

LEASE PURCHASE AGREEMENT

THIS AGREEMENT is made and entered into by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado (the “City”) and **FRONT RANGE FIRE APPARATUS, LIMITED**, a Colorado Corporation whose address is 7600 Miller Ct., Frederick, CO 80530 (“Contractor”).

RECITALS:

1. The City desires to obtain a Pierce Velocity 100’ Platform and 2 Pierce Velocity Pumpers and associated equipment (cumulatively, the “Equipment”), and Contractor desires to provide that Equipment to the City.

2. The City intends to finance and pay for the acquisition of the Equipment through a separate lease-purchase agreement (the “LPA”) between the City and JP Morgan Chase Bank, N.A. (the “Bank”).

AGREEMENT:

For and in consideration of the agreements contained herein and subject to the terms and conditions stated, in this Agreement, the parties agree as follows:

The recitals set forth above are incorporated herein as set forth in their entirety.

1. **FORM OF AGREEMENT.** This Agreement shall consist of the terms and conditions stated in the following numbered Articles, together with those exhibits or attachments that are referenced and incorporated in such Articles. In the event that any conflict between the terms and conditions contained in this document and those contained in any exhibits or attachments shall occur, the terms and conditions of these numbered Articles shall be controlling.

2. **COORDINATION AND LIAISON:** Contractor agrees that during the term of this Agreement it shall fully coordinate the performance of this Agreement with the City, including the Executive Director of the Department of Transportation and Infrastructure (“Manager”) or as otherwise directed by the City. Contractor understands that the Manager or designee is the City’s representative under this Agreement through whom Contractor obligations performed under this Agreement shall be coordinated.

3. **EQUIPMENT, ACCEPTANCE AND WARRANTIES TO BE PROVIDED.**

A. Contractor shall provide to the City the Equipment and Warranties listed and described on **Exhibit A** attached hereto (hereinafter referred to as the “Equipment” and “Warranties”).

B. It is understood and agreed that the Equipment and Warranties associated with this Agreement that are being provided to the City hereunder are also routinely provided to nongovernmental customers on the same terms and conditions that were offered to the City and are agreed to by the City in this Agreement.

C. Upon delivery and final installation of the Equipment, the City will test and evaluate same to ensure that it conforms, in the City’s reasonable judgment, to the specifications outlined in the exhibits. If the Equipment does not conform, the City will so notify Contractor in

writing within sixty (60) days. Contractor will, at its expense, repair or replace the nonconforming product within fifteen (15) days after receipt of the City's notice of deficiency. The foregoing procedure will be repeated until the City accepts or finally rejects the product, in whole or part, in utilizing reasonable discretion. In the event that the Equipment contains a defect or nonconformity not apparent on examination, the City reserves the right to repudiate acceptance. In the event that the City finally rejects the Equipment, or repudiates acceptance of it, Contractor will refund to the City all fees received with respect to the rejected product, and the City will cease using the Equipment and return the Equipment to the Contractor.

D. The Equipment shall be delivered to DFD Fleet Management 5440 Roslyn Street, Building B Denver, CO 80216.

4. **SPECIAL PURCHASING TERMS AND CONDITIONS:** In addition to all other terms and conditions stated in this Agreement, Contractor shall comply with the following special purchasing terms and conditions:

A. Pricing is F.O.B. Denver, CO, delivered to the City facilities as set out in a separate and subsequent writing. Contractor agrees to bear all risk of loss, injury, or destruction of goods and materials ordered as a result of this Agreement which occur prior to delivery to the City; and such loss, injury or destruction shall not release the Contractor from any obligation hereunder.

B. Contractor agrees to bear all risk of loss, injury, or destruction of goods and materials ordered as a result of this Agreement which occur prior to delivery to the City; and such loss, injury or destruction shall not release Contractor from any obligation hereunder. Thereafter, risk of loss shall pass to the City and Bank as further described in the LPA.

C. Contractor agrees to furnish, upon the written request of the City, any additional information needed to substantiate or clarify the design and/or performance characteristics of the Equipment.

D. Contractor Invoices must include the following:

- (1) City contract control number.
- (2) Items listed individually.
- (3) Invoice number and date.
- (4) Requesting department name and "ship to" address.
- (5) Payment terms.

5. **TERM.** The term of this Agreement shall commence upon April 1, 2022, and expire on March 31, 2025.

6. **COMPENSATION.**

A. It is understood and agreed that the City has elected to lease/purchase/finance the Equipment and Warranties through the LPA. The City and Bank have also entered into an escrow agreement that together with the LPA provide for payment to the Contractor of the maximum amount stated herein subject to the procedure set out in the LPA. The

Contractor's performance under this Agreement is expressly conditioned upon funding of the escrow agreement and proper payment as set out herein.

B. The total compensation payable to Contractor for acquiring and delivering the Equipment together with the Warranties shall be the amount of **TWO MILLION EIGHT HUNDRED THIRTY-TWO THOUSAND NINE HUNDRED THIRTY-FIVE DOLLARS (\$2,832,935.00)** (the "Purchase Amount"), payable directly to the Contractor by the escrow company. Payment by the escrow company shall be initiated after delivery of the Equipment, examination of the Equipment and the City's issuance of an Acceptance Certificate. Payment shall be made by the escrow company until the Purchase Price is paid in full. The City may also elect to prepay the cost of the Equipment prior to its delivery, in which case payment shall be made from escrow to the Contractor. In that event, the Contractor shall provide security in the form of a bond acceptable to the Bank and the City and the City shall receive a prepayment discount of \$87,000.00 for the Equipment. The total compensation payable to Contractor for acquiring and delivering the Equipment together with the Warranties with the prepaid amount shall be **TWO MILLION SEVEN HUNDRED FORTY-FIVE THOUSAND NINE HUNDRED THIRTY-FIVE DOLLARS (\$2,745,935.00)** (the "Purchase Amount"). Title to the Equipment shall vest with the Bank upon payment of the Purchase Amount to Contractor. In the interim, beneficial use of the Equipment and Warranties shall remain with the City.

C. The total compensation payable by the City to Contractor under this Agreement for the Equipment and Warranties is Zero Dollars (\$0.00) (the "Contract Amount"). However, the parties recognize and agree that Contractor will be paid the Purchase Price by payment directly from the escrow company and the Bank.

D. It is understood and agreed that any payment obligation of the City hereunder, whether direct or contingent, shall extend only to funds appropriated by the Denver City Council for the purpose of this Agreement, encumbered for the purpose of the Agreement and paid into the Treasury of the City. Contractor acknowledges that (a) the City does not by this Agreement, irrevocably pledge present cash reserves for payments in future fiscal years, and (b) this Agreement is not intended to create a multiple-fiscal year direct or indirect debt or financial obligation of the City. The parties agree that Contractor is furnishing custom designed and built equipment for the City and the City agrees to perform to ensure Contractor is paid the Purchase Price.

7. **TIME IS OF THE ESSENCE:** The parties agree that in the performance of the terms, conditions, and requirements of this Agreement by both parties, time is of the essence.

8. **STATUS OF CONTRACTOR:** It is understood and agreed by and between the parties that the status of Contractor shall be that of an independent contractor and it is not intended, nor shall it be construed, that Contractor or any employee or subconsultant is an employee, officer, or agent of the City under Chapter 18 of the Denver Revised Municipal Code for purposes of unemployment compensation, workers' compensation, or for any purpose whatsoever.

9. **TERMINATION OF AGREEMENT:** The City may terminate this Agreement at any time on thirty (30) days' notice if Contractor is in breach or default of the Agreement or if the underlying project or activity is canceled; however, Contractor has the right to cure any breach or default within seven days of Contractor receiving notice of breach or default. The City has the right to terminate this Agreement without cause on thirty (30) days written notice if that cancellation occurs

prior to Contractor ordering the equipment. In the event this Agreement is cancelled or terminated by the City without cause, before completion, Company may charge a cancellation fee. The following charge schedule based on costs incurred may be applied: (a) 10% of the Purchase Price after order is accepted and entered by Company; (b) 20% of the Purchase Price after completion of approval drawings, and; (c) 30% of the Purchase Price upon any material requisition. The cancellation fee will increase accordingly as costs are incurred as the order progresses through engineering and into manufacturing. Company endeavors to mitigate any such costs through the sale of such Product to another purchaser; however, Customer shall remain liable for the difference between the Purchase Price and, if applicable, the sale price obtained by Company upon sale of the Product to another purchaser, plus any costs incurred by Company to conduct any such sale. The City may also by written Notice of Default to Contractor terminate the whole or part of this Agreement in the event Contractor or any of its officers or employees are convicted, plead nolo contendere, enter into a formal agreement in which they admit guilt, enter a plea of guilty, or otherwise admit culpability to criminal offenses of bribery, kickbacks, collusive bidding, bid-rigging, antitrust, fraud, undue influence, theft, racketeering, extortion or any offense of a similar nature, in connection with Contractor's business. Contractor may terminate this Agreement upon ten (10) days prior written notice if (a) the City breaches this Agreement and the breach remains uncured for thirty (30) days after receipt of written notice of the breach, or (b) Bank fails to honor its obligations under the LPA.

10. **WHEN RIGHTS AND REMEDIES NOT WAIVED:** In no event shall any payment by the City hereunder constitute or be construed to be a waiver by the City of any breach of term, covenant, or condition or any default which may then exist on the part of Contractor, and the making of any such payment when any such breach or default shall exist shall not impair or prejudice any right or remedy available to the City with respect to such breach or default; and no assent, expressed or implied, to any breach of any one or more terms, covenants, or conditions of the Agreement shall be construed as a waiver of any succeeding or other breach.

11. **EXAMINATION OF RECORDS AND AUDITS:** Any authorized agent of the City, including the City Auditor or his or her representative, upon reasonable notice, has the right to access, and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Contractor's performance pursuant to this Agreement, provision of any goods or services to the City, and any other transactions related to this Agreement. Contractor shall cooperate with City representatives and City representatives shall be granted access, upon reasonable notice, to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audits pursuant to this paragraph shall require Contractor to make disclosures in violation of state or federal privacy laws. Contractor shall at all times comply with D.R.M.C. 20-276.

12. **TAXES, PERMITS AND LICENSES:** Contractor agrees to pay promptly all taxes, excises, license fees and permit fees of whatever nature applicable to its operations, and to take out and keep current all required licenses or permits, whether municipal, state or federal, required for the conduct of its business hereunder, and further agrees not to permit any of said taxes, excises or license

or permit fees to become delinquent. Contractor further agrees to furnish the City, upon request, duplicate receipts or other satisfactory evidence showing the prompt payment by Contractor of all required licenses and permits and all taxes. Contractor further agrees to pay promptly when due all bills, debts and obligations incurred by it in connection with its operations, and not to permit the same to become delinquent and to suffer no lien, mortgage, judgment or execution to be filed which will in any way impair the rights of the City under this Agreement.

13. **VENUE, GOVERNING LAW:** Each and every term, condition, or covenant herein is subject to and shall be construed in accordance with the provisions of Colorado law, any applicable federal law, the Charter of the City and County of Denver and the ordinances, regulations, and Executive Orders enacted and/or promulgated pursuant thereto. Such applicable law, together with the Charter, Revised Municipal Code, regulations and Executive Orders of the City and County of Denver, as the same may be amended from time to time, is hereby expressly incorporated into this Agreement as if fully set out herein by this reference. Venue for any action arising hereunder shall be in the Denver County or Denver District Court in the City and County of Denver, Colorado.

14. **USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS:** Contractor, its officers, agents, and employees shall cooperate and comply with the provisions of Executive Order 94 and Attachment A thereto concerning the use, possession or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in the City's barring Contractor from City facilities or participating in City operations.

15. **ASSIGNMENT AND SUBCONTRACTING:**

A. Provided that the City shall have accepted the Equipment, the City shall not have the right to and shall not assert against any assignee of Bank or other registered owner of the Equipment any claim, counterclaim or other right the City may have against the Contractor.

B. None of the City's right, title and interest in any portion of the Equipment may be assigned or encumbered by the City for any reason; except that the City may sublease all or part of such Equipment if (a) such sublease is to an agency or department of, or a political subdivision of, the State or (b) the City obtains the prior written consent of Bank and an opinion of nationally recognized counsel in the area of tax exempt municipal obligations satisfactory to Bank that such subleasing will not adversely affect the exclusion of the interest components of the rental payments made to Bank under the lease-purchase transaction referenced herein from gross income for federal income purposes. Any such sublease of all or part of any Equipment shall be subject to the lease-purchase transaction with Bank and the rights of Bank in, to and under such transaction with respect to the Equipment.

C. The City is otherwise not obligated or liable under this Agreement to any party other than the Contractor named herein. Contractor understands and agrees that it shall not assign or subcontract with respect to any of its rights, benefits, obligations or duties under this Agreement except upon prior written consent and approval of the City, which consent or approval may be withheld in the absolute discretion of the City; and in the event any such assignment or subcontracting shall occur, such action shall not be construed to create any contractual relationship between the City and such assignee or subcontractor, and Contractor herein named shall remain fully responsible to the City according to the terms of this Agreement.

16. **NO DISCRIMINATION IN EMPLOYMENT:** In connection with the performance of work under the Agreement, the Contractor may not refuse to hire, discharge, promote, demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, ethnicity, citizenship, immigration status, gender, age, sexual orientation, gender identity, gender expression, marital status, source of income, military status, protective hairstyle, or disability. The Contractor shall insert the foregoing provision in all subcontracts.

17. **INSURANCE:**

A. **General Conditions:** Contractor agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Contractor shall keep the required insurance coverage in force at all times during the term of the Agreement, including any extension thereof, and during any warranty period. The required insurance shall be underwritten by an insurer licensed or authorized to do business in Colorado and rated by A.M. Best Company as "A-VIII" or better. Each policy shall require notification to the City in the event any of the required policies be canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Such notice shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, Contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. Contractor shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of the Contractor. The Contractor shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

B. **Proof of Insurance:** Contractor may not commence services or work relating to this Agreement prior to placement of coverages required under this Agreement. Contractor certifies that the certificate of insurance attached as **Exhibit B**, preferably an ACORD form, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the certificate of insurance. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

C. **Additional Insureds:** For Commercial General Liability, Auto Liability and Excess Liability/Umbrella (if required), Contractor and subcontractor's insurer(s) shall include the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

D. **Waiver of Subrogation:** For all coverages required under this Agreement, Contractor's insurer shall waive subrogation rights against the City.

E. **Subcontractors and Subconsultants:** Contractor shall confirm and document that all subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) procure and maintain coverage as approved by the Contractor and appropriate to their respective primary business risks considering the nature and scope of services provided.

F. **Workers' Compensation and Employer's Liability Insurance:** Contractor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims.

G. **Commercial General Liability:** Contractor shall maintain a Commercial General Liability insurance policy with minimum limits of \$1,000,000 for each bodily injury and property damage occurrence, \$2,000,000 products and completed operations aggregate (if applicable), and \$2,000,000 policy aggregate.

H. **Automobile Liability:** Contractor shall maintain Automobile Liability with minimum limits of \$1,000,000 combined single limit applicable to all owned, hired and non-owned vehicles used in performing services under this Agreement.

I. **City's Insurance.** The City is self-insured pursuant to the Colorado Governmental Immunity Act, C.R.S. §24-10-101 et seq., and shall not be required to obtain any liability, fire, casualty or other insurance as a result of this Agreement. Neither shall any contrary statement contained in any attachment or exhibit hereto be construed to shift the risk of loss or liability to the City.

18. **DEFENSE AND INDEMNIFICATION:**

A. Contractor hereby agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to the work performed under this Agreement ("Claims"), unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of the City. This indemnity shall be interpreted in the broadest possible manner to indemnify City for any acts or omissions of Contractor or its subcontractors either passive or active, irrespective of fault, including City's concurrent negligence whether active or passive, except for the sole negligence or willful misconduct of City.

B. Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether Claimant has filed suit on the Claim. Contractor's duty to defend and indemnify City shall arise even if City is the only

party sued by claimant and/or claimant alleges that City's negligence or willful misconduct was the sole cause of claimant's damages.

C. Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.

D. Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of the Contractor under the terms of this indemnification obligation. The Contractor shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.

E. This defense and indemnification obligation shall survive the expiration or termination of this Agreement.

F. In the event of any claim to the City concerning infringement or violation of a third party's intellectual property rights, the City will endeavor to promptly notify Contractor in writing of any such claim and will cooperate with Contractor and its legal counsel in the defense thereof. Contractor may in its discretion (1) contest, (2) settle, (3) procure for the City the right to continue using the Equipment, software, or services, or (4) modify or replace them to be non-infringing (as long as the functionality and performance are not degraded as reasonably determined by the City). The City may participate in the defense of such action at its own expense. If none of the foregoing options is reasonably possible, then Contractor will refund a pro-rata portion of the amounts paid hereunder with respect to the Equipment, software, or services (based on the expected life thereof) and reimburse the City for all reasonable expenses for removal and replacement of the Equipment or software. Contractor is not liable for any infringement-related liabilities based upon modifications to the Equipment or software made by the City without Contractor's consent or being used or sold with products not provided by Contractor and made without Contractor's consent.

19. **CONFLICT OF INTEREST**: The parties agree that no official, officer or employee of the City shall have any personal or beneficial interest whatsoever in the services or property described herein and Contractor further agrees not to hire or contract for services any official, officer or employee of the City or any other person which would be in violation of the Denver Revised Municipal Code Chapter 2, Article IV, Code of Ethics, or Denver City Charter Sections 1.2.9 and 1.2.12.

20. **NO THIRD-PARTY BENEFICIARY**: It is expressly understood and agreed that enforcement of the terms and conditions of this Agreement, and all rights of action relating to such enforcement, shall be strictly reserved to the City and Contractor, and nothing contained in this Agreement shall give or allow any such claim or right of action by any other or third person or entity on such Agreement, including but not limited to subcontractors and suppliers. It is otherwise the express intention of the City and Contractor that any person or entity other than the City or Contractor

receiving services or benefits under this Agreement shall be deemed to be an incidental beneficiary only.

21. **CONFIDENTIAL INFORMATION**

A. “**Confidential Information**” means all information or data disclosed in written or machine recognizable form and is marked or identified at the time of disclosure as being confidential, proprietary, or its equivalent. Each of the Parties may disclose (a “Disclosing Party”) or permit the other Party (the “Receiving Party”) access to the Disclosing Party’s Confidential Information in accordance with the following terms. Except as specifically permitted in this Agreement or with the prior express written permission of the Disclosing Party, the Receiving Party shall not: (i) disclose, allow access to, transmit, transfer or otherwise make available any Confidential Information of the Disclosing Party to any third party other than its employees, subcontractors, agents and consultants that need to know such information to fulfil the purposes of this Agreement, and in the case of non-employees, with whom it has executed a non-disclosure or other agreement which limits the use, reproduction and disclosure of the Confidential Information on terms that afford at least as much protection to the Confidential Information as the provisions of this Agreement; or (ii) use or reproduce the Confidential Information of the Disclosing Party for any reason other than as reasonably necessary to fulfil the purposes of this Agreement. This Agreement does not transfer ownership of Confidential Information or grant a license thereto. The City will retain all right, title, and interest in its Confidential Information.

B. Contractor shall provide for the security of Confidential Information and information which may not be marked, but constitutes personally identifiable information, HIPAA, CJIS, or other federally or state regulated information (“Regulated Data”) in accordance with all applicable laws, rules, policies, publications, and guidelines. If Contractor receives Regulated Data outside the scope of the Agreement, it shall promptly notify the City.

