance: (1) design quality assurance, and (2) production quality assurance.

The production quality assurance shall include statistically controlled routine tests to ensure minimum performance levels of LED modules built to meet this specification.

##### 5.1.2 Record Keeping

QA process and test result documentation shall be kept on file for a minimum period of seven (7) years.

### **5.1.3 Conformance**

LED module designs not satisfying design qualification testing and the production quality assurance testing performance requirements in Sections 5.3 and 5.4 shall not be labeled, advertised, or sold as conforming to this specification.

### **5.2 Manufacturers' Serial Numbers**

Each LED module shall be identified by a manufacturer's serial number for warranty purposes.

### **5.3 Production Quality Assurance (QA) Testing**

All new LED modules shall undergo the following Production Quality Assurance testing prior to shipment. Failure of any LED module to meet requirements of these QA tests shall be cause for rejection. QA test results shall be maintained per the requirement of Section 5.1.2.

#### **5.3.1 Module Burn-In**

All LED modules or the electronic circuitry sub-assemblies, including all LEDs, shall be energized for a minimum of 24 hours, at 100% on-time duty cycle, in an ambient temperature of 60°C (+140°F).

#### **5.3.2 Maintained Minimum Luminous Intensity**

All LED modules shall be tested for maintained minimum luminous intensity after burn-in. A single point measurement with a correlation to the intensity requirements of Table 1 in Section 3.0 may be used. The LED module shall be operated at nominal operating voltage and at an ambient temperature of 25°C (77°F).

#### **5.3.3. Power Factor**

All LED modules shall be tested for power factor after burn-in per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

#### **5.3.4 Current**

All LED modules shall be measured for current flow in Amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements in Section 5.4.4.1. Measured current values in excess of 120% of the design qualification current values shall be cause for rejection.

### **5.3.5 Visual Inspection**

All LED modules shall be visually inspected for any exterior physical damage or assembly anomalies.

## **5.4 Design Qualification Testing**

Design qualification testing shall be performed on new LED module designs, and when a major design change has been implemented on an existing design. The minimum sample quantity of LED modules shall be as stated for each test. Failure to meet requirements of any of these tests shall be cause for rejection.

Testing shall be performed once every five (5) years or when the module design or LED technology has been changed. Test data shall be retained by the testing laboratory and the LED module manufacturer for a minimum period of five (5) years.

### **5.4.1 Burn-In**

LED modules shall be energized for a minimum of 24 hours, at 100% on-time duty cycle, in an ambient temperature of +60°C (+140°F) before performing any design qualification testing.

### **5.4.2 Maintained Minimum Luminous Intensity**

**5.4.2.1** After burn-in, a random sample of six LED modules shall be tested for maintained minimum luminous intensity at each of the 44 points indicated in Table 1, Section 3.0. These measurements shall be recorded at an ambient temperature of 25°C after the signal has been operated for 60 min.

**5.4.2.2** After burn-in, a random sample of six (6) LED modules shall be tested for maintained minimum luminous intensity. Signals to be tested shall be mounted in a temperature testing chamber so that the lensed portion of the signal is outside the chamber and all portions behind the lens are within the chamber at a temperature of 74°C (165°F). The air temperature in front of the lens of the signal lens shall be maintained at a minimum of 49°C (120°F) during all tests.

Red and green LED modules shall be tested for luminous output at 74°C, allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 100% duty cycle, a single luminous intensity measurement shall be recorded.

Yellow LED modules shall be tested for luminous output at 25°C, allowing the modules to achieve thermal equilibrium for 60 minutes, while the modules are energized at nominal operating voltage, at a 8.3% (or 1/12) duty cycle or (5 s On/55 s Off).

A single point correlation measurement, accounting for measurement variables, shall be made at 25°C (77°F). For Red and green a measurement shall be made at 74°C (165°F) (lens at 49°C (120°F)). The 74°C measurement factored to the 25°C measurement shall be able to be correlated to the requirements of Table 1, Section 3.0. LED modules not meeting this correlation shall be cause for rejection.

#### **5.4.3 Chromaticity**

A sample of two LED modules shall be measured for chromaticity per the requirements of Section 3.4.2. A spectroradiometer shall be used for this measurement. The ambient temperature for this measurement shall be +25°C (+77°F).

#### **5.4.4 Electrical**

##### **5.4.4.1 Current.**

A sample of six LED modules shall be measured for current flow in Amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurements on production modules.

##### **5.4.4.2 Power Factor (PF).**

A sample of six (6) LED modules shall be measured for power factor per the requirements of Section 4.6.1. A commercially available power factor meter may be used to perform this measurement.

**5.4.4.3 Total Harmonic Distortion (THD).** A sample of six LED modules shall be measured for total harmonic distortion per the requirements of Section 4.6.2. A commercially available total harmonic distortion meter may be used to perform this measurement.

**5.4.4.4 Electronic Noise.** A sample of one LED modules shall be tested per the requirements of Section 4.6, with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

**5.4.4.5 Controller Assembly Compatibility.** Due to the low load current draw and high off-state impedance of LED modules, the following design qualification tests shall be performed to ensure the module design is compatible and operates properly with load current switches and conflict monitors in NEMA and Type 170 traffic signal control units.

**5.4.4.5.1 Load Switch Compatibility.** A sample of six LED modules shall be tested for compatibility and proper operation with load current switches. Each LED module shall be connected to a variable AC voltage supply. The AC line current into the LED module shall be monitored for sufficient current draw to ensure proper load switch operation while the voltage is varied from 80 V rms to 135 V rms. Failure of the current draw to ensure proper load current switch operation shall be cause for rejection.

**5.4.4.5.2 Signal Conflict Monitor Compatibility.** A sample of six (6) LED modules shall be tested for compatibility and proper operation with signal conflict monitors. Each LED module shall be operated from a 135 V ac voltage supply. A 19.5 k $\Omega$  resistor shall be wired in series in the hot line between the LED module monitor and the ac power supply. A single-pole-single-throw switch shall be wired in parallel across the 19.5 k $\Omega$  resistor. A 220 k $\Omega$  shunt resistor shall be wired between the hot line connection and the neutral line connection and the neutral line connection on the LED module. Conflict monitor compatibility shall be tested by measuring the voltage decay across the 200 k $\Omega$  shunt resistor as follows: The single-pole-single-throw switch shall be closed, shorting out the 19.5 k $\Omega$  resistor, allowing the AC power supply to illuminate the LED module. Next, the switch shall be opened and the voltage across the 220 k $\Omega$  shunt resistor shall be measured for a decay to a value equal to or less than 10V rms within a time period equal to or less than 100 milliseconds. This test shall be repeated a sufficient number of times to ensure testing occurs at the peak of the AC line voltage cycle.

**5.4.4.6 Nondestruct Transient Immunity.** A sample of six LED modules shall be tested for transient immunity using the procedure described in Section 2.1.8, NEMA Standard TS 2-1992.

#### **5.4.5 Environmental**

**5.4.5.1 Temperature Cycling.** Temperature cycling shall be performed on a sample of three LED modules per MIL-STD-883, Test method 1010. The temperature range shall be per Section 2.3. A minimum of 20 cycles shall be performed with a 30-minute transfer time between temperature extremes and a 30-minute dwell time at each temperature. LED modules under test shall be non-operating. Failure of a LED module to function properly or any evidence of cracking of the LED module lens or housing after temperature cycling shall be cause for rejection.

**5.4.5.2 Moisture Resistance.** Moisture resistance testing shall be performed on a sample of three LED modules per NEMA Standard 250-1991 requirements for Type 4 enclosures.

#### **5.4.5.3 Mechanical Vibration**

Mechanical vibration testing shall be performed on a sample of three LED modules per MIL-STD-883, Test Method 2007, using three 4-minute cycles along each x, y, and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

### **6.0 WARRANTY**

#### **6.1 Warranty**

**6.1.1** LED modules shall be replaced or repaired if an LED module fails to function as intended due to workmanship or material defects within the first 60 months from the date of delivery.