C. Confidential Information that the Receiving Party can establish: (i) was lawfully in the Receiving Party’s possession before receipt from the Disclosing Party; or (ii) is or becomes a matter of public knowledge through no fault of the Receiving Party; or (iii) was independently developed or discovered by the Receiving Party; or (iv) was received from a third party that was not under an obligation of confidentiality, shall not be considered Confidential Information under this Agreement. The Receiving Party will inform necessary employees, officials, subcontractors, agents, and officers of the confidentiality obligations under this Agreement, and all requirements and obligations of the Receiving Party under this Agreement shall survive the expiration or earlier termination of this Agreement.

D. Nothing in this Agreement shall in any way limit the ability of the City to comply with any laws or legal process concerning disclosures by public entities. The Parties understand that all materials exchanged under this Agreement, including Confidential Information, may be subject to the Colorado Open Records Act., § 24-72-201, *et seq.*, C.R.S., (the “Act”). In the event of a request to the City for disclosure of confidential materials, the City may advise Contractor of such request in order to give Contractor the opportunity to object to the disclosure of any of its materials which it marked as, or otherwise asserts is, proprietary or confidential. If Contractor objects to disclosure of any of its material, Contractor shall identify to the City the legal basis under the Act for any right to withhold. In the event of any action or the filing of a lawsuit

to compel disclosure, Contractor agrees to intervene in such action or lawsuit to protect and assert its claims of privilege against disclosure of such material or waive the same. If the matter is not resolved, the City will tender all material to the court for judicial determination of the issue of disclosure. Contractor further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of Contractor's intervention to protect and assert its claim of privilege against disclosure under this Article, including but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs, and damages that the City may incur directly or may be ordered to pay.

22. **DISPUTES:** All disputes of whatsoever nature between the City and Contractor regarding this Agreement shall be resolved by administrative hearings pursuant to the procedure established by Denver Revised Municipal Code §56-106(b) et. seq. For the purposes of that procedure, the City official rendering a final determination shall be the City representative identified in Article 2 hereof.

23. **TAXES, CHARGES AND PENALTIES:** The City shall not pay or be liable for any claimed interest, late charges, fees, taxes or penalties of any nature, except as required by the City's Revised Municipal Code.

24. **PARAGRAPH HEADINGS:** The captions and headings set forth herein are for convenience of reference only and shall not be construed so as to define or limit the terms and provisions hereof.

25. **SEVERABILITY:** It is understood and agreed by the parties hereto that if any part, term, or provision of this Agreement, except for the provisions of the Agreement requiring prior appropriation of funds and limiting the total amount payable by the City, is by the courts held to be illegal or in conflict with any law of the State of Colorado, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Agreement did not contain the particular part, term, or provision held to be invalid.

26. **SURVIVAL OF CERTAIN AGREEMENT PROVISIONS:** The parties understand and agree that all terms, conditions and covenants of this Agreement, together with the exhibits and attachments hereto, if any, any or all of which, by reasonable implication, contemplate continued performance or compliance beyond the expiration or termination of this Agreement (by expiration of the term or otherwise), shall survive such expiration or termination and shall continue to be enforceable as provided herein. Without limiting the generality of the foregoing, Contractor's obligations for the provision of insurance, for indemnity to the City and for preserving confidentiality of trade secrets and other information shall survive for a period equal to any and all relevant statutes of limitation, plus the time necessary to fully resolve any claims, matters, or actions begun within that period.

27. **AGREEMENT AS COMPLETE INTEGRATION - AMENDMENTS:** This Agreement, together with the LPA, are intended as the complete integration of all understandings between the parties as to the subject matter of this Agreement. No prior or contemporaneous addition, deletion, or other amendment hereto shall have any force or effect whatsoever, unless embodied

herein in writing. No subsequent novation, renewal, addition, deletion, or other amendment hereto shall have any force or effect unless embodied in a written amendatory or other Agreement properly executed by the parties. No oral representation by any officer or employee of the City at variance with the terms and conditions of this Agreement or any written amendment to this Agreement shall have any force or effect or bind the City. Amendments to this Agreement will become effective when approved by both parties and executed in the same manner as this Agreement. This Agreement and any amendments shall be binding upon the parties, their successors and assigns.

28. **LEGAL AUTHORITY:**

A. Contractor assures and guarantees that it possesses the legal authority, pursuant to any proper, appropriate and official motion, resolution or action passed or taken, to enter into this Agreement.

B. The person or persons signing and executing this Agreement on behalf of Contractor, do hereby warrant and guarantee that he/she or they have been fully authorized by Contractor to execute this Agreement on behalf of Contractor and to validly and legally bind Contractor to all the terms, performances and provisions herein set forth.

C. The City shall have the right, at its option, to either temporarily suspend or permanently terminate this Agreement, if there is a dispute as to the legal authority of either Contractor or the person signing the Agreement to enter into this Agreement. The City shall not be obligated to pay Contractor for any performance of the provisions of this Agreement after the City has suspended or terminated this Agreement as provided in this Article.

29. **COUNTERPARTS OF THIS AGREEMENT:** This Agreement shall be executed in two (2) counterparts, each of which shall be deemed to be an original of this Agreement.

30. **NO EMPLOYMENT OF A WORKER WITHOUT AUTHORIZATION TO PERFORM WORK UNDER THE AGREEMENT**

A. This Agreement is subject to Division 5 of Article IV of Chapter 20 of the Denver Revised Municipal Code, and any amendments (the "Certification Ordinance").

B. The Contractor certifies that:

(1) At the time of its execution of this Agreement, it does not knowingly employ or contract with a worker without authorization who will perform work under this Agreement, nor will it knowingly employ or contract with a worker without authorization to perform work under this Agreement in the future.

(2) It will participate in the E-Verify Program, as defined in § 8-17.5-101(3.7), C.R.S., and confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement.

(3) It will not enter into a contract with a subconsultant or subcontractor that fails to certify to the Contractor that it shall not knowingly employ or contract with a worker without authorization to perform work under this Agreement.

(4) It is prohibited from using the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligations under this Agreement, and it is required to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.

(5) If it obtains actual knowledge that a subconsultant or subcontractor performing work under this Agreement knowingly employs or contracts with a worker without authorization, it will notify such subconsultant or subcontractor and the City within three (3) days. The Contractor shall also terminate such subconsultant or subcontractor if within three (3) days after such notice the subconsultant or subcontractor does not stop employing or contracting with the worker without authorization, unless during the three-day period the subconsultant or subcontractor provides information to establish that the subconsultant or subcontractor has not knowingly employed or contracted with a worker without authorization.

(6) It will comply with a reasonable request made in the course of an investigation by the Colorado Department of Labor and Employment under authority of § 8-17.5-102(5), C.R.S., or the City Auditor, under authority of D.R.M.C. 20-90.3.

C. The Contractor is liable for any violations as provided in the Certification Ordinance. If the Contractor violates any provision of this section or the Certification Ordinance, the City may terminate this Agreement for a breach of the Agreement. If this Agreement is so terminated, the Contractor shall be liable for actual and consequential damages to the City. Any termination of a contract due to a violation of this section or the Certification Ordinance may also, at the discretion of the City, constitute grounds for disqualifying the Contractor from submitting bids or proposals for future contracts with the City.

31. **ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS:** Contractor consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

32. **NOTICES:** All notices required by the terms of the Agreement must be hand delivered, sent by overnight courier service, mailed by certified mail, return receipt requested, or

mailed via United States mail, postage prepaid, if to Contractor at the address first above written, and if to the City at:

Executive Director of Department of
Transportation & Infrastructure or Designee
201 West Colfax Avenue, Dept. 608
Denver, Colorado 80202

With a copy of any such notice to:

Denver City Attorney's Office
1437 Bannock St., Room 353
Denver, Colorado 80202

Notices hand delivered or sent by overnight courier are effective upon delivery. Notices sent by certified mail are effective upon receipt. Notices sent by mail are effective upon deposit with the U.S. Postal Service. The parties may designate substitute addresses where or persons to whom notices are to be mailed or delivered. However, these substitutions will not become effective until actual receipt of written notification.

33. **COMPLIANCE WITH ALL LAWS:** Contractor shall perform or cause to be performed all services in full compliance with all applicable laws, rules, regulations and codes of the United States, the State of Colorado; and with the Charter, ordinances, rules, regulations and Executive Orders of the City and County of Denver.

34. **NO CONSTRUCTION AGAINST DRAFTING PARTY:** The parties and their respective counsel have had the opportunity to review the Agreement, and the Agreement will not be construed against any party merely because any provisions of the Agreement were prepared by a particular party.

35. **ADVERTISING AND PUBLIC DISCLOSURE:** The Contractor shall not include any reference to the Agreement or to services performed pursuant to the Agreement in any of the Contractor's advertising or public relations materials without first obtaining the written approval of the Manager. Any oral presentation or written materials related to services performed under the Agreement will be limited to services that have been accepted by the City. The Contractor shall notify the Manager in advance of the date and time of any presentation. Nothing in this provision precludes the transmittal of any information to City officials.

36. **CITY EXECUTION OF AGREEMENT:** The Agreement will not be effective or binding on the City until it has been fully executed by all required signatories of the City and County of Denver, and if required by Charter, approved by the City Council.

Exhibits:

Exhibit A – Equipment
Exhibit B – COI

[Signatures on following page]

Contract Control Number: DOTI-202262300-00
Contractor Name: FRONT RANGE FIRE APPARATUS, LIMITED

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at Denver, Colorado as of:

SEAL

CITY AND COUNTY OF DENVER:

ATTEST:

By:

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

Attorney for the City and County of Denver

By:

By:

By:

Contract Control Number:
Contractor Name:

DOTI-202262300-00
FRONT RANGE FIRE APPARATUS, LIMITED

By:  62B69796A4544FG...

Name: Duane Doucette
(please print)

Title: President
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

EXHIBIT A
EQUIPMENT

<u>Quantity</u>	<u>Item</u>	<u>Price</u>
1	Pierce Velocity 100' Platform (Quote #: 1012)	\$1,412,670.00
2	Pierce Velocity Pumper (Quote #: 1011)	\$1,420,265.00
TOTAL PURCHASE AMOUNT:		<hr/> \$2,832,935.00

Specifications of equipment, training, and warranties to be provided by Contractor are set out on the attached pages, which together with this cover sheet constitute **Exhibit A**.



FRONT RANGE FIRE APPARATUS

**7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com**

**DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com**



PERFORM. LIKE NO OTHER.™

FOR FURNISHING FIRE APPARATUSNovember 14, 2021City and County of Denver

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Front Range Fire Apparatus., at its home office in Frederick, Colorado, the apparatus and equipment herein named and for the following prices:

(1) Pierce Velocity 100' Platform per attached component list	\$1,412,670.00
 HGAC FS12-19	
 Delivery is approximately 16.5 to 18.5 months	
Option 1: Make Chassis Pre-Payment of \$516,948.00	
 Due in Net 30 Days of Signed Contract	Deduct (\$15,508.00)
Option 2: Make 100% Prepayment of \$1,368,170.00	
 Due in Net 30 Days of Signed Contract	Deduct (\$44,500.00)
Additional discount if ordered on or before 01/31/2022	Deduct (\$94 070.00)
Total	\$ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 16.5 to 18.5 months after receipt of this order and the acceptance thereof at our office at Frederick, Colorado, and to be delivered to you Denver, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The specification for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

FRONT RANGE FIRE APPRATUS.

By: _____
Duane Doucette
SALES REPRESENTATIVE





Option List

11/14/2021

Customer:	Denver Fire Department	Bid Number:	1012
Representative	Doucette, Duane	Job Number:	
Organization:	Front Range Fire Apparatus, Ltd	Number of Units:	1
Requirements Manager:		Bid Date:	11/08/2021
Description:	Platform, 100' Rearmount - Denver	Stock Number:	
Body:	Aerial, Platform 100', No Pump, Alum Body	Price Level:	40 (Current: 40)
Chassis:	Velocity Chassis, PAP (Big Block), 2010	Lane:	Unknown 1-2

Line	Option	Type	Option Description	Qty
1	0766653		Boiler Plates, Aerial 100' Platform w/o Pump Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 25 Miles Number of Fire Dept/Municipalities - 25 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0018180		Single Source Compliance, Aerials	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - Velocity 100' Platform job #33961 in some aspects, pictures provided	1
7	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
8	0533349		Aerial Fire Apparatus	1
9	0588613		Vehicle Certification, Aerial w/o Pump	1
10	0681279		Agency, Apparatus Certification, Aerial w/o Pump, U.L.	1
11	0799172		FLEET CUSTOMER	1
12	0092138		Highly Customized Product (HCP)	1
13	0620362		Consortium, HGAC	1
14	0535579		Not Required, Unit of Measure, (no pump, no tank)	1
15	0030006		Bid Bond Not Requested	1
16	0582800		Performance Bond, 100% with 25% Warranty Bond, 1 Yr, and Payment Bond	1
17	0000007		Approval Drawing	1
18	0611571	SP	Drawing, As Built, At Delivery a Revised Print w/ Changes, FLEET	1
19	0002928		Electrical Diagrams	1
20	0564213		Velocity Chassis, PAP (Big Block), 2010	1
21	0021007		Maximum Overall Height Size - 11'9"	1
22	0000110		Wheelbase Wheelbase - 247"	1
23	0000070		GVW Rating GVW rating - 76,800 pounds	1
24	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
25	0756525		Frame Liner, Internal "C" 12.50" x 3.00" x .25", XT/Vel/Imp,Enf Full Lgth, 56"Qv	1
26	0508849		Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel	1
27	0051595		Suspension, Front TAK-4, 22,800 lb, 3" Jounce, AXT/Vel/Imp/DCF/Enf	1
28	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
29	0000322		Oil Seals, Front Axle	1
30	0899438		Tires, Front, Goodyear, Armor MAX MSA, 425/65R22.50, 20 ply	1
31	0019611		Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot	1
32	0530480		Axle, Rear, Meritor RT52-185, 54,000 lb, Imp/Vel/Dash CF	1
33	0671918	SP	Axle Ratio, Rear Axle, (6.14), Electronically Limited Top Speed, 60mph	1
34	0555354		Suspen, Rear, Hendrickson FMX 542 EX, Air Ride, 54,000 lb	1
35	0000485		Oil Seals, Rear Axle	1
36	0587016		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Tandem	1
37	0019639		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Tandem	1
38	0642999		Tire Balancing, Not Required	1
39	0602747		No Tire Pressure Indicator, Fire Department Omits, Non-NFPA 2016 Compliant	1

Line	Option	Type	Option Description	Qty
40	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
41	0002045		Mud Flap, Front and Rear, Pierce Logo	1
42	0769127	SP	Tire, "Crossfire" Air Pressure Equalization (tandem), 95 PSI	1
43	0031931		Valve, Extension Stabilizer System, Rear Duals	1
44	0601010		Chocks, Wheel, SAC-44-E, Folding, Aerials	1
			Qty, Pair - 01	
45	0601009		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal, Aerials	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward	
46	0593759		ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010	1
47	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
48	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
49	0731553		Air Compressor, Brake, Cummins/Wabco 25.9 CFM	1
50	0000789		Brake Reservoirs, Five	1
51	0587033		Air Dryer, Brake, AD-9 w/heat, 2010	1
52	0000790		Brake Lines, Nylon	1
53	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - a) DS Step Well, Rearward	
			Qty, Air Coupling (s) - 1	
54	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
55	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
56	0070810		All Wheel Lockup (Aerial/Tanker Chassis)	1
57	0014130		Air Tank, Additional for Extra Air Horn Capacity	1
58	0612549		Fittings, Compression Type, Entire Apparatus, Tandem Rear Axle	1
59	0602848	SP	Air Line, S/S Braid, Air Governor	1
60	0736412		Engine, Cummins X12, 500 hp, 1695 lb-ft, W/OBD, EPA 2021, Velocity	1
61	0730962		Filters, Remote Mounted, Oil, Fuel, X12, VEL/AXT, ENF, QTM	1
62	0001244		High Idle w/Electronic Engine, Custom	1
63	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - e) ISC/ISM/ISL9/ISX Hi Med Lo	
64	0607623	SP	Clutch, Fan, Air Actuated, Horton Drive Master, Compression Fitting	1
65	0123135		Air Intake, w/Ember separator, Imp/Vel	1
66	0794743		Exhaust System, 5", X12/X15, MX13, Engine, Horizontal, Right Side	1
67	0688512	SP	Exhaust, 35 Degree w/modified end for extraction system, Approval Req'd	1
68	0787999		Radiator, Impel/Velocity	1
69	0720998	SP	Cooling Hoses, Gates Silicone and Rubber Combo, Include .25" Surge Tank	1
70	0014124		Skid Plate, Radiator, All Custom Chassis	1
71	0673756		Winter Cover With Ventilation, Front Cab Grille, One Piece, Vel	1
			Color, Vinyl Cover - d) White	
72	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
73	0001129		Lines, Fuel	1
74	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
75	0723716		Fuel Priming Pump, Electronic, Automatic, Cummins, No Swt Req'd	1
76	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
77	0553019		Cooler, Engine Fuel, Imp/Vel, AXT/Qtm/Sab/DCF/SFR/Enf	1
78	0578959		Fuel/Water Separator, Racor Inline	1
79	0642591		Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	1
			Trans. retarder capacity - e. medium/1600, 4000 EVS	
			Trans. retarder control - l) Auto 1/3, 2/3, 3/3	
80	0625331		Transmission, Shifter, 6-Spd, Push Button, 4000 EVS	1
81	0797408		Transmission Oil Cooler, Modine, External, w/Modine External Sump	1
82	0027844		Fluid, 4000 Series Trans, Allison Approved TES-295 Synthetic, IPOS, Custom	1
83	0001375		Driveline, Spicer 1810	1
84	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
85	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
86	0509230		Steering Wheel, 4 Spoke without Controls	1
87	0690274		Logo/Emblem, on Dash	1
			Text, Row (1) One - Denver	