**6.1.2** LED modules which exhibit luminous intensities less than the minimum values specified in Table 1 Section 3.0 within the first 60 months of the date of delivery shall be replaced or repaired.

### **7.0 INDEPENDENT LAB VERIFICATION**

Independent laboratory reports from Intertek Testing Services ETL Semko shall be supplied to verify modules meet the above requirements.

### III. DETAILED SPECIFICATIONS (Cont'd)

#### LED TRAFFIC SIGNAL MODULES

##### 1.0 PURPOSE

The purpose of this specification is to provide the minimum performance requirements for the **LED "walking person" and "hand" icon pedestrian signal modules** (hereafter called module or modules).

This specification refers to definitions and practices described in "Pedestrian Traffic Control Signal Indications" published in the *Equipment and Materials Standards of the Institute of Transportation Engineers*, referred to in this document as "PTCSP" and in the Manual on Uniform Traffic Control Devices (MUTCD). This specification applies to modules purchased after the effective date of these specifications.

##### 1.3 Prequalification.

Furnish LED traffic signal lamps that meet or exceed all the requirements of the current Institute of Transportation Engineers (ITE) publication ST-011B Pedestrian Traffic Control Signal Indications (PTCSI) and the current ITE specifications for Vehicle Traffic Control Signal Heads (VTCSH), Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Module, unless otherwise stated in the specifications herein.

The LED Pedestrian signal lamps provided shall be Gelcore, Dialight or pre-approved equal. All LED lamps shall be the latest model currently in production and new. Equipment no longer being manufactured shall not be accepted even if it meets the following specifications.

To prove reliability, manufacturer must provide in-state references upon request.

To ensure reliable service and support distributor of products must have physical offices and representatives located within the State of Illinois. Manufacturers will not be permitted to supply product without in-state distribution.

##### 2.0 PHYSICAL AND MECHANICAL REQUIREMENTS

###### 2.1 General

Modules designed as retrofit replacements for existing pedestrian signal indication lamps shall not require special tools for installation. Retrofit replacement modules shall fit into existing pedestrian signal housings built for the PTCSI sizes stated in Section 1 of the "walking person" and "hand" icon pedestrian signal indication Standard without modification to the housing. See PTCSI 4.2.1 for housing sizes.

Installation of a retrofit replacement module into an existing pedestrian signal housing shall only require the removal of the existing optical unit components, i.e., lens, lamp module, gaskets, and reflector; shall be weather tight and fit securely in the housing; and shall connect directly to existing electrical wiring.

***12 INCH LED SIGNAL FACE RETROFIT, WALK***

The LED signal face shall have the international Walk symbol (Person Walking – Color: Lunar White).

Currently only the following models are approved for use provided that they meet the minimum specification list below:

GELcore	Model PS6-WFM3-01A (Filled Person)
Dialight	Model 430-7771-001 (Filled Person)

The LED assembly shall conform to the following minimum specifications:

***LENS:*** 12" X 12", Hard Coated for Abrasion Resistance, UV Stabilized Dome

***LEDS:*** Interconnected to minimize the effect of single LED failures, Nominal Wattage White: 7 W or less.

**Product Warranty:** 5-Year Replacement (Materials, Workmanship, and Intensity)

The assembly shall be capable of operating from 80 to 135 VAC with less than 10% variation in intensity, shall have an operating temperature range of -40° to 74° C, and shall be sealed and highly resistant to water intrusion.

The assembly shall be compatible with signal control equipment per NEMA TS-2, NEMA TS-1 standards, and include transient voltage protection and fusing to withstand high-repetition noise transients and low repetition high energy transients per NEMA standard 1992 per ITE VTCSH – STD Part 2.

***12 INCH LED SIGNAL FACE RETROFIT, DON'T WALK***

The LED signal face shall have the international Hand symbol (Upraised Hand – Color: Portland Orange).

Currently only the following models are approved for use provided that they meet the minimum specification list below:

GELcore	Model PS6-PFH1-01A (Full Hand)
Dialight	Model 430-5770-001 (Full Hand)

The LED assembly shall conform to the following minimum specifications:

*LENS:* 12" X 12", Hard Coated for Abrasion Resistance, UV Stabilized Dome

*LEDS:* Interconnected to minimize the effect of single LED failures, Nominal Wattage: 8.1 W or less.

Product Warranty: 5-Year Replacement (Materials, Workmanship, and Intensity)

The assembly shall be capable of operating from 80 to 135 VAC with less than 10% variation in intensity, shall have an operating temperature range of -40° to 74° C, and shall be sealed and highly resistant to water intrusion.

The assembly shall be compatible with signal control equipment per NEMA TS-2, NEMA TS-1 standards, and include transient voltage protection and fusing to withstand high-repetition noise transients and low repetition high-energy transients per NEMA standard 1992 per ITE VTCSH – STD Part 2.

***12 INCH LED SIGNAL FACE RETROFIT, WALK/DON'T WALK COMBINATION***

The LED signal face shall have the international Hand and Person symbols (Upraised Hand – Color: Portland Orange, Walking Person – Color: Lunar White).

Currently only the following models are approved for use provided that they meet the minimum specification list below:

GELcore	Model PS6-CFL1-01A (Full Hand and Full Person)
Dialight	Model 430-6772-001 (Full Hand and Full Person)

The LED assembly shall conform to the following minimum specifications:

*LENS:* 12" X 12", Hard Coated for Abrasion Resistance, UV Stabilized Dome

*LEDS:* Interconnected to minimize the effect of single LED failures, Nominal Wattage: 9 W or less for each symbol.

Product Warranty: 5-Year Replacement (Materials, Workmanship, and Intensity)

The assembly shall be capable of operating from 80 to 135 VAC with less than 10% variation in intensity, shall have an operating temperature range of -40° to 74° C, and shall be sealed and highly resistant to water intrusion.

The assembly shall be compatible with signal control equipment per NEMA TS-2, NEMA TS-1 standards, and include transient voltage protection and fusing to withstand high-repetition noise transients and low repetition high-energy transients per NEMA standard 1992 per ITE VTC SH – STD Part 2.

**IV. BID CONTRACT FORM-A-**

The Contractor offers to supply the following materials to the Village at the proposed unit prices, as listed below:

<b>Equipment</b>	<b>Size and Type of Bulb/Signal</b>	<b>Number of Existing Units to be Replaced</b>	<b>UNIT Cost</b>	<b>Extended Cost</b>
<b>Pedestrian Signals Walk/Don't Walk Combination</b>	8-inch signal	--		
	12-inch signal	95	\$ 103.40	\$ 9823.00
<b>Traffic Balls</b>	8-inch red	--		
	8-inch green	--		
	8-inch yellow	--		
	12-inch red	121	\$ 37.40	\$ 4525.40
	12-inch green	121	\$ 79.20	\$ 9583.20
	12-inch yellow	121	\$ 46.20	\$ 5082.00
<b>Traffic Arrows</b>	8-inch red	--		
	8-inch green	--		
	8-inch yellow	--		
	12-inch red	4	\$ 38.50	\$ 154.00
	12-inch green	45	\$ 53.90	\$ 2425.50
	12-inch yellow	40	\$ 39.60	\$ 1584.00
<b>TOTAL BID</b>				<b>\$33,177.10</b>

***16 INCH LED SIGNAL FACE RETROFIT, WALK/DON'T WALK COMBINATION***

The LED signal face shall have the international Hand and Person symbols (Upraised Hand – Color: Portland Orange, Walking Person – Color: Lunar White).

Currently only the following models are approved for use provided that they meet the minimum specification list below:

GELcore      Model PS7-CFC1-01A (Full Hand and Full Person Side by Side)  
Dialight      Model 430-6473-001 (Full Hand and Full Person Side by Side)

The LED assembly shall conform to the following minimum specifications:

*LENS:* 16" X 17", Hard Coated for Abrasion Resistance, UV Stabilized Dome

*LEDS:* Interconnected to minimize the effect of single LED failures, Nominal Wattage: 9 W or less for each symbol.