Line	Option	Type	Option Description	Qty
87			Text, Row (2) Two - Fire	
			Text, Row (3) Three - Department	
88	0680598		Credit, Drum Pump Kit, Grease, Vogel Lube System	1
89	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension	1
			Location - reservoir will be centered between the boom support, same as job 32624	
90	0123624		Bumper, 16" Extended, Imp/Vel	1
91	0616467		Tray, Tool, Center, 16" Bumper, Outside Air Horns, Imp/Vel	1
			Grating, Bumper extension - Grating, None	
92	0617307		Cover, Aluminum Treadplate, Two (2) Flush Lift and Turn Latches, Tool Tray	1
			Stay arm, Tray Cover - b) Pneumatic Stay Arm	
93	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
94	0522573		Tow Hooks Not Required, Due to Lift and Tow Package	1
95	0777636		Cab, Velocity FR, 8410 Raised Roof w/Deep Notch	1
96	0724207		Engine Tunnel, X12-15, MX13, Mech Fasteners, Velocity FR	1
97	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
98	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
99	0123176		Grille, Bright Finished, Front of Cab, Impel/Velocit	1
100	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab	1
			Material Trim/Scuffplate - c) S/S, Polished	
101	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity	1
			Material Trim/Scuffplate - b) S/S, Brushed	
			Turnsignal Covers - No Covers	
102	0087357		Molding, Chrome on Side of Cab	1
103	0559130		Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven	1
			Finish, Arm Cover - Chrome	
			Finish, Mirror Head - Chrome	
104	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof	1
			Key Model, Cab Doors - 1041	
			Cab, Exterior Door Handle, Finish - 4-Door, Chrome/Black	
105	0655511		Door Panel, Brushed Stainless Steel, Impel/Velocit	1
106	0667905		Storage Pockets w/ Elastic Cover, Recessed, Overhead, Impel/Velocit FR	1
107	0641245	SP	Controls, Electric Windows, All Cab Doors, Impel/Velocit FR Design	1
108	0555485		Steps, 4-Door Full Tilt Cab, Imp/Vel	1
109	0770194		Handrail, Exterior, Knurled, Alum, 4-Door Cab	1
110	0552559		Steps, Stirrup, Formed, Cab & Crew Cab Doors, Imp/Vel	1
			Light, Step, Additional - P25 LED	
111	0509649		Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 1Lt Per Step	1
112	0002140		Fenders, S/S on Cab	1
113	0199245		Window, Side of C/C, Fixed, 84"/104" Vel/Imp	1
114	0552934		Trim, Cab Side Windows, 84" Velocity	1
115	0012090		Not Required, Windows, Front/Side of raised roof	1
116	0509287		Windows, Rear CC, (2) 11.25" x 18", Velocity	1
117	0553196		Trim, Cab Rear Windows, Velocity	1
118	0898691		Compt, Transverse Crew Cab, Dbl Pan, 84/104" Vel/Imp	1
			Light, Short Transverse Compt - OnScene Night Axe, 2 Sect, Hinged Side	
			Louvers - Door	
			Scuffplate, Material/Finish - S/S, Polished	
			Finish, Exterior Cab Compt - Spatter Gray	
			Door, Cab Exterior Cabinet - Double Pan, (2), Non-Locking	
			Door, Exterior Stop - 2-Stay Arm	
			Door, Cab Interior Cabinet - Lap, Drop, S/S, (2) Latches, Non-Locking	
119	0748671		Cab Interior, Vinyl, Velocity FR, CARE	1
			Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	
120	0667943		Cab Interior, Paint Color, Impel/Velocit FR	1
			Color, Cab Interior Paint - a) gray	
121	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
122	0741239		HVAC, Impel/Velocit FR, CARE	1
			Paint Color, A/C Condenser - Painted to Match Cab Roof	
			HVAC System, Filter Access - Tool Free Panel	
			Auxiliary Cab Heater - Both	
123	0028432		Brush Guard/Cover, Air Conditioning Condenser, 4-way, Cab Roof Aerial	1

Line	Option	Type	Option Description	Qty
124	0639675		Sun Visor, Smoked Lexan, AXT, Imp/Vel, Saber FR/Enforcer	1
			Sun Visor Retention - No Retention	
125	0548173		Grab Handles, Driver and Passenger Door Post, Imp/Vel	1
126	0002526		Light, Engine Compt, All Custom Chassis	1
127	0122516		Fluid Check Access, Imp/Vel	1
128	0583042		Side Roll and Frontal Impact Protection	1
129	0699999		Not Required, Frontal Impact Protection, 2010	1
130	0699998		Not Required, Side Roll Protection Package, 2010	1
131	0622618		Seating Capacity, 5 Seats	1
132	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
133	0696994		Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	1
134	0656795		Radio Compartment, Behind Officer Air Ride SCBA Seat, Imp/Vel	1
135	0102788		Not Required, Seat, Rear Facing C/C, DS Outboard	1
136	0102783		Not Required, Seat, Rr Facing C/C, Center	1
137	0102790		Not Required, Seat, Rear Facing C/C, PS Outboard	1
138	0122716		Seat, Forward Facing C/C, DS Outboard, Pierce PS6, Premium, SCBA, Safety	1
139	0122745		Seat, Forward Facing C/C, Center, (1) Pierce PS6, Premium, SCBA, Safety	1
140	0122729		Seat, Forward Facing C/C, PS Outboard, Pierce PS6, Premium, SCBA, Safety	1
141	0566653		Upholstery, Seats In Cab, Turnout Tuff	1
			Color, Cab Interior Vinyl/Fabric - m) Gray	
142	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats	4
			Qty, - 04	
143	0603867		Seat Belt, ReadyReach	1
			Seat Belt Color - Red	
144	0604864		Seat Belt Height Adjustment, 5 Seats, Imp/Vel, Dash CF	1
145	0627014		Pick Not Required, Seat Belt Color Selected in Seat Belt Option 627339	1
146	0543133		Bracket, Helmet Holder, Zico UHH-1	1
			Qty, Helmet Storage Brkt - 5	
147	0647637		Lights, Dome, Weldon Dual LED 6 Lts	1
			Color, Dome Lt - Red & White	
			Color, Dome Lt Bzl - Grey	
			Control, Dome Lt White - Door Switches and Lens Switch	
			Control, Dome Lt Color - Lens Switch	
148	0631779		Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk EX	1
			12vdc power from - Battery switched	
149	0893590		Spotlight, Golight Stryker, Model 30**4ST, LED, 2 Lts	1
			Location - on each side	
			Color, GoLt - White	
			Bracket, Spotlight - Pedestal - 2 Lts	
150	0893537		Controller, Spotlight, Golight Stryker ST, Wired Dash Mount, 2 Lts	1
151	0621826		Location, Spotlight Controller, Driver Overhead and Officer Overhead, 2 Lts	1
152	0000000	STF	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v, Orange	1
			Location, Portable Hand Light - shipped loose	
153	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010, Dash CF	1
154	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
155	0543751		Light, Do Not Move Apparatus	1
			Alarm, Do Not Move Truck - Pulsing Alarm	
156	0509042		Messages, Open Dr/DNMT, Color Dsply,	1
157	0611681		Switching, Cab, Membrane, Impel/Velocity/Quantum, Dash CF, AXT WiFi MUX	1
			Location, Emerg Sw Pnls - Driver's Side Overhead	
158	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	1
159	0002565		Hourmeter, Aerial Inside Cab	1
160	0002615		Switch, Aerial 12V Master	1
161	0002617		PTO switch, w/light - aerial	1
162	0548009		Wiring, Spare, 20 A 12V DC 1st	2
			Qty, - 02	
			12vdc power from - Battery direct	
			Wire termination - Stud	
			Location, Spare Wiring - officer overhead console	
163	0548006		Wiring, Spare, 15 A 12V DC 2nd	1
			Qty, - 01	

Line	Option	Type	Option Description	Qty
163			12vdc power from - Battery direct Wire termination - 15 amp power point plug Location - on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical	
164	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 02 12vdc power from - Battery direct Wire termination - Butt Splice Location, Spare Wiring - two in the front of the cab behind panel #9	2
165	0566101		Recess, Dash Panel, Officer Side, Vel/Imp	1
166	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX System Of Measurement - US Customary	1
167	0734857		Collision Mitigation, HAAS Alert (R2V), HA5 Subscription, HAAS R2V - R2V - 5 Year Data Plan Subscription	1
168	0606247		Vehicle Data Recorder w/CZ Display Seat Belt Monitor	1
169	0003757		Antenna, Std and Add'l Mts Only, 2-way Radio,Cust,Spl Cable Routing Location - routed to the office seat box Qty, - 03 Location 1 - one on passenger front corner of raised roof and one in each rear corner of the crew cab roof	3
170	0653526		Camera, Pierce, Driver Mux, Rear Camera Only Camera System Audio - Not Provided	1
171	0615100		Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
172	0730603		Electrical System, Velocity ESP, Cummins, Paccar	1
173	0727172	SP	Batteries, (5) Exide Grp 31, 950 CCA each, Threaded Stud	1
174	0008621		Battery System, Single Start, All Custom Chassis	1
175	0123174		Battery Compartment, Imp/Vel	1
176	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp Bar Display	1
177	0796062	SP	Location, Charger, w/Location Feature Location - Location LS5 rearward wall mounted as high as possible, see photo in Job E-Folder	1
178	0531403		Location, Bat Chrg Ind, Driver's Seat with Bracket	1
179	0016856		Shoreline, 15A 120V, Kussmaul Auto Eject, 091-55-15-120, Super Qty, - 01 Color, Kussmaul Cover - d) yellow Connection, Shoreline - the battery charger and six place receptacle strip in the cab	1
180	0026800		Shoreline Location Location, Shoreline(s) - DS Rear bulkhead	1
181	0529667		Cover, Protection Battery Box IO Modules	1
182	0566294		Alternator, 430 amp, Niehoff C680-1	1
183	0660887	SP	Antenna Mount, NMO on Body w/100' LMR240 Ultra Location - at the rear of the truck centered over the traffic advisor on passenger side Qty, - 01 Location, Antenna Cable - officer seat box	1
184	0695819		Sealer (Gorp), No Gorp Req'd on Elect Connections Except Fuel Sender	1
185	0603291	SP	Open Weather Pack Connections Plugged W/Weather Pack Connectors	1
186	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
187	0648716		Headlights, Rectangular Halogen, Imp/Vel	1
188	0648425		Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
189	0768311		Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt LED 2lts	1
190	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
191	0647993		Lights, Clearance/Marker/ID, Platform, P25 LED, 5 Lts Light Guard - Without Guard	1
192	0090155		Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	1
193	0602938		Light, Marker End Outline, Rubber Arm, LED Marker Lamp, Rear Body Qty, Lights, Pair - 1	1
194	0551870		Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
195	0551875		Lights, Backup, WIn M6BUW, LED	1

Line	Option	Type	Option Description	Qty
196	0664466		Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp Under Tailbrd Location - driver side	1
197	0589905		Alarm, Back-up Warning, PRECO 1040	1
198	0763690		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver	1
199	0728314	SP	Lights, Perimeter Cab, Truck-Lite 44310C LED, Spcl Location	1
200	0616274		Lights, Perimeter Body, Truck-Lite 44308C LED 2lts, Turntable Access Control, Perimeter Lts - DS Switch Panel	1
201	0768061		Lights, Wln, PCPSM2* Pioneer, 12 VDC, 1st Location - behind passenger side cab door, high as possible Qty, - 01 Color, Wln Lt Housing - Chrome Cover	1
202	0768059		Control, Scene Lts - Cab Sw Panel DS and Cab Sw Panel PS Lights, Wln, PCPSM2* Pioneer, 12 VDC, 2nd Location - behind driver side cab door, high as possible Qty, - 01 Color, Wln Lt Housing - Chrome Cover	1
203	0631374		Control, Scene Lts - Cab Sw Panel DS and Cab Sw Panel PS Lights, Deck, Wln (2) MPPBCS Micro Pioneer LED Rear Flood Lights	1
204	0645676		Control, Scene Lts - Sw Included on Light Lights, Not Required, Hose Bed, Deck Lights At Rear	1
205	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
206	0645687		Lights, Rear Scene, Wln, M6ZC LED, 1st Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS Location, Scene Lights - DS Rear Body Bulkhead, High, 1lt and PS Rear Body Bulkhead, High, 1lt	2
207	0763248		Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas Location - front of cargo area Qty, Cargo Lts - 1	1
208	0020536		Aerial, Platform 100', No Pump, Alum Body	1
209	0554269		Body Skirt Height, 18"	1
210	0553729		Not Required, Restraint, Water Tank, Heavy Duty	1
211	0597794		Cargo Area Construction, No Pump (PAP)	1
212	0723547		Painted Hose Bed/Cargo Area Paint Color, Hose Bed Interior - Match Lower Body	1
213	0746293	SP	Cross-Divider, Fixed, In Hose Bed, w/Knock Out, Ascendant SA Location - at the front of the hose bed, match 31433 Qty, - 01	1
214	0736259	SP	Turntable Steps-Morton, Swing, Recessed Rr Handrail, LS/RS, Ascend TA, PAL, PAP, Hndhld	1
215	0554004		Lights, Step (6), P25 LED, Swing Down Access Steps, Each Side	1
216	0690023		Wall, Rear, Smooth Aluminum	1
217	0029503		Tow Eyes (2), Painted, Aerial	1
218	0579271	SP	Construction, Compt, Alum, 100' PAP, 23547 ONLY	1
219	0033674		Compt w/No Pump, 36" Wide w/Rollup Door	1
220	0579270	SP	Compt, DS F/H F/D, Roll Drs, w/o Chute, 100' PAP, D Series Modules	1
221	0788188	SP	Compt, DS Turntable, F/H F/D, Roll Drs, Special Door Height, 100' PAP, D Series	1
222	0023672		Compt, IPO Stairs, Not Required, LS	1
223	0677255	SP	Compt, PS F/H F/D, Roll Drs, w/o Chute, 100' PAP, D Series Modules	1
224	0788189	SP	Compt, PS Turntable, F/H F/D, Roll Drs, Special Door Height, 100' PAP, D Series	1
225	0023673		Compt, IPO Stairs, Not Required, RS	1
226	0594007		Doors, Amdor, Rollup, Side Compartments Qty, Door Accessory - 10 Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	10
227	0602122	SP	Body Modification, Rear Wall, Sensors	1
228	0552955		Blister, Compts in Front of Rear Axle, To Clear Firemaax Suspension	1
229	0609440	SP	Bumper, Rear, 5" w/Treadplate Cover on Top, Sides, Rear, PAP/PAL/RMAP	1
230	0788393	SP	Door Stop, Reduced in Height, Amdor Rollup Door Location, Door Accessory - LS2 and RS2	1
231	0551416		Lights, Compt, On Scene Solutions, LED & Truck-Lite Model 79384 Location - all body compartment including torque box	11

Line	Option	Type	Option Description	Qty
231			Qty, - 11	
232	0587545		Lights, Compt, On Scene Solutions, LED Night Stik, 9", Additional Location, Lights - LS5 and RS5 outrigger compartments	2
			Qty, - 02	
233	0603420		Shelf Tracks, Painted, Aerial Qty, Shelf Track - 06	6
			Location, Shelf Track - LS1, LS3, LS4, RS1, RS3 and RS4	
234	0600289		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations, Aerial Qty, Shelf - 06	6
			Material Finish, Shelf - Painted - Spatter Gray	
			Location, Shelves/Trays, Predefined - RS3-Centered, RS4-Upper Third, RS1-Upper Third, LS3-Centered, LS4-Upper Third and LS1-Upper Third	
235	0052485	SP	Compt, Transverse Over Torque Box, Special, PAP Location - compartment D4/P4	1
			Qty, Comp. Accessory - 01	
			Size - as large as possible, per engineering a 15.25" recess in the forward section is required for generator mounting between forward outriggers	
236	0004033		Rub Rail, Aluminum Extruded, Side of Body, Xtra Space (.50")	1
237	0004027		Fender Crowns, Rear, S/S, Two Pair	1
238	0601235		Compt, Air Bottle, Single, Round, Fender Panel, Tandem Axle Aerials Qty, Air Bottle Comp - 7	7
			Door Finish, Fender Compt - Polished	
			Location, Fender Compt - Single (2) - LS Tandem, Single (2) - RS Tandem, Single - LS Fwd, Single - LS Rear and Single - RS Rear	
			Latch, Air Bottle Compt - Flush Lift & Turn	
			Insert, Air Bottle Compt - Rubber Matting	
238	0000000	STF	Ladder, 35' Duo-Safety 1200A 2-Sect, Provide by FRFA Qty, - 1	1
238	0000000	STF	Ladder, 28', Duo-Safety 1200A 2-Sec, Provided By FRFA	1
238	0000000	STF	Ladder, 28' Duo-Safety 1200A 2-Sec, Provided by FRFA Qty, - 1	1
238	0000000	STF	Ladder, 16' Duo-Safety 875A Roof, Provided By FRFA Qty, - 02	2
238	0000000	STF	Ladder, 14' Duo-Safety 875-DR Roof with 7/8" Hooks, Both Ends Qty, - 1	1
			Location - aerial fly section	
239	0521218		Not Required, Attic Extension Ladder	1
239	0000000	STF	Ladder, 10' Duo-Safety Folding, 585A, Provided By FRFA Qty, - 01	1
			Location, Folding Ladder Aerial - torque box	
240	0579266	SP	Ladders Stored in Torque Box, Gortite Roll, w/Glide Plate, PAP, D Series Modules Color, Roll-up Door, Gortite - Satin finish	1
241	0796497	SP	Lights, Torque Box Ladder Storage, Not Required	1
241	0000000	STF	Ladder, Little Giant, Super Duty Type 1AA - Model 17, 10402 Location - ship loose	1
242	0527241	SP	Slides, Dura-Surf, Troughs Fill in Blank - all torque box ladder storage troughs	1
243	0658170		Ladders, Nested, Right Side Ground Ladder Storage	1
243	0000000	STF	Pole, Pike 3' DUO Safety, Fiberglass w/D Handle, Provide By FRFA Location - ship loose along with the two (2) 3' Fire Hooks Unlimited pike poles	2
			Qty, Pike Poles - 2	
243	0000000	STF	Pike Pole, 12' DUO Safety, Fiberglass, Provided by FRFA Qty, - 02	2
243	0000000	STF	Pole, Pike 8' DUO Safety, Fiberglass, Provided By FRFA Qty, Pike Poles - 2	2
			Location - torque box	
243	0000000	STF	Pole, Pike 6' DUO Safety, Fiberglass, Aerial, Provided by FRFA Qty, - 02	2
243	0000000	STF	Pike Pole, 3' Fire Hooks Unlimited, National Hook w/D Handle, Provided By FRFA Qty, - 02	2
244	0770578		Pike Pole Tubes, in Torque Box/Ladder Storage, ABS Qty, - 06	6
245	0024388		No Steps Required, Front Of Body	1

Line	Option	Type	Option Description	Qty
246	0621993	SP	Cover, Over Cargo Area, Incl Fasteners at Rear, 22 oz Yellow Vinyl, Aerial Type of fastener - bungee cord and hook with pull tab-Sides of Cargo Type of fastener, Rear - bungee cord and hook with pull tabs-Rear of Cargo	1
247	0606694		Air Horns, (2) Hadley, 6" Round, In Bumper	1
248	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, Inboard (Pos #2 & #6)	1
249	0757092		Control, Air Horn, Multi Select	1
250	0757081		Control, Air Horn, Ft Sw, LS	1
251	0757080		Control, Air Horn, Ft Sw, RS	1
252	0006100		No Electronic Siren	1
253	0046133		No Siren Location	1
254	0076155		No Siren Switch	1
255	0006188		No Speaker	1
256	0550461		Location, Not Required, No Speaker (Q2B)	1
257	0895310		Siren, Federal Q2B Finish, Q2B Siren - Chrome	1
258	0006095		Siren, Mechanical, Mounted Above Deckplate Location, Siren, Mech - a) Left	1
259	0748305		Control, Mech Siren, Multi Select	1
260	0748281		Control Mech Siren, Ft Sw RS	1
261	0748280		Control Mech Siren, Horn Ring	1
262	0740834		Sw, Siren Brake, Momentary Red, LS Overhead Sw Pnl	1
263	0741233	SP	Grounding Wire, Q2B Siren Motor to Ground Stud, No Gorp	1
264	0893861	SP	Control, Warning Lt Intensity, WIn, Prk Brk Released	1
265	0738991	SP	Lights, WIn, M6**, RRRR RRRR LED 8Lts, Prk Brk Interlock Color, Lens, LED's - Clear Color, Trim - Chrome Trim	1
266	0553843		Lights, Frnt Zn Upr, Pltform, WIn, M6R* Red LED 2lts Location, Lights - one in front of each monitor, just below the clears, see picture of previous unit in Job 24895 Flange Kit - w)with flange Color, Lens, LED's - m)match LED's	1
267	0543659		Lights, Basket, WIn, M6*, LED, Colored Lens Location - each side of the basket on the door will be two (2) red lights side by side, , see picture of previous unit in Job 24895 Color, Light - ae) red Qty, - 04	4
268	0543668		Lights, Basket, WIn, M6*, LED, Clear Lens 1st Location - forward of each monitor, clear on top red on bottom, see photo of 24895 Color, Light - white Qty, - 02	2
269	0691541		Light, GTT, 792* Strobe Opticom Emitter, Mounted On Platform Basket Location - center of platform basket Opticom Priority - b) High Opticom Activation - Cab Switch & E-Master Momentary Opticom Activation - no activation	1
270	0691531		Cover, Opticom Emitter, Aluminum Treadplate	1
271	0898734		Light, Front Zone, WIn M6** M6** M6** M6** Q Bzl Color, Lens, LED's - Colored Color, Lt DS Frnt Outside - Left Red Color, Lt PS Frnt Outside - Right Red Color, Lt DS Front Inside - Left White Color, Lt PS Front Inside - Right White Color, Q Bezel and Trim - Polished Chrome	1
272	0747228		Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts Location, Lights Front Side - b)each side bumper Color, Lens, LED's - Colored Location, Lights Mid Side - Over Front Wheels Location, Lights Rear Side - Between Tandem Color, Trim - Chrome Trim Color, Lt Side Front, DS - Red Color, Lt Side Front, PS - Red Color, Lt Side Mid DS - Blue	1