Product Warranty: 5-Year Replacement (Materials, Workmanship, and Intensity)

The assembly shall be capable of operating from 80 to 135 VAC with less than 10% variation in intensity, shall have an operating temperature range of -40° to 74° C, and shall be sealed and highly resistant to water intrusion.

The assembly shall be compatible with signal control equipment per NEMA TS-2, NEMA TS-1 standards, and include transient voltage protection and fusing to withstand high-repetition noise transients and low repetition high-energy transients per NEMA standard 1992 per ITE VTCSH – STD Part 2.

**MUNICIPAL REFERENCE LIST**

Municipality: Village of Lombard  
Address: 255 E. Wilson Ave. Lombard, IL 60148  
Telephone # 630-620-5740  
Contact Name John Johnson

Municipality Village of Westmont  
Address: 31 W. Quincy St. Westmont, IL 60559  
Telephone # 630-829-4453  
Contact Name Steve May

Municipality: City of Highland Park  
Address: 1150 Halfday Rd, Highland Park, IL 60035  
Telephone # 847-432-0800  
Contact Name Bob McCraren

Municipality: City of Naperville  
Address: 400 S. Eagle St. Naperville, IL 60566  
Telephone # 630-548-2958  
Contact Name Andy Hynes

Municipality: Village of Lansing  
Address: 3300 171st St. Lansing, IL 60438  
Telephone # 708-895-7190  
Contact Name Peter Krilich

Municipality: Village of Oak Park  
Address: 123 Madison St. Oak Park, IL 60302  
Telephone # 708-358-5739  
Contact Name Bill Madlener

Municipality City of Elmhurst  
Address: 985 S. Riverside Dr. Elmhurst, IL 60126  
Telephone # 630-530-3085  
Contact Name Scott Gunderson

Municipality Village of Bolingbrook  
Address: 299 Canterbury Bolingbrook, IL 60440  
Telephone # 630-226-8831  
Contact Name Jim Frasco

**BIDDER'S CERTIFICATION** (page 1 of 2)

**IV. BID/CONTRACT FORM-B-**

**\*\*\*THIS BID WHEN ACCEPTED AND SIGNED BY AN AUTHORIZED SIGNATORY OF THE VILLAGE OF DOWNERS GROVE SHALL BECOME A CONTRACT BINDING UPON BOTH PARTIES.**

**Entire Block Must Be Completed When A Submitted Bid Is To Be Considered For Award**

**BIDDER:**

Traffic Control Corporation  
Company Name

780 W. Belden Ave Suite D  
Street Address of Company

Addison, IL 60101  
City, State, Zip

630-543-1300  
Business Phone

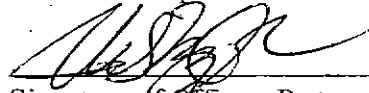
630-458-0542  
Fax

Date: March 10, 2005

emcchrystal@trafficcontrolcorp.com  
Email Address

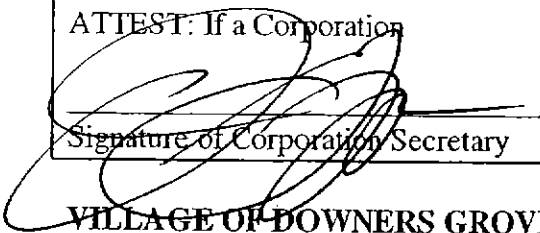
Ed McChrystal  
Contact Name (Print)

630-768-5857  
24-Hour Telephone

  
Signature of Officer, Partner or  
Sole Proprietor

John S. Lizzadro, President  
Print Name & Title

ATTEST: If a Corporation

  
Signature of Corporation Secretary

**VILLAGE OF DOWNERS GROVE:**

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

ATTEST:

\_\_\_\_\_  
Signature of Village Clerk

\_\_\_\_\_  
Date

In compliance with the specifications, the undersigned offers and agrees, if this Bid is accepted within 90 calendar days from the date of opening, to furnish any or all of the services upon which prices are quoted, at the price set opposite each item, delivered at the designated point within the time specified above.

(a) **Corporation**

The Supplier is a corporation organized and existing under the laws of the State of Illinois, which operates under the Legal name of Traffic Control Corporation, and the full names of its Officers are as follows:

President: John S. Lizzadro Jr.