Line	Option	Type	Option Description	Qty
272			Color, Lt Side Mid PS - Blue Color, Lt Side Rear PS - Red Color, Lt Side Rear DS - Red	
273	0899856		Lights, Side, Wln M6**, 45 Deg Bzl, Cab Corner, 1st Qty, - 02 Color, Lights, Warning - Red Flashing Control, Light - b) side warning Color, Lens, LED's - Match Material, Bracket - Polished S/S Color, Trim - Chrome Trim	2
274	0746422		Lights, Rear Zone Lower, Wln M6* LED, Lw Int Color, Lens, LED's - Match Color, Lt DS Rear - r) DS Rear Lt Red Color, Lt PS Rear - r) PS Rear Lt Red Color, Trim - Chrome Trim	1
275	0746415		Lights, Rear, Wln M6** LED, Features 1st, Lw Int Location - above the taillights Qty, - 02 Color, Lights, Warning - Blue Flashing Control, Light - a) rear upper warning Color, Lens, LED's - Colored Color, Trim - Chrome Trim	2
276	0680854		Light, Rear Zone Up, Wln B6M7**1P, Super LED Beacon w/M7 LED Lt Color, Lights, Warning - c) amber Color, Dome, Rear Warning - b)both domes red Control, Light - a) rear upper warning Color, Lens, LED's - m)match LED's	1
277	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
278	0762435		Light, Traffic Directing, Wln TAL85, 46.87" Long LED, Lens Feature Activation, Traffic Dir L - Not Connected Color, Lens, LED's - c)clear	1
279	0529861		Location, Traf Dir Lt, Surface Mounted Over Rear Door with Treadplate Box	1
280	0530288		Location, Traf Dir Lt Controller, Overhead Recessed Console, above Eng Tnl DS	1
281	0006646		Electrical System, 120/240VAC, General Design	1
282	0682571	SP	Generator, Harrison 6kW, 6.0MAS-16R/D-11011/15/1, Hydraulic, Hotshift PTO, Spcl Generator Interlocks - Parking Brake/Neutral Location, Gen Info Panel - near breaker box	1
283	0015429		Mounting, Hydraulic Generator Above Torque Box Location, Generator - area between the forward outriggers	1
284	0016752		Starting Sw, Truck Engine Powered Gen, Cab Sw Pnl	1
285	0016757		Not Required, Remote Start, Generator	1
286	0016740		Not Required, Fuel System	1
287	0016767		Not Required, Oil Drain Extension, Generator	1
288	0036738		Circuit Breaker Panel, Included With PTO Generator Location, Circuit Breaker Panel - LS6, Back Wall to the Left	1
289	0518647	SP	Location, Gen Meter Panel, Spcl Location Inside Compartment, IPO Std. Location - D6 body compartment on forward wall - see photos on S:drive	1
290	0016771		Not Required, Routing Exhaust, Generator	1
291	0747476		Light, Wln, 150W 120V, PCP2AP* LED Floodlt, PBAPEDA Pedestal Mt 1st Location, 120/240 Volt Lt - one (1) each side at the rear of the compartments D3 and P3 Qty, 120/240 Volt Light - 2 Switch, Lt Control 1 DC,1 - m) no control Switch, Lt Control 2 DC,2 - e) No Control Switch, Lt Control 3 DC,3 - m) Breaker Panel Switch, Lt Control 4 DC,4 - d) No Control Color, Wln Lt Housing - White Paint	2
292	0006825		Reel, Elect Cable, Hannay, 1600, (3) Wire Qty, Cord Reels - 1 Reel Guide - a) Nylatron guide Finish, Reel - Painted Gray Location, Electric Cord Reel - D6, From Ceiling	1

Line	Option	Type	Option Description	Qty
293	0006828		Cord, Electric, 10/3 Yellow, 3 Wire Lengths of Elect Cord - 1 Feet of Yellow Cord - e)200 Connection, Cord - Direct connection	1
294	0788932		Box, Junc, Akron, 3Wire, 4-15/20A 120V Dup SB Qty, - 01 Connection, Electric Plug / Inlet (Male) - Direct Connection	1
295	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab Qty, - 1 Location 1 - along the back of the engine dog house tied up loose (see photo) AC Power Source - Shoreline	1
296	0779698		Receptacle Strip, 15A 120V 6-Place, Interior Body Qty, - 01 Location 1 - in D2 (see photo) mounted high across the top rear corner AC Power Source - Shoreline	1
297	0783678		Receptacle, 15/20A 120V 3-Pr 3-Wr, NEMA 5-20R SB Dup, 1st Location, Receptacles - one at the rear of the body on passenger side Qty, - 01 AC Power Source - Generator Cover, Receptacle - Exterior Flip Up Duplex Cover(s)	1
298	0519934		Not Required, Brand, Hydraulic Tool System	1
299	0682194	SP	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver	1
300	0000038		Boom Support, Recessed in Compt IPO Pump	1
301	0762413		Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	1
302	0680821		Boom Panel, Pair Paint Color, Predefined - #20 White	1
303	0526890		Not Required, Indicator, Extension	1
304	0688232		Rung Covers, Aerial Device Rung Cover Color - Safety Yellow	1
305	0678539		Brackets Only, Roof/Wall Ladder, Aerial Fly Section Finish - DA Finish Roof Ladder, Make/Model - 14' Duo-Safety 875-A-DR	1
306	0798982	SP	Basket, 100' PAP, Wide, NFPA 2016, Denver	1
307	0677439		Box, Hose Storage, Platform Qty, - 01 Latch, Door, Storage - Rubber Draw Latch Location, Aerial Basket - right Cover - cover Hose Size, Hosebox - 100' of 1.75"	1
308	0601972		Lights, Turntable Walkway, P25, LED	1
309	0601949		Light, Turntable Console, TecNiq T-10, LED Strip Light	1
310	0657520		Guard, Turntable Lighting	1
311	0732760		Basket Heat Shields	1
312	0508717		Control Stations, 100' PAP, Color Display	1
313	0682196	SP	Stabilizers, 100' PAP, Two Sets, Split Pan, Denver Material, Stabilizer Pad - Composite	1
314	0728961		Stabilizer Pan Material Stabilizer Panels - polished stainless steel	1
315	0530817		Aerial Stabilizer Pins	1
316	0548900		Door, Stabilizer Control Box, Aerial MUX, Hinged Outboard, Smooth Aluminum	1
317	0682192	SP	Hydraulic System, 100' PAP, Denver	1
318	0672956	SP	Swivels, D-Series w/Encoder, PAP MUX (36 Collector Rings)	1
319	0682195	SP	Electrical System, 100' PAP, D Series Modules, Denver	1
320	0775442		Lights, WIn MPB* Micro LED Trk 2lts, P*H2P LED @ Basket 1lt (PAP) Location, Sw, Arl DC Lts - m) 2 locations Scene Light Optics - Flood Scene Lt Optics LH Base - Flood Scene Lt Optics RH Base - Flood Color, WIn Lt Housing Tip - White 1 Color, WIn Lt Housing Track - White	1
321	0540746		Lights, Stabilizer Warn (2) Sets, WIn M6* LED, Colored Lens Color, Lt Rr Stabilzr Pan - r) Pan Light Red	1

Line	Option	Type	Option Description	Qty
321			Color, Lt Fr Stabilizr Pan - r) Pan Light Red	
322	0068701		Lights, Grote Supernova LED, Stabilizer Beam, (2) Sets	1
323	0601974		Lights, Stabilizer Scene, (2) sets, Truck-Lite 44042C, LED	1
324	0017101		120 Volt To Tip, 2-15/20A 120V, Pigtail. (PAP)	1
325	0673610		Light, Wln PFP2AC, 120 Volt LED Under Basket, PAP	2
			Qty, - 02	
			Location, Sw, Arl AC Lts - M)2 Pos	
			Location, Plat/Tip AC Lts - J) Under DS/PS Down	
			Color, Wln Lt Housing - White Paint	
326	0662734		Light, Wln PFP2AP1*, 120 Volt, Fld/Fld LED, Top Raise, Rear Basket	2
			Qty, - 02	
			Location, Sw, Arl AC Lts - A) 1 Pos	
			Location, Plat/Tip AC Lts - C) Drvr and Pass	
			Color, Wln Lt Housing - White Paint	
327	0016924		Intercom, 2-Way Atkinson (PAP)	1
328	0540922		Breathing Air to Tip, (1) 6000 PSI, 100 PAP	1
			Refill Hose - 100'	
			Breathing Air Fitting - CEJN	
			Breathing Air Mask Box - mask box platform rubber draw latch	
329	0024742		Not Required, Mask, Breathing Air To Tip	1
330	0056918		Not Required, Raised Aerial Pedestal	1
331	0540605		Lyfe Brackets, 3-In-1, Used w/Duo-Safety 875 Ladders ONLY, Wide Basket	1
			Width - 19.00"	
332	0530826		Turntable Access, ManSaver Bars, Yellow	1
333	0016950		Waterway, 100' PAP	1
334	0016952		(1) Preconnect At Platform, 2 Monitors	1
335	0698663	SP	Monitors, (2) Elkhart Scorpion 8294-02, Manual Control	1
			Nozzle, Monitor 1, PAP - Elkhart ST195 Tips/284A Shaper	
			Nozzle, Monitor 2, PAP - Elkhart ST195 Tips/284A Shaper	
336	0086971		Flowmeter, Waterway, MUX, PAP	1
337	0683810	SP	Inlet, 6.00" at Rear w/o Pump DS IPO Std Center (PAP)	1
337	0000000	STF	Elbow, Aerial Inlet, 6" FNST x 5" Storz w/Cap, Gray Finish	1
			Location - rear waterway inlet	
			Qty, - 1	
338	0047901		Not Required, Tools, Aerial, PAL/PAP	1
339	0559491		Manuals and Training, 3 Consecutive Days, Platform	1
340	0007150		Bag of Nuts and Bolts	1
			Qty, Bag Nuts and Bolts - 1	
341	0602507		NFPA Required Loose Equipment, Aerial, NFPA 2016, Provided by Fire Department	1
342	0602535		Extinguisher, Dry Chemical, Aerial NFPA 2016, Provided by Fire Department	1
343	0602354		Extinguisher, 2.5 Gal. Pressurized Water, Aerial,NFPA 2016,Provided by Fire Dept	1
344	0007482		Not Required, Crowbars	1
345	0007484		Not Required, Claw Tools	1
346	0602675		Axes, (2) Flathead, Aerial NFPA 2016, Provided by Fire Department	1
347	0602673		Axes, (3) Pickhead, Provided by Fire Department, Aerial NFPA 2016	1
348	0007494		Not Required, Sledgehammers	1
349	0741569		Paint Process / Environmental Requirements, Appleton	1
350	0709763		Paint, Single Color, Velocity/Impel	1
			Paint Color, Cab - #20 White	
351	0709845		Paint, Single Color, Body	1
			Paint, Body - Match Lower Cab	
352	0636524		Coating, Chassis Frame Assy, With Liner, Hot Dip Galvanized	1
			Paint Color, Frame Assembly, Predefined - Gloss Black	
353	0693797		No Paint Required, Aluminum Front Wheels	1
354	0693792		No Paint Required, Aluminum Rear Wheels	1
355	0733739		Paint, Axle Hubs	1
			Paint, Axle Hub - Primary Job Color	
356	0581434		Transit Coating, Carwell, Corrosion Protection, Including Underside	1
357	0007230		Compartment, Painted, Spatter Gray	1
358	0792638		Aerial Platform Paint	1
			Paint Color, Aerial Device - Blue White 20	
			Paint Color, Turntable - Blue White 20	

Line	Option	Type	Option Description	Qty
358			Paint Color, Boom Support - gloss black primer Paint Color, Cylinders - blue white 20 Paint Color, Aerial Torque Box - gloss black primer Paint Color, Aerial Stabilizers - black 101 Paint Color, Aerial Basket - blue white 20 Paint Color, Aerial Rotation Motor - blue white 20 Paint Color, Aerial Control Console - blue white 20	
359	0544129		Reflective Band, 1"-6"-1" Color, Reflect Band - A - e) black Color, Reflect Band - B - t) gold Color, Reflect Band - C - za) black	1
360	0510041		Reflective across Cab Face, Imp/Vel	1
361	0583454		Stripe, Chevron, Rear, Diamond Grade, Aerial Color, Rear Chevron DG - fluorescent yellow green	1
362	0598754		Stripe, Reflective/Diamond Grade, 4.00" on Stabilizers Color, Reflect Band - A - g) yellow	1
363	0027341		Jog, In Reflective Stripe, Single or Multiple Qty, - 1	1
364	0515348		Stripe, Black Outline, Scotchlite on Reflective Band Qty, - 1	1
365	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior Color, Reflect Band - B - t) gold Size, Chevron Striping - 04 Color, Reflect Chev - A - e) black	1
366	0033179		Lettering Specifications, Reflective	1
367	0686159		Lettering, Reflective, 3.00", (41-60) Outline, Lettering - Outline	1
368	0685991		Lettering, Reflective, 10.00", (21-40) Outline, Lettering - Outline	1
369	0515269		Lettering, Reflective 2" Script w/outline Color, Lettering - e) black	1
370	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each Qty, - 04 Location, Emblem - one on each side on the cab doors and one each side on the platform basket Color, Reflective - i) gold	4
371	0522815		Emblem, American Flag, Waving, Gerber Vision, Pair Location, Emblem - in the window over the rear cab doors	1
372	0666414		Emblem, Freedom Flag, Each Qty, - 01 Location, Emblem - R1 Size, Flag - 24" - 25"	1
372	0000000	STF	Cummins Trouble Shooting and Parts Manuals, Denver	1
372	0000000	STF	Service - Oil Change and Lube, Denver	1
372	0000000	STF	Service - Oil Samples, Denver	1
372	0000000	STF	Allison Transmission Service & Parts Manual, Denver	1
372	0000000	STF	Intercom, David Clark Allowance for Denver Truck - 2018	1
372	0000000	STF	Akron Trimeese (3) 2.5" (F) NST x 6" (F) NST - Denver NEW!!! Qty, - 1	1
372	0000000	STF	Oval Strapping Heron Rib - roll - RED Qty, - 02	2
372	0000000	STF	Inspection trip #1 - when - number of people Location - at customer location for a preconstruction conference. Qty, - 02	2
372	0000000	STF	Inspection trip #3 - when - number of people Location - at the factory for a delivery inspection. Qty, - 02	2
372	0000000	STF	Inspection trip #2 - when - number of people Location - at the factory for a post paint inspection. Qty, - 02	2
373	0031972		Manuals, Two (2), Fire Apparatus Parts, Custom Chassis	1
374	0002905		Manuals, (2) Chassis Service, Custom	1
375	0032433		Manuals, Two (2) Chassis Operation, Custom	1

Line	Option	Type	Option Description	Qty
376	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
377	0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	1
378	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1
379	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
380	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
381	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
382	0733305		Warranty, Tandem Axle, 5 Year, Meritor, General Service, WA0384	1
383	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
384	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
385	0744240		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
386	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
387	0695416		Warranty, Pierce Camera System, WA0188	1
388	0708760		Warranty, Not Applicable, LED Strip Lights	1
389	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
390	0685945		Warranty, Transmission Cooler, WA0216	1
391	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
392	0693126		Warranty, AMDOR, Roll-up Door, 10 Year/5 Year Painted, WA0185	1
393	0006999		Warranty, Structure, 20 Year, Aerial Device, WA0052	1
394	0687388		Warranty, Swivels, 5 Year, Aerial Device, WA0197	1
395	0088889		Not Required, Additional Aerial Warranty	1
396	0687327		Warranty, Waterway, 10 Year, Aerial Device, WA0198	1
397	0595860		Warranty, Paint, 4 Year, Aerial Device, Pro-Rated, WA0047	1
398	0553455		Warranty, Electronics, 5 Year, MUX, WA0014	1
399	0725636		Warranty, Harrison Generator, 2 Year	1
400	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
401	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
402	0683627		Certification, Vehicle Stability, CD0156	1
403	0736237		Certification, Engine Installation, Velocity, Cummins X12, 2021	1
404	0686786		Certification, Power Steering, CD0098	1
405	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
406	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
407	0548967		Certification, Windshield Wiper Durability, Impel/Velocity, CD0005	1
408	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
409	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
410	0735950		Certification, Cab HVAC System Perf, Vel/Imp FR, CD0166/CD0168/CD0176/CD0177	1
411	0545073		Amp Draw Report, NFPA Current Edition	1
412	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
413	0799248		Appleton/Florida BTO	1
414	0000033		PAP BODY	1
415	0000012		PIERCE CHASSIS	1
416	0004713		ENGINE, OTHER	1
417	0046396		EVS 4000 Series TRANSMISSION	1
418	0020015		ABS SYSTEM	1
419	0658751		PUMPER BASE	1

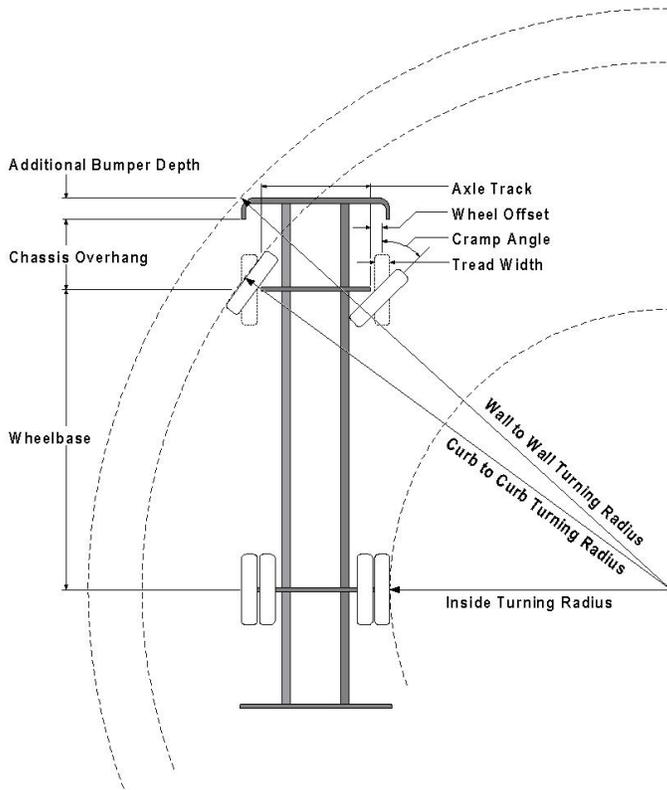


Turning Performance Analysis

11/14/2021

Bid Number: 1012
Department: Denver Fire Department

Chassis: Velocity Chassis, PAP (Big Block), 2010
Body: Aerial, Platform 100', No Pump, Alum Body



Parameters:

*Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	16.3 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	16 in.
Front Overhang:	156.6 in.
Wheelbase:	247 in.

Calculated Turning Radii:

Inside Turn:	19 ft. 6 in.
Curb to curb:	35 ft. 5 in.
Wall to wall:	44 ft. 2 in.

Category	Option	Description
Wheels, Front	0019611	Wheels, Front, Alcoa, 22.50" x 12.25", Aluminum, Hub Pilot
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Aerial Devices	0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load Allowance, Denver
Tires, Front	0899438	Tires, Front, Goodyear, Armor MAX MSA, 425/65R22.50, 20 ply
Bumpers	0123624	Bumper, 16" Extended, Imp/Vel
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel
Axle, Front, Custom	0508849	Axle, Front, Oshkosh TAK-4, Non Drive, 22,800 lb, Imp/Vel

Notes:

*Actual Inside cramp angle may be less than shown.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



Electrical Analysis

11/14/2021

Bid #: 1012

Job #:
Desc: Platform, 100' Rearmount - Denver

Sales Rep: Doucette, Duane

Customer: Denver Fire Department

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Handlights, (4) Streamlight, Fire Vulcan, 44451, C4 LED, Tail Lts, 12v,		0.00	0.50	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0002617	PTO switch, w/light - aerial		0.00	0.00	0.08
0006825	Reel, Elect Cable, Hannay, 1600, (3) Wire		0.00	36.00	0.00
0016924	Intercom, 2-Way Atkinson (PAP)		0.00	0.00	3.00
0033674	Compt w/No Pump, 36" Wide w/Rollup Door		0.00	0.00	3.60
0086971	Flowmeter, Waterway, MUX, PAP		0.00	0.00	0.50
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0508717	Control Stations, 100' PAP, Color Display		0.00	0.00	2.00
0543659	Lights, Basket, Wln, M6*, LED, Colored Lens		0.00	1.46	0.79
0543668	Lights, Basket, Wln, M6*, LED, Clear Lens 1st		0.00	1.35	0.90
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	30.00
0548006	Wiring, Spare, 15 A 12V DC 2nd		0.00	0.00	15.00
0548009	Wiring, Spare, 20 A 12V DC 1st		0.00	0.00	40.00
0551875	Lights, Backup, Wln M6BUW, LED		0.00	3.20	0.00
0559130	Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven		0.00	0.00	5.60
0587545	Lights, Compt, On Scene Solutions, LED Night Stik, 9", Additional		0.00	0.00	1.00
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593759	ESC/ABS/ATC Wabco Brake System, Tandem Rear Axle, 2010		0.00	6.00	0.00
0631779	Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk		0.00	0.74	0.00
0641245	Controls, Electric Windows, All Cab Doors, Impel/Velocity FR Design		0.00	26.00	0.00
0645687	Lights, Rear Scene, Wln, M6ZC LED, 1st		0.00	0.00	4.00
0653526	Camera, Pierce, Driver Mux, Rear Camera Only		0.00	1.20	0.00
0657520	Guard, Turntable Lighting		0.00	0.00	2.10
0673610	Light, Wln PFP2AC, 120 Volt LED Under Basket, PAP		0.00	0.00	1.26
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0682196	Stabilizers, 100' PAP, Two Sets, Split Pan, Denver		0.00	0.00	6.00
0727172	Batteries, (5) Exide Grp 31, 950 CCA each, Threaded Stud		0.00	2.50	0.00
0746293	Cross-Divider, Fixed, In Hose Bed, w/Knock Out, Ascendant SA		0.00	0.00	0.00
0746415	Lights, Rear, Wln M6** LED, Features 1st, Lw Int		0.00	2.70	1.80
0763248	Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas		0.00	0.00	0.00
0768059	Lights, Wln, PCPSM2* Pioneer, 12 VDC, 2nd		0.00	0.00	12.00
0768061	Lights, Wln, PCPSM2* Pioneer, 12 VDC, 1st		0.00	0.00	12.00
0893590	Spotlight, Golight Stryker, Model 30**4ST, LED, 2 Lts		0.00	0.00	7.96
0895310	Siren, Federal Q2B		0.00	100.00	0.00
0899856	Lights, Side, Wln M6**, 45 Deg Bzl, Cab Corner, 1st		0.00	2.70	1.80
0741239	HVAC, Impel/Velocity FR, CARE	LM	0.00	0.00	136.00
0002565	Hourmeter, Aerial Inside Cab	NFPA	0.10	0.00	0.00
0002615	Switch, Aerial 12V Master	NFPA	0.08	0.00	0.00
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0068701	Lights, Grote Supernova LED, Stabilizer Beam, (2) Sets	NFPA	3.20	3.20	0.00
0090155	Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	NFPA	0.50	0.00	0.00
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0509649	Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 1Lt Per Step	NFPA	1.00	0.00	0.00
0540746	Lights, Stabilizer Warn (2) Sets, Wln M6* LED, Colored Lens	NFPA	3.60	5.40	0.00
0551870	Lights, Tail, Wln M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0552559	Steps, Stirrup, Formed, Cab & Crew Cab Doors, Imp/Vel	NFPA	0.20	0.00	0.00
0553843	Lights, Frnt Zn Upr, Pltform, Wln, M6R* Red LED 2lts	NFPA	1.80	2.70	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

11/14/2021

Bid #: 1012

Job #:
Desc: Platform, 100' Rearmount - Denver

Sales Rep: Doucette, Duane

Customer: Denver Fire Department

Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0554004	Lights, Step (6), P25 LED, Swing Down Access Steps, Each Side	NFPA	0.30	0.00	0.00
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocit	NFPA	2.10	8.40	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocit	NFPA	1.26	0.00	0.00
0579270	Compt, DS F/H F/D, Roll Drs, w/o Chute, 100' PAP, D Series Modules	NFPA	2.70	0.00	2.70
0587033	Air Dryer, Brake, AD-9 w/heat, 2010	NFPA	4.70	0.00	0.00
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00
0601949	Light, Turntable Console, TecNiq T-10, LED Strip Light	NFPA	0.20	0.00	0.00
0601972	Lights, Turntable Walkway, P25, LED	NFPA	0.35	0.00	0.00
0601974	Lights, Stabilizer Scene, (2) sets, Truck-Lite 44042C, LED	NFPA	2.00	0.00	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0616274	Lights, Perimeter Body, Truck-Lite 44308C LED 2lts, Turntable Access	NFPA	1.00	0.00	0.00
0631374	Lights, Deck, Wln (2) MPPBCS Micro Pioneer LED Rear Flood Lights	NFPA	6.70	0.00	0.00
0642591	Trans, Allison 5th Gen, 4000 EVS PR, Imp/Vel/Dash CF	NFPA	2.00	2.00	0.00
0647637	Lights, Dome, Weldon Dual LED 6 Lts	NFPA	1.20	1.20	0.00
0647993	Lights, Clearance/Marker/ID, Platform, P25 LED, 5 Lts	NFPA	0.35	0.00	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648425	Light, Directional, Wln 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0664466	Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp	NFPA	0.69	0.00	0.00
0677255	Compt, PS F/H F/D, Roll Drs, w/o Chute, 100' PAP, D Series Modules	NFPA	3.60	0.00	3.60
0680854	Light, Rear Zone Up, Wln B6M7**1P, Super LED Beacon w/M7 LED Lt	NFPA	6.00	0.00	0.00
0682194	Aerial, 100' Pierce Platform, 50 MPH Wind Rating, 150lb Tip Load	NFPA	5.00	0.00	0.00
0682571	Generator, Harrison 6kW, 6.0MAS-16R/D-11011/15/1, Hydraulic,	NFPA	35.31	0.00	0.00
0728314	Lights, Perimeter Cab, Truck-Lite 44310C LED, Spcl Location	NFPA	1.08	0.00	0.00
0736412	Engine, Cummins X12, 500 hp, 1695 lb-ft, W/OBD, EPA 2021, Velocity	NFPA	6.00	0.00	0.00
0738991	Lights, Wln, M6**, RRRR RRRR LED 8Lts, Prk Brk Interlock	NFPA	9.00	4.50	4.50
0746422	Lights, Rear Zone Lower, Wln M6* LED, Lw Int	NFPA	1.80	2.70	0.00
0747228	Lights, Side Zone Lower, Wln M6**, M6**, M6**, 6Lts	NFPA	5.40	8.10	0.00
0762413	Light, Boom Support, Amdor AY-LB-12HW012, 12" LED	NFPA	0.18	0.00	0.00
0762435	Light, Traffic Directing, Wln TAL85, 46.87" Long LED, Lens Feature	NFPA	2.52	2.52	0.00
0768311	Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt	NFPA	0.10	1.00	0.00
0775442	Lights, Wln MPB* Micro LED Trk 2lts, P*H2P LED @ Basket 1lt (PAP)	NFPA	20.00	0.00	0.00
0777636	Cab, Velocity FR, 8410 Raised Roof w/Deep Notch	NFPA	6.80	10.20	0.00
0788188	Compt, DS Turntable, F/H F/D, Roll Drs, Special Door Height, 100'	NFPA	0.90	0.00	0.90
0788189	Compt, PS Turntable, F/H F/D, Roll Drs, Special Door Height, 100'	NFPA	1.80	0.00	1.80
0796497	Lights, Torque Box Ladder Storage, Not Required	NFPA	2.88	0.00	0.00
0898734	Light, Front Zone, Wln M6** M6** M6** M6** Q Bzl	NFPA	1.80	5.40	1.80
0566294	Alternator, 430 amp, Niehoff C680-1	S	0.00	0.00	0.00
Load Totals:			161.04	449.16	302.69

Note: Minimum Continous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 253.00
Alternator Output at Governed Speed:
365.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

11/14/2021

Bid #: 1012
Desc: Platform, 100' Rearmount - Denver
Customer: Denver Fire Department

Job #:
Sales Rep: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd

Minimum Continuous Load	
Supply:	253.00
Demand:	161.04
Variance:	91.96

Total Connected Load	
Supply:	365.00
Demand:	327.73
Variance:	37.27

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply

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Front Range Fire Apparatus is pleased to submit a to Denver Fire Department for a **Pierce® 100' Aerial Platform** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This document will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 75 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 62,500 apparatus, including more than 33,900 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 870,000 total square feet of floor space situated on approximately 105 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of NFPA 1901 standards, this document will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this document are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.

QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested

and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this document.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least twenty five (25) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus being proposed can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.

LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence\$1,000,000

Products/Completed Operations Aggregate\$1,000,000

Personal and Advertising Injury\$1,000,000

General Aggregate\$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit:\$1,000,000

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate:\$3,000,000

Each Occurrence:\$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence\$1,000,000

Products/Completed Operations Aggregate\$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence:\$25,000,000

Aggregate:\$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pump house (including the sheet metal enclosure, valve controls, piping and operators panel) body and aerial device will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus being proposed will be designed and built to match the Velocity 100' Platform job #33961 in some aspects, pictures provided. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the document as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

INSPECTION CERTIFICATE

A third party inspection certificate for the aerial device will be furnished upon delivery of the aerial device. The certificate will be Underwriters Laboratories Inc. Type 1 and will indicate that the aerial device has been inspected on the production line and after final assembly.

Visual structural inspections will be performed on all welds on both aluminum and steel ladders.

On critical weld areas, or on any suspected defective area, the following tests will be conducted:

- Magnetic particle inspection will be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets will be placed on each side of the weld while iron powder is placed on the weld itself. The powder will detect any crack that may exist. This test will conform to ASTM E709 and be performed prior to assembly of the aerial device.

- A liquid penetrant test will be conducted on aluminum aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. This test will conform to ASTM E165 and be performed prior to assembly of the aerial device.
- Ultrasonic inspection will be conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components.

In addition to the tests above, functional tests, load tests, and stability tests will be performed on all aerials. These tests will determine any unusual deflection, noise, vibration, or instability characteristics of the unit.

GENERATOR TEST

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

PRODUCT CHANGES AND IMPROVEMENTS

Our components and processes, as described in this document, are as accurate as known at the time of bid submission, but are subject to change for the purpose of product or process improvements, or changes in industry standards providing the change does not affect the meaning or definition of the bid specifications.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or

accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this document. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus will be 11'9" .

WHEELBASE

The wheelbase of the vehicle will be 247" .

GVW RATING

The gross vehicle weight rating will be 76,800 pounds .

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRAME REINFORCEMENT

In addition, a full-length mainframe internal "C" liner will be provided. The liner will be an internal "C" design that steps to a smaller internal "C" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x 0.25" through the front "C" portion of the liner, stepping to 9.38" x 3.00" x 0.25" through the rear "C" portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb.

The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces, and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have a torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension. The suspension and jounce bumpers will have increased rates to accommodate the reduced jounce travel. These modifications will provide a stiffer ride which may affect ride quality when compared to trucks set up with standard ride height.

The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 2.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear 425/65R22.50 radials, 20 ply Armor Max MSA, rated for 22,800 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 12.25" polished aluminum disc type wheels with a ten (10)stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RT-52-185, tandem axle assembly with a capacity of 54,000 lb.

An inter-axle differential, which divides torque evenly between axles, will be provided on the rear axle with an indicator light mounted on the cab instrument panel.

TOP SPEED OF VEHICLE

A rear axle ratio of 6.14 will be furnished. The engine will be programmed to limit the overall top speed to 60 MPH.

REAR SUSPENSION

Rear suspension will be a Hendrickson Model FMX 542 EX, air ride with a ground rating of 54,000 pounds. The suspension will have the following features:

- Outboard vertical mounted heavy-duty shock absorbers
- Utilizes track bars and torque rods to restrict lateral axle movement and maintain constant pinion angles
- Super heavy-duty transverse beam to help reduce axle stress while increasing roll stability or resistance to lean
- Low spring rate air springs for excellent ride quality
- Dual height control valves to maintain level vehicle from side to side

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).

REAR TIRES

Rear tires will be eight (8) Goodyear 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 54,240 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa® 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE PRESSURE INDICATOR

NFPA 1901, 2016 edition, section 4.13.4 requires each tire be equipped with a visual indicator or monitoring system that indicates tire pressure.

Per Fire Department specification, a tire pressure indicator is not on the apparatus as manufactured. This apparatus will be non-compliant to NFPA 1901 standards effective at time of contract execution.

FRONT HUB COVERS

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

AIR PRESSURE TIRE EQUALIZATION

A Crossfire air pressure equalization system will be provided on the rear dual wheels for 95 PSI. This system will equalize the tire air pressure in the rear duals and indicate over or under inflation.

STABILIZER SYSTEM (REAR VALVE STEMS)

A valve stem stabilizer system will be provided on the rear duals.

WHEEL CHOCKS

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

Wheel Chock Brackets

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted forward of the left side rear tire.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 6S6M, anti-lock braking system. The ABS will provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An

"off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 25.9 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 6,653 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, will be provided with an automatic spring brake application at 40 psi
- A pressure protection valve will be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa).
- Quarter turn drain valves on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

BRAKE SYSTEM AIR DRYER

The air dryer will be a Bendix AD-9, with heater and coalescing filter.

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located rearward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.

AIR HOSE

There will be two (2) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

ALL WHEEL LOCK-UP

An additional all wheel lock-up system will be installed which applies air to the front brakes only. The standard spring brake control valve system will be used for the rear.

ADDITIONAL AIR TANK FOR AIR HORN

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use.

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine rpm. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

COMPRESSION FITTINGS

Any nylon tube on the apparatus that is pneumatic will be plumbed with compression type fittings where applicable.

COMPRESSOR AIR LINE

The air line from the air compressor to the remote mounted governor will be stainless steel braid in place of standard Aeroquip hose.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	X12
Power:	500 hp at 1900 rpm
Torque:	1695 lb-ft at 1000 rpm
Governed Speed:	2000 rpm
Emissions Level:	EPA 2021
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	720 cubic inches (11.8L)
Starter:	Delco 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

REMOTE MOUNTED ENGINE FILTERS

The engine fuel and oil filters will be remote mounted for ease of maintenance.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high, medium and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system will automatically disengage the auxiliary braking device, when required.

CLUTCH FAN

A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. A compression fitting will be provided on the fan hub.

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a Single Module™ aftertreatment device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the aftertreatment device, and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The last 18.00" of the tail pipe will be at a 35 degree angle and without any restriction of hangers or clamps to ensure an easy deployment of an exhaust extraction hose.

RADIATOR

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates® silicone or a combination of silicone and rubber hoses will be used for the radiator and cab heater hoses installed by the chassis manufacturer.

The chassis manufacturer will also use Gates® brand hose on other heater and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances a comparable silicone hose from another manufacturer will be used.

Rubber hoses will be used for the overhead defrost/heater system.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

RADIATOR SKID PLATE

A lower radiator skid plate will be supplied for protection. The skid plate will be constructed of 0.25" steel plate.

VINYL WINTER FRONT

A custom one-piece white vinyl winter front will be provided for use in extreme cold weather. The vinyl will cover the front cab grille and will be held in place with quarter turn fasteners. There will be an 5.50" x 16.00" opening in the center for proper ventilation.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

FUEL PRIMING PUMP

A Cummins automatic electronic fuel priming pump will be integrated as part of the engine.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

FUEL COOLER

An air to fuel cooler will be installed in the engine fuel return line.

FUEL SEPARATOR

The engine will be equipped with a Racor in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

An Allison 5th generation, model EVS 4000PR, electronic, torque converting, automatic transmission with retarder will be provided.

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge, with red light and audible alarm, will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1600 ft. lb. torque (medium) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. A red indicator light will be provided to warn that the transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

The ABS system will automatically disengage the auxiliary braking device when required.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00
3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

TRANSMISSION COOLER

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

TRANSMISSION FLUID

The transmission will be provided with TranSynd, or other Allison approved TES-295 heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

CHASSIS LUBRICATION DRUM PUMP KIT CREDIT

A Vogel drum pump kit and extra grease will not be supplied with the system.

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located reservoir will be centered between the boom support, same as job 32624.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters
- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins

BUMPER

A one (1) piece, ten (10) gauge, 304-2B type polished stainless steel bumper, minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 16.00" from front face of cab.

Gravel Pan

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

CENTER TOOL TRAY

A tool tray, constructed of aluminum, will be placed in the center of the bumper extension.

No grating will be provided at the bottom of the tray. Drain holes are also provided.

Center Tool Tray Cover

A bright aluminum treadplate cover will be provided over the center tool tray.

The cover will be attached with a stainless steel hinge.

There will be two (2) flush lift and turn latches provided to secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW HOOKS

No tow hooks are to be provided. This truck will be equipped with a lift and tow package with integral tow eyes.