Secretary: John Lizzadro Sr.

Treasurer: John Lizzadro Sr.

and it does have a corporate seal. (In the event that this bid is executed by other than the President, attach hereto a certified copy of that section of Corporate By-Laws or other authorization by the Corporation which permits the person to execute the offer for the corporation.)

(b) **Partnership**

Signatures and Addresses of All Members of Partnership:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The partnership does business under the legal name of:

\_\_\_\_\_ which name is registered with the office of \_\_\_\_\_ in the state of \_\_\_\_\_.

(c) **Sole Proprietor**

The Supplier is a Sole Proprietor whose full name is \_\_\_\_\_

and if operating under a trade name, said trade name is \_\_\_\_\_ which name is registered with the office of \_\_\_\_\_ in the state of \_\_\_\_\_.

In compliance with Sections 720 ILCS 5/33E-3 and 720 ILCS 5/33E-4 of the Illinois Criminal Code, every bid submitted to the Village of Downers Grove shall have a Bidder's Certificate signed by the contractor submitting the bid stating that the contractor is not barred from bidding this contract as a result of violations of Section 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4; and is not delinquent in payment of any tax administered by the Department of Revenue.

**BIDDER'S CERTIFICATION**

Bidder, Traffic Control Corporation, hereby certifies that  
(Name of Bidder)

it is not barred from bidding on the contract for:

Village of Downers Grove Bid 05-2005 LED Traffic Signal Modules

(Description of Contract)

as a result of a violation of either 720 ILCS 5/33E-3 or 720 ILCS 5/33E-4.

Bidder further certifies that it is not delinquent in the payment of any tax administered by the Department of Revenue, or that Bidder is contesting its liability for the tax delinquency or the amount of a tax delinquency in accordance with the procedures established by the appropriate Revenue Act. Bidder further certifies that if it owes any tax payment(s) to the Department of Revenue, Bidder has entered into an agreement with the Department of Revenue for the payment of all such taxes that are due, and Bidder is in compliance with the agreement.

BY: [Signature]  
Bidder's Authorized Agent

3	6	-	2	0	5	9	0	6	6
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**FEDERAL TAXPAYER IDENTIFICATION NUMBER**

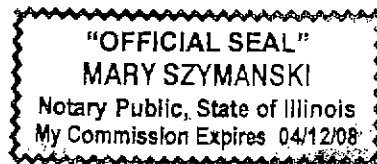
or \_\_\_\_\_  
Social Security Number

Subscribed and sworn to before me

this 11 day of MARCH, 2005.

Mary Szymanski  
Notary Public

Page 2 of Bidder's Certification  
(Fill Out Applicable Paragraph Below)



# ACORD. CERTIFICATE OF INSURANCE

DATE (MM/DD/YY)

03/07/05

PRODUCER

ROBERT B. McMANUS, INC.  
111 W JACKSON BLVD, STE 1134  
CHICAGO, IL 60604  
(312) 786-9090 FAX: 341-1133

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY  
A QBE Insurance Corp.