CAB

The Velocity cab will be designed specifically for the fire service and will be manufactured by the chassis builder.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together

that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A three (3)-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab roof will be provided with a 58.00" wide notch that lowers the center section of the cab roof by 3.00". The deep notch will continue from the front of the cab and extend full length to the rear of the cab. The deep notch will accommodate a low mount aerial device, and provide lower overall vehicle height.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 71.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A one (1)-piece safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The

inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The engine tunnel will be insulated for protection from heat and sound. Perforated foil faced insulation will be over a 1.00" thick closed cell foam affixed with pressure sensitive adhesive and further secured with mechanical fasteners. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The noise insulation keeps the dBA level within the limits stated in the current NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For

enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A band of 22 gauge brushed stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two (2)-sided tape. A 0.625" self adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

For enhanced visibility, safety and overall aesthetics, a forward positioned One-Eleven custom mirror will be mounted on each side of the front cab roof corner. Both front cab roof corners will be reinforced with an aluminum casting at the mounting location providing maximum stability for the mirror arm and head assembly. The mirror arm substructure will extend forward and outward of the cab and will be constructed out of 4.00" diameter, 0.25" wall, aluminum tubing. For reduced service cost, the mirror will include a dual breakaway design, controlled by a rotational detent mechanism. In the event of an impact, the mirror arm will breakaway to either the inboard or the outboard position. The One-Eleven

mirror head, and injection molded arm cover, will offer a sleek aerodynamic styling with overall width of 115.80" (reduces vehicle width by 7.00" when compared to door mount bus style mirrors). The arm cover finish will be chrome. The mirror head finish will be chrome. The mirror head and arm will provide a seamless appearance, and include a black painted metal cover plate on the underside of the arm to reduce glare. For maximum visibility and safety, a flat mirror section will be provided that measures 83 square inches in reflective area. There will also be an integral convex mirror section that will measure 27 square inches in reflective area. The flat glass and convex section in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

CAB DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The finish of the door handle will be chrome/black. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab and crew cab door.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.

The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.

STIRRUP STEPS

A stirrup step will be provided below each cab and crew cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 18.50" wide x 5.00" deep stepping surface. Each step will provide a step height of 8.25" from the top of the stirrup step to the first step of the cab.

The stirrup step will be lit by a white 12 volt DC LED light provided on the step.

The step light will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the crew cab door.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

WINDOWS, REAR

The rear wall of the crew cab will have two (2) windows, each being 11.25" wide x 18.00" high.

WINDOW INTERIOR TRIM

For improved aesthetics, the cab rear wall windows will include a vacuum formed ABS interior trim panel.

STORAGE COMPARTMENT

Provided under the forward facing crew cab seats will be a transverse compartment. The compartment shall be divided into upper and lower sections by the cab floor. The upper section will be 21.50" wide x 13.12" high x 24.25" deep (driver side) and 22.00" deep (passenger side). The top 7.38" of the upper compartment will be full width (transverse) of the crew cab. The lower section on both sides will be 21.50" wide x 15.50" high x 18.00" deep. The compartment will extend from the bottom of the cab to top of the seat riser.

There will be two (2) double pan doors painted to match the cab exterior with a non-locking D-Ring latch, one (1) on each side of the cab with a pneumatic stay arm for each exterior door provided as a door stop. The clear door opening will be 19.00" wide x 29.75" high.

The exterior access will be provided with a polished stainless steel scuffplate on the lower door frame.

There will be one (1) polished stainless steel drop down door with two (2) non-locking flush lift and turn latches with louvers for ventilation on the forward face of the seat riser.

The compartment interior will be painted spatter gray.

Compartment Light

There will be four (4) white On Scene Solutions Night Axe LED strip lights, one (1) each hinged side of lower and upper exterior compartment door openings. The lights will be controlled by an automatic door switch.

CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

CAB INTERIOR PAINT

The following metal surfaces will be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer (not applicable for recessed dash)
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces will be painted gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

DEFROST/AIR CONDITIONING SYSTEM

A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

Cab Defroster

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

- One (1) adjustable will be directed towards the left side cab window
- One (1) adjustable will be directed towards the right side cab window
- Six (6) fixed outlets will be directed at the windshield

The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

Cab/Crew Auxiliary Heater

There will be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat risers with a dual scroll blower. An aluminum plenum incorporated into the cab structure used to transfer heat to the forward positions.

Air Conditioning

A 19.10 cubic inch compressor will be installed on the engine.

A roof-mounted condenser with a 78,000 BTU output at 2,400 SCFM that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover to be painted to match the cab roof.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the forward plenum cover per the following:

- Four (4) will be directed towards the seating position on the left side of the cab
- Four (4) will be directed towards the seating position on the right side of the cab

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Five (5) will be directed towards crew cab area

A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be hinged with two (2) thumb latches.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

Climate Control

An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.



The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

Gravity Drain Tubes

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

AIR CONDITIONING CONDENSER BRUSH GUARD/COVER

A brush guard/cover will be provided over the air conditioning condenser, on the cab roof. The brush guard will protect the air conditioning condenser from tree limbs, etc. The guard will also allow a fire fighter or maintenance personnel to step over the condenser without damaging the fiberglass housing.

The brush guard/cover will be constructed of aluminum treadplate. The guard will have several 1.00" x 2.00" knockouts to allow for adequate airflow around condenser.

SUN VISORS

Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side and passenger side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 20.00" wide x 8.25" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SEATING CAPACITY

The seating capacity in the cab will be five (5).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

- A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.

FORWARD FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) forward facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEAT

There will be one (1) forward facing, Pierce PS6® seat provided at the center position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following feature incorporated into the side roll protection system:

- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) forward facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.50 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

SEAT UPHOLSTERY

All seat upholstery will be gray Turnout Tuff material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of four (4) SCBA brackets.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats will include a 3-point shoulder type belts only.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of five (5) seating positions will have the adjustable shoulder harness.

HELMET HOLDER

There will be a total of five (5) Zico, Model UHH-1, helmet holder bracket(s) provided in the cab. The brackets will provide secure storage and quick access to each helmet. The location of the helmet holder bracket(s) will be determined at the time of final inspection.

CAB DOME LIGHTS

There will be six (6) Weldon 808* series, dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and four (4) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white.

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker ST™, Model 30**4ST, white LED spotlights located on the cab roof, on each side. The spotlights will be mounted on painted pedestals.

These lights may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver overhead and one (1) within reach of the officer overhead.

HAND HELD LIGHT

There will be four (4) Streamlight, Fire Vulcan, Model #44451, hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted shipped loose.

Each light housing will be orange in color and be provided with a C4, LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

Gauges

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)
 - Low volts (11.8 VDC)
 - Amber indicator on gauge assembly with alarm
 - High volts (15 VDC)
 - Amber indicator on gauge assembly with alarm
 - Very low volts (11.3 VDC)
 - Amber indicator on gauge assembly with alarm
 - Very high volts (16 VDC)
 - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel level gauge (Empty - Full in fractions)
 - Low fuel (1/8 full)
 - Amber indicator on gauge assembly with alarm
 - Very low fuel (1/32) fuel
 - Amber indicator on gauge assembly with alarm
- Engine oil pressure gauge (PSI)
 - Low oil pressure to activate engine warning lights and alarms
 - Red indicator on gauge assembly with alarm
- Front air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm

- Red indicator on gauge assembly with alarm
- Rear air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm
 - Red indicator on gauge assembly with alarm
- Transmission oil temperature gauge (Fahrenheit)
 - High transmission oil temperature activates warning lights and alarm
 - Amber indicator on gauge assembly with alarm
- Engine coolant temperature gauge (Fahrenheit)
 - High engine temperature activates an engine warning light and alarm
 - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
 - Low fluid (1/8 full)
 - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

Indicator Lamps

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt

- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

Alarms

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for 3 to 5 seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

Indicator Lamp and Alarm Prove-Out

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

Control Switches

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for 3 to 5 seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

Custom Switch Panels

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

Diagnostic Panel

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

Cab LCD Display

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqué. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed

in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

HOURMETER - AERIAL DEVICE

An hourmeter for the aerial device will be provided and located within the cab display or instrument panel.

AERIAL MASTER

There will be a master switch for the aerial operating electrical system provided.

AERIAL PTO SWITCH

A PTO switch for the aerial with indicator light will be provided.

SPARE CIRCUIT

There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate two in the front of the cab behind panel #9
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate in the officer overhead console
- Termination will be with 3/8" studs and plastic covers
- Wires will be sized to 125% of the protection

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be protected to 15 amps at 12 volts DC.
- Power and ground will terminate on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical.
- Termination will be with 15 amp, power point plug with rubber cover.
- Wires will be sized to 125 percent of the protection.

This circuit(s) may be load managed when the parking brake is set.

DASH PANEL RECESS

The dash panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The recess will be 7.25" down x 7.81" back and 20.88" wide.

INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

General Screen Design

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition

- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

Home/Transit Screen

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

On Scene Screen

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

Virtual Buttons

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

Page Screen

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock
 - Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)
 - Load Manager
 - A list of items to be load managed will be provided. The list will provide a description of the load.
 - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
 - The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.
 - Systems
 - Command Zone
 - Module type and ID number
 - Module Version
 - Input or output number
 - Circuit number connected to that input or output
 - Status of the input or output
 - Power and Constant Current module diagnostic information
 - Foam (if equipped)
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
 - Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam (if equipped)
 - Aerial (if equipped)
- Setup
 - Clock Setup
 - Date & Time
 - 12 or 24 hour format
 - Set time and date
 - Backlight
 - Daytime
 - Night time
 - Sensitivity

- Unit Selection
- Home Screen
- Virtual Button Setup
- On Scene Screen Setup
- Configure Video Mode
 - Set Video Contrast
 - Set Video Color
 - Set Video Tint
- Do Not Move
 - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated
 - Driver Side Cab Door
 - Passenger's Side Cab Door
 - Driver Side Crew Cab Door
 - Passenger's Side Crew Cab Door
 - Driver Side Body Doors
 - Passenger's Side Body Doors
 - Rear Body Door(s)
 - Ladder Rack (if applicable)
 - Deck Gun (if applicable)
 - Light Tower (if applicable)
 - Hatch Door (if applicable)
 - Stabilizers (if applicable)
 - Steps (if applicable)
- Notifications
 - View Active Alarms
 - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
 - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

COLLISION MITIGATION

There will be a HAAS Alert®, Model HA5 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA5 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degree C to 85 degree C.

The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA5 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA5 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA5 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
 - and there is any occupant seated but not buckled or any belt buckled with an occupant.
 - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

RADIO ANTENNA MOUNT

There will be three (3) standard antenna-mounting base(s), Model MATM, with 17 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount will be located on the cab roof, just to the rear of the officer seat and the additional mount(s) will be located one on passenger front corner of raised roof and one in each rear corner of the crew cab roof. The cable(s) will be routed routed to the office seat box .

VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI, camera
- One (1) amplified speaker (if applicable)
- All necessary cables

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to

protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

Solid-State Control System

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

Circuit Protection and Control Diagram

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

On-Board Advanced/Visual Electrical System Diagnostics

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

Tech Module with WiFi

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

Prognostics

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

Advanced Diagnostics

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

Indicator Light and Alarm Prove-Out System

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

Voltage Monitor System

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

Dedicated Radio Equipment Connection Points

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

Enhanced Software

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for 10 seconds for improved visibility after the doors close. The dome lights will dim after 10 seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for 10 seconds for improved visibility after the doors close. The dome lights will dim after 10 seconds or immediately if the vehicle is put into gear.

EMI/RFI Protection

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be five (5) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 1140 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The

compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.

Battery charger will be Location LS5 rearward wall mounted as high as possible, see photo in Job E-Folder.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-55-15-120, 15 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus without the use of the generator.

The shoreline inlet(s) will include yellow weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to the battery charger and six place receptacle strip in the cab.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

COVER IO MODULE

A cover will be fabricated and installed to the rear face of the driver side battery box to cover the electrical IO modules for protection. The cover will protect the modules from the outside elements as much as possible without having to be water tight.

ALTERNATOR

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

RADIO ANTENNA MOUNT ON BODY

There will be one (1) NMO/TAD mobile antenna mount with Type N-female connector located on the apparatus body at the rear of the truck centered over the traffic advisor on passenger side with 100 feet of LMR240 Ultraflex coax cable with a Type-N male connector routed from the antenna mount to routed to the officer side seat box.

WEATHER PACK CONNECTORS SEALED

All unused open Weather Pack connectors will be plugged with mating tower and shroud connectors and cavity plugs.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

The exception to this will be the fuel sender terminal. The fuel sender terminal will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - If enabled:
 - "Load Man Hi-Idle On" will display on the information center.
 - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
 - ON = not shed
 - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

INTERMEDIATE LIGHT

There will be two (2) Truck-Lite®, part number 303757Y, 2.24" diameter lights with amber LEDs, grommet mount and chrome cover furnished, one (1) each side in the rear fender panel. The light will double as a turn signal and marker light.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

PLATFORM CLEARANCE/MARKER/ID LIGHTS

There will be five (5) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed on the front of the aerial basket, centered.
- Two (2) amber LED clearance/marker lights will be installed, one (1) on each corner of the aerial basket visible from the side and the front of the vehicle.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 35200R, LED lights used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

MARKER LIGHTS

There will be one (1) pair of amber and red LED marker lights with rubber arm, located at the rear most lower corner of the body. The amber lens will face the front and the red lens will face the rear of the truck.

These lights will be activated with the running lights of the vehicle.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights will be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges.

There will be two (2) Whelen Model M6BUW, LED backup lights with chrome trim provided.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket located below the tailboard on a removable bolt-on bracket located driver side.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.

A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an audible alarm with volume control integrated into the display.

PERIMETER SCENE LIGHTS, CAB

There will be a Truck-Lite®, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab access door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits. The lights will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

Each light will be installed in an angle bracket, and be mounted high on the angled portion of each cab access step.

BODY PERIMETER SCENE LIGHTS

There will be two (2) Truck-Lite, Model 44308C, 4.00" LED lights with Model 40700, grommets provided.

The lights will be mounted in the following locations:

- One (1) light under the driver's side turntable access steps
- One (1) light under the passenger's side turntable access steps

The perimeter scene lights will be activated when a switch within reach of the driver is activated.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model PCPSM2*, 16,000 lumens 12 volt DC powered light(s) with white LEDs installed on the cab located, behind driver side cab door, high as possible.

The surface mount housing(s) will be provided with a chrome cover.

The light(s) will be activated by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

The light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model PCPSM2*, 16,000 lumens 12 volt DC powered light(s) with white LEDs installed on the cab located, behind passenger side cab door, high as possible.

The surface mount housing(s) will be provided with a chrome cover.

The light(s) will be activated by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

The light(s) may be load managed when the parking brake is applied.

DECK LIGHTS

There will be two (2) Whelen®, Model MPPBCS, black with chrome housing 12 volt DC LED floodlights with on/off switch. Each light will be provided with a low profile pedestal/swivel mount provided at the rear of the hose bed, one (1) each side.

The lights will be activated by the switch included on the light(s).

REAR SCENE LIGHT(S)

There will be two (2) Whelen®, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, one (1) high on the driver's side rear body bulkhead and one (1) high on the passenger's side rear body bulkhead.

The light(s) will be controlled by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.

WALKING SURFACE LIGHTS

There will be One (1) Amdor®, Model AY-LB-12HW0**, white 12 volt DC LED strip light(s) provided in the cargo area(s) to illuminate the interior surface of the cargo area(s). Light(s) will be front of cargo area.

The light will be activated when the body step lights are on.

CARGO AREA

The cargo area will be fabricated of .125" 5052 aluminum with a 38,000 psi tensile strength.

The sides will not form any portion of the fender compartments.

The upper edges of the side panels will have a double break for rigidity.

The cargo area will be located ahead of the ladder turntable.

Flooring of the cargo area will be aluminum treadplate.

The hose bed/cargo area interior will be painted to match the lower body color..

HOSE BED CROSS DIVIDER

There shall be one (1) cross divider(s) provided in the hose bed at the front of the hose bed, match 31433. This cross-divider shall include a series of knock-outs in it to allow air to pass through for cooling.

TURNTABLE STEPS

Steps to access the turntable from the left and right side will be provided just behind the compartmentation. The steps will be a swing-down design, with the stepping area made of Morton Tread-Grip® channel. The step height for the bottom step (the distance from the top surface of the step to the ground) will not exceed 24.00" with the step in its extended position. No step height (the distance between the top surfaces of any two (2) adjacent steps) will be greater than 14.00". The stepwell will be lined with bright aluminum treadplate to act as scuffplates. The steps will be connected to the "Do Not Move Truck" indicator. A vertical only handrail will be provided on each side of the access steps. The sides of each step package will be modified to allow the rear most handrail on each side to be recessed. The rear handrails will not protrude past the body side sheets or above the rear deck. A hand hold will be provided in the left and right side of each set of access steps.

STEP LIGHTS

There will be three (3) white LED step lights provided for each set of aerial turntable access steps.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The step lights will be actuated by the aerial master switch in the cab.

SMOOTH ALUMINUM REAR WALL

The rear wall will be smooth aluminum.

TOW EYES

Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the torque box. The inner and outer edges of the tow eyes will be radiused.

COMPARTMENTATION

Compartmentation will be fabricated of .125" 5052 aluminum.

The side compartments are an integral assembly with the rear fenders. Fully enclosed rear wheel housings will be provided to prevent rust pockets and for ease of maintenance. Due to the severe loading requirements of this aerial, a method of compartment body support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rail, which is the strongest component of the chassis and is designed for sustaining maximum loads.

A support system will be used which will incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators will have a broad range of proven viability in vehicular applications, be of a fail safe design, and allow for all necessary movement in three (3) transitional and rotational modes. This will result in a 500 pound equipment rating for each lower compartment of the body.

The compartmentation in front of the rear axle will include a 3.00" steel support assemblies which are bolted to the chassis frame rails. A steel framework will be mounted to the body above these support

assemblies connected to the support assemblies with isolators. There will be one support assembly mounted to each chassis frame rail.

The compartmentation behind the rear axle will include 3.00" steel support assemblies which are bolted to the chassis frame rails and extend underneath to the outside edge of the body. The support assembly will be coated to isolate the dissimilar metals before it is bolted to the body. There will be one support assembly mounted to each chassis frame rail.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. The compartment door openings are framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection is provided over all door openings by means of bright aluminum extrusion or formed bright aluminum treadplate. Side compartment tops will be covered with bright aluminum treadplate with a 1.00" rolled over edge on the front, rear and outward side. The covers are fabricated in one piece and have the corners "Tungsten Inert Gas" welded. A bright aluminum treadplate cover will be provided on the front wall of each side compartment. All screws and bolts, which protrude into a compartment, will have acorn nuts at the ends to prevent injury.

The body design has been fully tested. Proven engineering and test techniques such as finite element analysis, model analysis, stress coating and strain gauging have been performed with special attention given to fatigue life and structural integrity of the compartment body and substructure.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

All body compartments will have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers will be formed into the metal and not added to the compartment as a separate plate.

COMPARTMENT IN PLACE OF PUMP

A roll-up door compartment will be installed in place of the pump and pump panel.

The compartment will be approximately 30.25" wide x 64.00" high x 24.50" deep in the lower area and transversed in the top portion of the compartment. The transversed area will be 22.50" wide x 47.00" high.

The door opening will be approximately 27.25" wide x 56.38" high.

The forward wall will be notched for the boom support.

COMPARTMENTATION, DRIVER SIDE

A full height roll-up door compartment, ahead of the rear wheels, will be provided. The compartment will be 41.75" wide x 64.00" high x 24.25" deep with a clear door opening of 38.75" wide x 56.38" high.

One (1) roll-up door compartment will be located above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep with a clear door opening of 63.75" wide x 25.50" high.

The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be 24.25" wide x 15.50" high x 24.25" deep with a door opening of 18.50" wide x 12.75" high.

A full height roll-up door compartment, behind the rear wheels, will be provided. The compartment will be 43.75" wide x 49.25" high x 21.25" deep with a door opening of 40.75" wide x 41.62" high.

There will be one (1) roll-up door compartment located below the turntable. The compartment will be 39.38" wide x 18.38" high x 21.25" deep with a door opening of 33.75" wide x 11.75" high.

The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

COMPARTMENTATION, PASSENGER SIDE

A full height roll-up door compartment, ahead of the rear wheels, will be provided. The compartment will be 41.75" wide x 64.00" high x 24.25" deep with a clear door opening of 38.75" wide x 56.38" high.

One (1) roll-up door compartment will be located above the fender compartments and over the rear axles. The compartment will be 72.13" wide x 33.25" high x 24.25" deep with a clear door opening of 63.75" wide x 25.50" high.

The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

A compartment with a single pan stainless steel door will be located above the front stabilizer. The compartment will be 24.25" wide x 15.50" high x 24.25" deep with a door opening of 18.50" wide x 12.75" high.

A full height roll-up door compartment, behind the rear wheels, will be provided. The compartment will be 43.75" wide x 49.25" high x 21.25" deep with a door opening of 40.75" wide x 41.62" high.

There will be one (1) roll-up door compartment located below the turntable. The compartment will be 39.38" wide x 18.38" high x 21.25" deep with a door opening of 33.75" wide x 11.75" high.

The retracted roll-up door will consume approximately 8.00" in height and 12.00" in depth of the upper outboard portion of each compartment.

SIDE COMPARTMENT ROLLUP DOORS

There will be ten (10) compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand rollup doors.

Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects

the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A stainless steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded roll-up door wear components will be constructed of Type 6 nylon.

Each roll-up door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the roll-up door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

BODY MODIFICATION

The mobile awareness sensor wires will be routed through the back wall. There will be holes with a grommets in the back wall for the wires to go directly through to the bumper. The wires will not be routed underneath the wall.

COMPARTMENT BLISTER

A blister in the compartment ahead of the rear wheels will be provided to clear the front bracket of the Firemax suspension. This blister will take away some of the interior area of the compartment.

REAR BUMPER

A 5.00" rear bumper will be furnished. Bumper will be constructed of steel framework and will be covered with polished aluminum treadplate. The treadplate will stop at the base of the steel framework, not extending underneath. The bumper will be 4.00" deep x 4.75" high and will be spaced away from the body approximately 1.00". It will extend the full width of the body.

REDUCED HEIGHT RUBBER DOOR STOP

The black rubber stops provided above the horizontal door ledge on the roll up doors located LS2 and RS2 will be trimmed so that the door can be opened as much as possible.

COMPARTMENT LIGHTING

There will be eleven (11) compartments with On Scene Solutions LED compartment light strips. The compartments with these strip lights will be located all body compartment including torque box. Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening. The lights will be sized to accommodate the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door, will automatically turn the compartment lighting on.

COMPARTMENT LIGHTING, ADDITIONAL

There will be two (2) On Scene Solutions, Model Night Stik LED light(s) provided in the compartment(s) located LS5 and RS5 outrigger compartments. Each light will be 9.00" in length.

Opening the compartment door(s) will automatically turn the compartment lighting on.

MOUNTING TRACKS

There will be six (6) sets of tracks for mounting shelf(s) in LS1, LS3, LS4, RS1, RS3 and RS4. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be six (6) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location(s) will be in RS3 centered between the floor and the ceiling, in RS4 in the upper third, in RS1 in the upper third, in LS3 centered between the floor and ceiling, in LS4 in the upper third and in LS1 in the upper third.

TRANSVERSE COMPARTMENT OVER TORQUE BOX

one (1) upper forward body compartments will be transverse over the torque box, to the opposite side of the body. The transverse area will be 19.25" high x 68.00" deep and as large as possible, per engineering a 15.25" recess in the forward section is required for generator mounting between forward outriggers. The compartment D4/P4 compartment will include this transverse option.

RUB RAIL

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

The rub rails will be spaced out far enough to protect the lift bars on the rollup doors.

BODY FENDER CROWNS

Stainless steel fender crowns will be provided around the rear wheel openings.

A rubber welting will be provided between the body and the crown to seal the seam and restrict moisture from entering.

SINGLE AIR BOTTLE STORAGE COMPARTMENT

A quantity of seven (7) air bottle compartments, 7.75" in diameter x 26.00" deep, will be provided on the left side, two single compartments between the tandem rear wheels, on the right side, two single compartments between the tandem rear wheels, on the left side forward of the rear wheels, on the left side rearward of the rear wheels and on the right side rearward of the rear wheels. A polished stainless steel door with a chrome plated flush lift & turn latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

EXTENSION LADDER

There will be one (1) 35', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder(s) provided.

ADDED EXTENSION LADDER

There will be a 28', two (2) section, aluminum, Duo-Safety Series 1200-A extension ladder provided.

EXTENSION LADDERS, AERIAL

There will be one (1) 28', two (2) section, aluminum, Duo-Safety, Series 1200-A extension ladder provided.

ROOF LADDER

There will be two (2) 16' aluminum Duo-Safety Series 875-A roof ladder(s) provided.

ADDED ROOF LADDER

There will be one (1) aluminum, 14' Duo Safety 875-DR roof ladder with 7/8" hooks provided aerial fly section.

AERIAL FOLDING LADDER

There will be one (1) 10' aluminum Duo-Safety Series 585-A folding ladder(s) provided and located in the aerial torque box.

GROUND LADDER STORAGE

The ground ladders are stored within the torque box and are removable from the rear.

Ladders will be enclosed to prevent road dirt and debris from fouling or damaging the ladders.

The ladders rest in full length stainless steel slides and are arranged in such a manner that any one ladder can be removed without having to move or remove any other ladder.

The rear most vertical support will be moved forward to allow hand clearance to access ladders.

A Gortite roll-up door will be provided at the rear, double faced, aluminum construction and an anodized satin finish. The latching mechanism will consist of a full length lift bar lock with latches on the outer extrusion of the door frame.

A stainless plate with a two bend flange and a stainless steel hinge will be provided to secure the aerial ladder complement. The plate assembly will be mounted to the bottom of the entrance of the torque box ladder storage area along with a polyethylene wear plate to prevent ladders from being scuffed by contacting metal parts.

When the plate is vertical, it will secure the ladders and prevent them from migrating to the rear of the apparatus. When the plate is down, the roll-up door cannot close, which will activate the "Open Door Indicator Light" within the cab. The roll-up door, together with hinge friction, will secure the plate in place during driving operations.

A door guard will be provided to prevent tools inside the torque box from damaging the roll-up door.

ADDITIONAL FOLDING LADDER

One (1) 17' aluminum Super Duty Type 1AA Little Giant folding ladder will be provided. The stored dimensions will be 55.00" high x 25.00" wide x 8.00" deep. The weight will be 45lb. Capacity of 375lb.

The ladder will be located ship loose.

DURA-SURF LADDER SLIDES

Black Dura-Surf friction reducing material will be added to the all torque box ladder storage troughs on the bottom horizontal surfaces, of the ladder troughs.

NESTED LADDER STORAGE

There will be nested ladders on the right side of the ladder storage compartment.

PIKE POLE, 3'

Two (2) pike poles 3' long Duo-Safety, with "D" handle, will be provided and shall be located ship loose along with the two (2) 3' Fire Hooks Unlimited pike poles.

PIKE POLES

There will be two (2) 12 foot pike pole(s) with fiberglass handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE, 8'

Two (2) pike poles, 8' long DUO Safety with a fiberglass handle, will be provided and located torque box.

PIKE POLE 6 FT

There will be two (2) 6 foot pike pole(s) with fiberglass handles provided. The pike pole(s) will be stored in tubular holders located in the ground ladder storage compartment.

PIKE POLE 3 FT

There will be two (2) Fire Hooks Unlimited National Hook pike pole(s), with D-handle and fiberglass pole provided.

PIKE POLE STORAGE IN TORQUE BOX/LADDER STORAGE

There will be ABS tubing provided in the torque box/ladder storage area for a total of six (6) pike poles.

If the head of a pike pole can come into contact with a painted surface, a stainless steel scuffplate will be provided.

CARGO COMPARTMENT COVER

A 22 oz yellow vinyl cargo compartment cover will permanently fastened at the front and furnished with bungee cord and hook with pull tabs fasteners on the sides and bungee cord and hook with pull tabs fasteners at the rear. The fasteners will be 12.00" apart at the sides and rear.

AIR HORN SYSTEM

Two (2) Hadley round air horns with 6.00" bell will be recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL

The air horn(s) will be activated by the following:

- Left side foot switch
- Right side foot switch

AUXILIARY MECHANICAL SIREN

There will be a Federal Signal Model Q2B mechanical siren furnished and installed in the front of the apparatus.

The Q2B will be chrome finish.

The siren will have a 2-gauge cable connected to a power solenoid that is connected by a 2-gauge cable ran battery direct to the primary chassis batteries and will be labeled Q2B+ at the battery. The power solenoid will only be enabled when the emergency master switch is on.

The siren will have a 2-gauge ground wire connected to the chassis battery stud. The cable will be labeled Q2B- at the battery.

When the chassis battery switch is on, and the emergency master switch is on, the Q2B siren will be activated by the following:

The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

MECHANICAL SIREN CONTROL

The mechanical siren will be activated by the following:

- Steering wheel horn ring with horn/siren selector switch.
- Right side foot switch.

A momentary red switch will be included in the left side overhead switch panel to activate the siren brake.

GROUND STRAP FROM Q2B TO GROUND STUD

A ground wire will be added to the Q2B siren. The ground wire will run directly from the siren motor to the battery ground stud located by the left side batteries.

ACTIVATION FOR WARNING LIGHTS INTENSITY

When parking brake is released, the designated Whelen® warning lights on the cab and the warning lights on the body will transition to a low power intensity. The flash pattern will not be affected.

In order for the activation of low power mode of the warning lights, the battery switch, the ignition switch, the emergency master switch, must be on, and the parking brake released.

The low power intensity mode will be reset when any of the above conditions are not met.

FRONT ZONE UPPER WARNING LIGHTS

There will be eight (8) Whelen® Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights with chrome trim provided on the cab roof. There will be a left side and right side housing installed to hold the lights perpendicular to the cab roof and conceal all the wiring. A removable cover will be installed for maintenance. The brackets will be painted the same color as the cab roof.

The lights will be installed per the following:

- One (1) red LED module installed in the left side facing end position
- One (1) red LED module installed in the left side facing second position
- One (1) red LED module installed in the left side corner position
- One (1) red LED module installed in the left side front position
- One (1) red LED module installed in the right side front position
- One (1) red LED module installed in the right side corner position
- One (1) red LED module installed in the right side facing second position
- One (1) red LED module installed in the right side facing end position

- The warning light lens color(s) to be clear

There will be a switch in the cab on the switch panel to control the lights.

The two (2) front facing LED modules will be de-activated when the park brake is disengaged.

The forward facing red LEDs may be load managed when the parking brake is applied.

FRONT ZONE UPPER LIGHTING, PLATFORM

Two (2) Whelen model M6R, red flashing LED lights will be located at the front of the platform basket facing forward. The color of the lenses will be the same color as the LED's.

These lights are required to meet or exceed the NFPA Front upper zone optical warning light requirements.

These lights will be deactivated when the ladder is lifted from the stowed position.

The lights will be controlled by the same switch as the lightbars. The switch will be provided on the cab instrument panel.

The lights will be located one in front of each monitor, just below the clears, see picture of previous unit in Job 24895 and be provided with with a flange.

ADDITIONAL WARNING LIGHTS

There will be two (2) Whelen, Model M6* LED flashing warning light(s) that include a chrome flange, located on the basket, forward of each monitor, clear on top red on bottom, see photo of 24895.

The color of these lights will be white and include a lens that is clear.

The light(s) will be activated with the roof light switch and be deactivated when the boom is lifted out of the cradle.

The additional warning light(s) may be load managed if colored or will be deactivated if white, when the parking brake is set.

ADDITIONAL WARNING LIGHTS

There will be four (4) Whelen, Model M6* LED flashing warning light(s) that include a chrome flange, located on the basket, each side of the basket on the door will be two (2) red lights side by side, , see picture of previous unit in Job 24895.

The color of these lights will be red and include a lens that is the same color as the LED's.

The light(s) will be activated with the roof light switch and be deactivated when the boom is lifted out of the cradle.

The additional warning light(s) may be load managed if colored or will be deactivated if white, when the parking brake is set.

TRAFFIC LIGHT CONTROLLER

There will be a GTT, Model 792* strobe Opticom traffic light controller with national standard high priority remote mounted on the front edge of the platform basket, center of platform basket.

The Opticom traffic light controller will be activated by a cab switch with emergency master control.

The Opticom traffic light controller will have no momentary activation switch.

The Opticom traffic light controller will be disabled when the parking brake is applied.

COVER, TRAFFIC LIGHT CONTROLLER

There will be an aluminum treadplate cover provided over the Opticom traffic light controller for protection.

CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning lights installed on the cab face, above the headlights in a housing that matches the headlights per the following:

- The left side outside warning light to include red LEDs.
- The left side inside warning light to include white LEDs.
- The right side inside warning light to include white LEDs.
- The right side outside warning light to include red LEDs.
- The warning light lens colors to be the same as the LEDs.
- The housing to be polished and the trim shall be chrome.

The lights will be controlled per the following:

- A switch in the cab, on the switch panel will control the lights.
- White LEDs will be deactivated when the parking brake is applied.
- Amber LEDs will be deactivated when the parking brake is released.
- Amber, blue, green or red LEDs in the inside positions may be load managed when the parking brake is applied.

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights located, one (1) each side on the bumper extension. The driver's side, side front light to include red warning LEDs and the passenger's side, side front light to include red warning LEDs.
- Two (2) lights located, one (1) each side above the front wheels. The driver's side, side middle light to include blue warning LEDs and the passenger's side, side middle light to include blue warning LEDs.
- Two (2) lights located, one (1) each side located between the tandems. The driver's side, side rear light to include red warning LEDs and the passenger's side, side rear light to include red warning LEDs.

- The warning light lens colors to be the same as the LEDs.

There will be a switch in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided on the cab corner(s) per the following:

The light(s) to include red flashing LEDs and the lens color(s) to be the same as the LEDs.

The light(s) will be mounted on a 45 degree angled polished stainless steel bracket(s).

The light(s) may be controlled with the side warning switch.

- White LEDs will be deactivated when the parking brake is applied
- Amber LEDs will be activated when the parking brake is applied
- Amber, blue or red LEDs may be load managed when the parking brake is applied

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen®, Model M6* LED flashing warning lights with chrome trim located at the rear of the apparatus.

- The driver's side rear light to be red
- The passenger's side rear light to be red

The lens color(s) to be the same as the LEDs.

There will be a switch located in the cab on the switch panel to control the lights.

The light(s) will have the low intensity mode wire connected to the controlling circuit.

REAR WARNING LIGHTS

There will be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided at the rear of the apparatus, above the taillights.

The light(s) to include blue flashing LEDs. The warning light lens colors to be the same as the LEDs.

These light(s) will be controlled with the rear upper warning switch.

The light(s) may be load managed when the parking brake is applied.

The light(s) will have the low intensity mode wire connected to the controlling circuit.

REAR OF HOSEBED WARNING LIGHTS

There will be two (2) Whelen, Model B6M7**1P Super LED beacon with lower LED flashing warning lights provided at the rear of the truck, one (1) each side.

Each light will include a Super LED flashing beacon and a Whelen, Model M7* LED flashing light, mounted in a polished aluminum housing.

The beacons will have red LEDs and be provided with both domes red.

The color of the Whelen, Model M7* LED flashing lights will be amber and include a lens that is the same color as the LED's .

A switch will be provided in the cab, on the switch panel to control the beacons. The lower Whelen, M7* LED lights will be activated with the rear upper warning switch.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAL85 46.87" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The lens color will be clear.

The control head will be included with this installation. The control head will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be surface mounted over the rear door, inside a treadplate box at the rear of the apparatus as high as practical.

The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the driver's side.

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

The following guidelines will apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus 3 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase
- Rated frequency
- Rated amperage
- Continuous rated watts
- Power source engine speed

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144.00" (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows.

- Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit will be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.

Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location will be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30.00" (762 mm) from the ground.

The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30.00" (762 mm) above the interior floor height.

All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked.

Listing

All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

Electrical System Testing

The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

Operational Test per Current NFPA 1901 Standard

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by an independent third-party certification organization.

The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

GENERATOR

The apparatus will be equipped with a complete AC (alternating current) electrical power system. The generator will be a Harrison Model 6.0MAS-16R/D-11011/15/1, 6,000 watt hydraulic driven unit.

The generator will be driven by a transmission power take off unit, through a hydraulic pump and motor.

The hydraulic engagement supply will be operational only after the chassis parking brake is engaged and transmission is in neutral.

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

Generator Instruments and Controls

To properly monitor the generator performance a digital meter panel will be furnished and mounted near the circuit breaker panel.

GENERATOR LOCATION

The generator will be permanently mounted above the torque box area between the forward outriggers.

GENERATOR START

There will be a switch provided on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL

The circuit breaker panel will be located high on the back wall of compartment LS6 to the left side.

DIGITAL METER PANEL

The generator meter panel will be installed D6 body compartment on forward wall - see photos on S:drive inside a compartment, in place of the standard location. The digital meter panel will be on anytime the generator is running.

120 VOLT LIGHTING

There will be Two (2) Whelen®, Model PCP2AP*, 120 volt AC LED light(s) and Model PBAPEDA, pedestal mounting bracket(s) installed one (1) each side at the rear of the compartments D3 and P3.

The painted parts of this light assembly to be white.

The light(s) selected above will be controlled by the circuit breaker(s) located in the breaker panel as well as the following:

- no additional switch location
- no additional switch location
- a switch located next to the circuit breaker panel
- no additional switch location

ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system will be a Hannay, Series 1600, cord reel. The reel will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer.

A Nylatron guide to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel will be provided one (1) in compartment D6 from ceiling.

The cord reel will be configured with three (3) conductors.

CORD

Provided for electric distribution will be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. No connector will be installed on the end of the cord.

PORTABLE JUNCTION BOX

There will be one (1) Akron EJBX electric junction box(es) provided.

There will be a cable strain relief and direct connection, no plug provided for each box.

Each box will be provided with the following:

- four (4) 15/20 amp 120 volt AC duplex straight blade receptacles with flip up covers
- a 120 volt AC light inside the box

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided along the back of the engine dog house tied up loose (see photo).

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided in D2 (see photo) mounted high across the top rear corner.

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

120 VOLT RECEPTACLE

There will be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with exterior flip up cover(s), installed one at the rear of the body on passenger side. The NEMA configuration for the receptacle(s) will be 5-20R.

The receptacle(s) will be powered from the on board generator.

There will be a label installed near the receptacle(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

THREE SECTION 100 FOOT AERIAL PLATFORM

GENERAL INFORMATION

It is the intent of these specifications to describe a telescoping, elevating platform. The unit will consist of a three (3) section, steel ladder with a self-leveling basket attached, to the ladder fly section.

OPERATION ON GRADES

The aerial unit will be capable of operating safely, on any slope up to 10 degrees at full capacities. (Operation beyond this limit will be at the operator's discretion.)

CONSTRUCTION STANDARDS

The ladder will be constructed to meet all of the requirements as described in current NFPA 1901 standard.

These capabilities will be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material will have a design stress of not more than 50% of the minimum yield strength of the material based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the current NFPA 1901 standard.

All structural load supporting elements of the aerial device that are made of non-ductile material will have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA 1901 standard.

The aerial device will be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device will be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle in the in the fully extended position at zero degrees elevation, a test load will be applied in a horizontal direction normal to the centerline of the ladder. The turntable will not rotate and the ladder will not deflect beyond what the product specification allows.

All welding will be in compliance with the American Welding Society standards. All welding personnel will be certified, as qualified under AWS welding codes.