COMPANY  
B ST. PAUL INSURANCE

COMPANY  
C Everest National Ins

COMPANY  
D AMERICAN ZURICH

INSURED

TRAFFIC CONTROL CORPORATION  
780 W. Belden Ave.  
Addison, IL 63026

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CD LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS
A	GENERAL LIABILITY <input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR <input type="checkbox"/> OWNERS & CONTRACTOR'S PROT	FCGC 700248-02 XCU Coverage	08/25/04	08/25/05	GENERAL AGGREGATE \$2,000,000
					PRODUCTS - COMP/OP AGG \$1,000,000
					PERSONAL & ADV INJURY \$1,000,000
					EACH OCCURRENCE \$1,000,000
					FIRE DAMAGE (Any one fire) \$ 100,000
					MED EXP (Any one person) \$ 5,000
B	AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input checked="" type="checkbox"/> ALL OWNED AUTOS <input checked="" type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS <input checked="" type="checkbox"/> NON-OWNED AUTOS	CK 01202527	08/25/04	08/25/05	COMBINED SINGLE LIMIT \$1,000,000
					BODILY INJURY (Per person) \$
					BODILY INJURY (Per accident) \$
					PROPERTY DAMAGE \$
	GARAGE LIABILITY <input type="checkbox"/> ANY AUTO				AUTO ONLY - EA ACCIDENT \$
					OTHER THAN AUTO ONLY: \$
					EACH ACCIDENT \$
					AGGREGATE \$
D	EXCESS LIABILITY <input checked="" type="checkbox"/> UMBRELLA FORM <input type="checkbox"/> OTHER THAN UMBRELLA FORM	AUC 2973474-02	08/25/04	08/25/05	EACH OCCURRENCE \$10,000,000 AGGREGATE \$10,000,000
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY THE PROPRIETOR/PARTNERS/EXECUTIVE OFFICERS ARE: <input checked="" type="checkbox"/> INCL <input type="checkbox"/> EXCL	#5617000041041 (CNA Policy)	02/01/05	02/01/06	<input checked="" type="checkbox"/> STATUTORY LIMITS
					EACH ACCIDENT \$1,000,000
					DISEASE - POLICY LIMIT \$1,000,000
					DISEASE - EACH EMPLOYEE \$1,000,000
	OTHER Professional Liability	#CPA 114050984	12/17/04	12/17/05	Each Claim \$5,000,000 Aggregate \$5,000,000 Retention \$ 50,000

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS  
officers, employees and volunteers. A Waiver of Subrogation applies in favor of the additional insured under Workers Compensation. Coverage afforded the additional insured is primary and non-contributory. \*\*For Bidding Purposes\*\*

CERTIFICATE HOLDER

Village of Downers Grove

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL endeavor to MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE  
*Robert B. McManus*

**Federal Insurance Company**

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233 South Wacker Drive  
Sears Tower – Suite 4700  
Chicago, IL 60606

March 8, 2005

Attention: Village of Downers Grove

Re: Traffic Control Corporation

Dear Sir or Madam:

Traffic Control Corporation is a highly valued client of Thilman & Filippini and Federal Insurance Company. As such, we highly recommend them for your anticipated project.

Federal Insurance Company has been the surety for Traffic Control Corporation since 2003. They are licensed in all 50 states and carry an A.M. Best Policyholder's Rating of "A++", with a Financial Rating of XV. The Federal Insurance Company possesses a U.S. Treasury listing of \$575,194,000.

Accordingly, we would consider issuing a bond for our client on the upcoming project listed above, subject to a favorable underwriting review, which includes, but is not limited to a review of contract terms and conditions, and project financing.

Regards,

*Pam J. Klasen*

Pam J. Klasen  
Attorney-In-Fact

/pjk



POWER OF ATTORNEY

Federal Insurance Company  
Vigilant Insurance Company  
Pacific Indemnity Company

Attn: Surety Department  
15 Mountain View Road  
Warren, NJ 07059

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Susan K. Symons, Pam J. Klasen, Art Pedraza, Ed L. Hart, Tom Thilman and John Atkinson of Chicago, Illinois

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 15th day of June, 2004

*Kenneth C. Wendel*  
Kenneth C. Wendel, Assistant Secretary

*Frank E. Robertson*  
Frank E. Robertson, Vice President

STATE OF NEW JERSEY }  
County of Somerset } ss.

On this 15th day of June, 2004, before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with Frank E. Robertson, and knows him to be Vice President of said Companies; and that the signature of Frank E. Robertson, subscribed to said Power of Attorney is in the genuine handwriting of Frank E. Robertson, and was thereto subscribed by authority of said By-Laws and in deponent's presence.



MICHELE R. MCKENNA  
Notary Public State of New Jersey  
No. 129941  
Commission Expires Sept. 25, 2004

*Michele R. McKenna*  
Notary Public

CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U. S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U. S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 8th day of March- 2005



*Kenneth C. Wendel*  
Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY  
Telephone (908) 903-3485 Fax (908) 903-3656 e-mail: surety@chubb.com