All material and welds will have a structural safety factor of 2:1. This will be derived from taking into account structure weight, payload, wind load, ice load, and nozzle reactions.

The aerial device will be capable of operating in wind conditions of up to 50 mph and icing conditions of up to a .25" coating over the aerial structure.

All of the design criteria must be supported by the following test data:

- Strain gage testing of the complete aerial device
- Analysis of deflection data taken while the aerial device was under test load

The following standards for materials are to be used in the design of the aerial device:

- Materials are to be certified by the mill that manufactured the material
- Material testing that is performed after the mill test will be for verification only and not with the intent of changing the classification.

LADDER CONSTRUCTION

The ladder will be comprised of three (3) sections and will extend to a nominal height, of 100 feet above the ground, as measured by 1901 recommendations. The ladder (handrails, baserails, trusses, k-braces and rungs) will be constructed of welded, high strength steel certified by the manufacturer as being a minimum of 70,000 pounds per square inch of yield strength. Each section will be trussed diagonally, vertical and horizontally using round steel tubing. All critical points will be reinforced, for extra rigidity, and to provide a high strength-to-weight ratio. All ladder rungs will be round and welded to each section in two (2) places with "K" bracing for lateral and torsional rigidity.

The inside width dimensions of the ladder will be:

- Base Section 38.75"
- Mid Section 28.88"
- Fly Section 21.50"

The height of the handrails above the centerline of the rungs will be:

- Base Section 31.31"
- Mid Section 26.82"
- Fly Section 22.75"

VERTICAL HEIGHT

The height of the unit will extend to no less than 100', as measured by a plumb line from the top surface of the basket handrail assembly to the ground, with the basket raised to a 75 degree angle. The aerial device will be measured, in this manner, for accurate comparison.

HORIZONTAL REACH

The rated horizontal reach will be 93'. The measurement of horizontal reach will be consistent with NFPA standards.

MOUNTING OF ELEVATING PLATFORM

The aerial device will be rear mounted, to a torque box, on the truck chassis.

TORQUE BOX

A "torsion box" subframe will be installed between the two sets of stabilizers. The torque box will be constructed of .312" steel plate (50,000 pounds per square inch yield) with steel tubing reinforcement, on each side of the box, in the turntable area. The dimensions of the torque box will be 41.00" wide x 29.00" high x 253.50" long. The torque box subframe assembly will be capable of withstanding all torsional and horizontal loads when the unit is on the stabilizers. The torque box will be bolted to the chassis frame rails using thirty-two .750" SAE grade 8 bolts with nuts.

TURNTABLE

The turntable will be a 1.00" thick steel deck, coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces will meet the skid-resistance requirements of the current NFPA 1901 standard.

The turntable will measure 81.00" long x 96.00" wide. The turntable will include an enclosure for the hydraulic valves and rotation motor, which will also serve as a step, for access to the ladder.

The turntable handrails will be a minimum 42.00" high and will not increase the overall travel height of the vehicle. The handrails will be constructed from aluminum and have a slip resistant knurled surface.

ELEVATION SYSTEM

Two (2) double acting, lift cylinders will be utilized to provide smooth, precise elevation from 5 degrees below horizontal to 75 degrees above horizontal. The lift cylinder will be attached to each side of the base section. The lift cylinder rod will be chrome plated, to provide smooth operation of the aerial and reduce seal wear. The lift cylinders will be equipped with integral holding valves located in the cylinder, to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves will NOT be located in the transfer tubes.

The elevation system will be controlled by the microprocessor. The microprocessor will provide the following features:

- Collision avoidance of the elevation system to prevent accidental body damage
- Automatic deceleration when the aerial device is lowered into the cradle
- Automatic deceleration at the end of stroke, in maximum raise and lower positions

- Deceleration of the aerial device from 0 to -5 degrees

EXTENSION/RETRACTION SYSTEM

A hydraulically powered, extension and retraction system will be provided through dual hydraulic cylinders and wire ropes. Each set will be capable of operating the ladder in the event of a failure, of the other. The extension cylinder rod will be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders will be equipped, with integral holding valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves will NOT be located in the transfer tubes.

Wire ropes and attaching systems used to extend and retract the fly sections will have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope will remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used will be 1:12. Wire ropes will be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope will be galvanized to reduce corrosion.

The extension/retraction system will be controlled by the microprocessor. The microprocessor will provide the following features:

- Automatic deceleration at the end of stroke, in maximum extend and retract positions
- Controls the rate of retraction while flowing water

All sheaves will be greaseless and all sheave pins and pivot pins will be polished stainless steel.

ROTATION SYSTEM

A 54.00" external tooth, monorace swing circle bearing will be used for the rotation system and will provide 360 degree continuous rotation. To insure proper bearing installation, both the open base bearing plate and the turntable bearing plate will be milled surfaces. The bearing will be bolted to the turntable and the base plate by a minimum of sixty grade 8, .88" bolts. Two (2) hydraulically driven, planetary gear boxes with drive speed reducers will be used to provide infinite and minute rotation control throughout the entire rotational travel. Two (2) spring applied, hydraulically released disc type swing brakes will be furnished to provide positive braking of the turntable assembly. Provisions will be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system will be equipped with pressure relief valves which will limit the rotational torque to a nondestructive power.

The rotation system will be controlled by the microprocessor. The microprocessor will provide the following features:

- Envelope control of rotation system to prevent accidental body damage
- Prevent the aerial from being rotated into an unstable condition

MANUAL OVERRIDE CONTROLS

Manual override controls will be provided for all aerial and stabilizer functions.

LADDER SLIDE MECHANISM

UHMW polyethylene wear pads will be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads will also be used to control side play between the ladder sections.

BASKET LEVELING SYSTEM

A basket leveling system will be provided and so designed, that the basket with it's rated load, can be supported and maintained level, relative to the turntable, regardless of the elevation or flexion of the ladder.

Basket leveling will be accomplished by hydraulic circuitry, that is independent from the main hydraulic system. The leveling of the basket features a dual master/slave hydraulic cylinder system, with each side capable of supporting the load, while maintaining the basket level. Two (2) master cylinders are mounted between the turntable and the base ladder section, with two (2) slave cylinders mounted between the ladder fly section and the basket. The slave and master cylinders are 100% matched, so as the ladder is raised or lowered, exact amounts of hydraulic fluid are transferred between the master and slave cylinders thus maintaining the basket level.

The hydraulic circuitry includes pressure operated counter balance valves, on the load side of the slave cylinders, to prevent the basket from tipping should the hydraulic lines be severed.

A momentary switch is provided, on the cab instrument panel, to level the basket should this become necessary due to ambient temperature changes. It is not necessary to start the engine and activate the main hydraulic system to level the basket.

ROTATION INTERLOCK

The microprocessor will be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor will allow full and unrestricted use of the aerial, in the 180 degree area, on the side(s) where the stabilizers have been fully deployed. The system will also have a manual override, to comply with NFPA 1901.

LOAD CAPACITIES

The following load capacities will be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities will be based upon full extension and 360 degree rotation.

A load chart, visible at the operator's station, will be provided. The load chart will show the recommended safe load at any condition of the aerial device's elevation and extension.

50 MPH WIND CONDITIONS/DRY

Degrees of Elevation	-5 to 29	30 to 39	40 to 49	50 to 75
Basket	1000	1000	1000	1000
Fly	-	-	250	500
Mid	-	250	500	750
Base	250	500	750	1000

WATER TOWER OPERATION

The following capacities will be based upon continuous 360 degree rotation and full extension.

50 MPH WIND CONDITIONS/WATER CHARGED

Degrees of Elevation	-5 to 29	30 to 39	40 to 49	50 to 75
Basket	500	500	500	500
Fly	-	-	250	500
Mid	-	250	500	500
Base	-	500	500	750

ELEVATION -5 TO +75 DEGREES

The aerial device will be able to maintain the above load capacities while flowing up to 1500 GPM and a nozzle position of 0 to 90 degrees to either side of the ladder centerline, as far above and below horizontal to the platform as nozzle design allows.

While flowing 1500 to 2000 GPM the nozzle position will be limited to 45 degrees either side of the ladder centerline horizontal to the platform, 30 degrees above horizontal, and as far below horizontal to the platform as nozzle design allows.

Reduced loads in the basket can be redistributed in 250 lb. increments to the fly, mid, or base as needed.

LADDER CRADLE INTERLOCK SYSTEM

A ladder cradle interlock system will be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a load supporting configuration. A switch will be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

BOOM SUPPORT

A heavy duty boom support, constructed of steel, is to be provided for support of the ladder in the travel position. The boom support will be bolted to the chassis frame as close to the front axle as design allows. On the base section of the ladder, a stainless steel scuffplate will be provided where the ladder comes into contact with the boom support.

The boom support will be located just to the rear of the chassis cab, recessed into the transverse compartment in place of pump.

AERIAL BOOM SUPPORT LIGHT

There will be one (1) Amdor®, Model AY-LB-12HW012, 190 lumen, 12" long, white LED strip light mounted on the boom support cradle. This light will be activated when the aerial master switch is activated.

AERIAL BOOM PANEL

There will be one boom panel provided on each side of the aerial ladder base section. The boom panel will be painted #20 white.

The boom panels will be designed so no mounting bolts are in the face of the panel. This will keep the lettering surface free of holes.

AERIAL DEVICE RUNG COVERS

Each rung will be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers will be glued to each rung, and will be easily replaceable should the rung cover become damaged.

The center portion of each rung cover will be black and the outside 2.00" edge at each side will be safety yellow.

Under no circumstances will the rung covers be fastened to the rungs using screws or rivets.

The rung covers will have a 10-year, limited warranty.

LADDER STORAGE MOUNTING BRACKETS

There will be brackets that are DA finished provided near the end of the fly section of the aerial for mounting a roof ladder.

The mounting brackets will accommodate a 14' Duo-Safety 875-A-DR roof/wall ladder as determined by the type of aerial device and the available space.

BASKET STRUCTURE

The complete basket structure will be constructed of welded high strength steel certified by the manufacturer to have a minimum of 46,000 pounds per square inch yield strength. Modular construction of the aerial platform basket will allow for easy component replacement should the basket become damaged during use. The aerial basket will be fully tested and independent third party certified.

The flooring and front decking of the basket will be multi-piece Morton Cass material, preventing the accumulation of water on the standing surface. The floor will measure approximately 34.00" long x 92.00" wide. The stepping surfaces will meet the skid-resistance requirements of current NFPA 1901 standard.

The outside basket steps used for transferring in and out of the basket will be at the same level as the basket floor. The steps on the front are approximately 16.00" deep. The front corners of the basket step will be mitered at 45 degrees to allow the basket to be maneuvered closer to buildings when approaching at an angle. A heavy extruded rubber bumper strip will be fastened to the outside edge of the step.

Four (4) stainless steel pompier belt safety loops will be attached to the inside of the basket. Two (2) lifting eyes will be provided on the bottom side of the basket support structure.

Two (2) rubber bumpers are provided on the bottom side of the basket structure for damage protection when setting it down on a surface.

The basket interior will be illuminated as required per the current edition of NFPA 1901. All hoses and wiring at the basket will be fully enclosed. Electrical sub-components will be mounted at the rear of the basket in a separate enclosure for easy servicing while maintaining an unobstructed basket interior.

BASKET SIDES

The sides of the basket will be of solid single pan aluminum construction and, along with the basket doors, will form a continuous 42.00" high wall around the basket. The modular design of the basket will allow for easy replacement of components in case of damage.

BASKET ENTRANCES/EXITS

Two (2) swing-in, spring-loaded, self-closing double pan doors constructed of aluminum will be provided at the front of the basket. The **LyfeLatch™** impact release door latches will be provided on the basket doors. The **LyfeLatch** door latches will allow the basket doors to be opened from outside the basket by applying pressure to the outside of the door, either with the foot or the hand. A treadplate scuffplate will be provided at the bottom exterior of the doors. The rear of the basket will be equipped with a vertical self-closing gate for transfer to and from the basket's ladder device. Telescoping-type handrails will be provided as a banister to bridge the gap between the basket and the fly section at all elevations.

ACCESSORY MOUNTING RECEPTACLES

Two (2) universal accessory mounting receptacles will be permanently affixed on the front of the basket to receive the **LyfeLine™** family of options such as the **LyfeSupport™** rescue basket holders, **LyfeEye™** rappelling arms, **LyfeLadder™** roof ladder brackets, **LyfeHoist™** winch, etc. Complete interchangeability will be required without modification to the basket.

HOSE BOX AT PLATFORM

There will be one (1) hose storage box(es) with a cover and rubber draw latch provided at the platform. A brushed stainless steel scuffplate will be provided under each latch. The box(es) will be located at the right side of the basket when viewed from the turntable and will match the finish of the aerial device. The box(es) will be sized to fit 100' of 1.75" diameter hose.

Drain holes will be provided in the bottom corners of each box and a louver will be provided on each side near the top of the box, below the latches.

LIGHTS FOR TURNTABLE WALKWAY

There will be white LED lights provided at the aerial turntable. The lights will be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights will be activated by the aerial master switch.

TURNTABLE CONSOLE LIGHTING

There will be one (1), TecNiq Model T10, white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights will be activated by the aerial master switch.

TURNTABLE LIGHTING GUARD

The lights on the turntable will have guards provided to protect them from damage.

BASKET HEAT SHIELDS

A heat reflective shield will be provided on the front, sides and bottom of the basket.

The double pan basket access doors will form the heat shield at the front of the basket. The area between the access doors and behind the monitor(s) will be shielded with a horizontally hinged single pan aluminum fold down panel. The side heat shields will be formed by a single sheet of .090" aluminum. These heat shields will be painted to match the aerial basket.

Full under the basket heat shield protection with a non-glare finish will be provided with dual swing-down doors for ease of servicing and clean out.

INFORMATION CENTER

There will be an information center provided. The information center will operate in temperatures from -40 to 185 degrees Fahrenheit. The information center will employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD will have a minimum 400nits rated, color display. The LCD will be sunlight readable. The LCD display will be encased in an ABS, black plastic housing with a gray decal. There will be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

Operation

The information center will be designed for easy operation in everyday use. There will be a page button to cycle from one screen to the next screen in a rotating fashion. A video button will allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center will return to the vehicle information screens. There will be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels will be specific to the information being viewed.

General Screen Design

Where possible, background colors will be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color will be used. If the information provided on a screen is not within acceptable limits, an amber background color will indicate a caution condition and a red background color will indicate a warning condition.

Every screen in the information center will include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time will be synchronized between all Command Zone color displays located on the vehicle. The Alert Center will display text messages for audible alarms. The text messages will identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm will cycle every second until the problems have been resolved. The background for the Alert Center will change to indicate the severity of the warning message. Amber will indicate a caution condition and red will indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color will be shown for all Alert Center messages.

A label will be provided for each button. The label will indicate the function for each active button for each screen. If the button is not utilized on specific screens, it will have a button label with no text.

Symbols will accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

Page Screens

The Information center will include the following pages:

The Aerial Main and Load Chart page will indicate the following information:

Rungs Aligned and Rungs Not Aligned will be indicated with text and respective green or red colored ladder symbols

Ladder Elevation will be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder

Water Flow (if applicable) will be indicated via a water nozzle symbol and text indicating flow / time

Breathing Air Levels will be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle will indicate oxygen levels above 20%. A red bar graph will indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph will flash.

The Aerial Load Chart will indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable).

At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Aerial Reach and Hydraulic Systems page will indicate the following information:

Aerial Hydraulic Oil Temperature will be indicated with symbol and text. At a glance features will be utilized.

Aerial Hydraulic Oil Pressure will be indicated with a symbol and text. At a glance features will be utilized.

The following calculations will be indicated on a representative vehicle symbol:

Aerial Device Extension length.

Aerial Device Height indicating the height of the aerial device tip from the ground.

Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable.

Aerial Device Angle indicating the angle from the vehicle which the device is at.

At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

The Level Vehicle page will indicate the following information:

The grade of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol will tilt dependent on the vehicle grade.

The slope of the vehicle will be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol will tilt dependent on the vehicle slope.

Outriggers status will be indicated via a colored symbol for each outrigger present. Each outrigger status will be defined as one of the following:

Outrigger stowed indicated with a silver pan located close to the vehicle

Outrigger fully extended indicated with a fully deployed green outrigger

Outrigger short-jacked indicated by a yellow outrigger partially deployed

Outrigger not set indicated by a red outrigger that is not set on the ground

A text box located on the vehicle symbol will be utilized to identify the overall status of the outrigger leveling system. The following status will be indicated in the text box:

Deployed status will indicate all outriggers are properly set on the ground at full extension

Shortjacked status will indicate one or more outriggers are set on the ground but not fully extended.

Not Set status will indicate one or more outriggers is not properly set on the ground.

Stowed status will indicate all outriggers are stowed for vehicle travel.

A bedding assist alert will indicate that the aerial device is being aligned by the Command Zone system as the operator lowers the aerial device into the cradle with the joystick.

At A Glance color features will be utilized on this screen. Caution type conditions will be indicated via a yellow background. Warning type conditions will be indicated via a red background. Conditions operating within acceptable limits will be indicated via a green background.

Menu Screens

The following screens will be available through the Menu button:

The View System Information screen will display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

The Set Display Brightness screen will allow brightness increase and decrease and include a default setting button.

The Configure Video Mode screen will allow setting of video contrast, video color and video tint.

The Set Startup screen allows setting of the screen that will be active at vehicle power-up.

The Set Date and Time screen has a 12- or 24-hour format, and allows setting of the time and date.

The View Active Alarms screen shows a list of all active alarms including the date and time of each alarm occurrence and shows all alarms that are silenced.

The System Diagnostics screen allows the user to view system status for each module and its respective inputs and outputs. Viewable data will include the module type and ID number; the module version; and module diagnostics information including input or output number, the circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

Aerial Calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

Button functions and button labels may change with each screen.

LOWER CONTROL STATION

A lower control station will be located at the rear of the apparatus in an easily accessible area. The controls and indication labels will be illuminated for nighttime operation. The following items will be furnished at the lower control station and will be clearly identified and conveniently located for ease of operation and viewing:

- Level assist switch
- Override switch to override microprocessor
- Emergency power unit switch

AERIAL DEVICE CONTROL STATIONS

There will be two (2) device control stations, one (1) will be referred to as the basket control station and the other as the turntable control station. All elevation, extension and rotation controls will operate from both of these locations. The controls will permit the operator to regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. The controls will be grouped and operate in an identical manner at both stations for similarity of operation. The controls will be clearly marked and lighted for nighttime operation.

Each control will be equipped with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the basket controls, even if the ladder is being operated by the basket controls.

TURNTABLE CONTROL STATION

The turntable control station will be located on the left side of the turntable so the operator may easily observe the basket while operating the controls.

The following items will be installed at the turntable control station, clearly identified and lighted for nighttime operation and conveniently located for ease of operation and viewing:

- Electric controls for elevation, rotation, extension/retraction

- Intercom controls
- Tip tracking light switch
- Emergency power unit switch
- Operator's load chart
- Three (3) position switch for selecting aerial operational speed

BASKET CONTROL CONSOLE

The basket instrument panel will be located at the front center of the aerial platform. The following controls will be installed at the console and be clearly identified and illuminated for nighttime operation and conveniently located for ease of operation and viewing:

- Intercom controls
- Operator's load chart

AERIAL FUNCTION CONTROLS

The aerial function controls, elevation, rotation, extension/retraction will be mounted in a separate control box, which will be attached to the front of the platform control console by means of an easily removable slide mechanism. The aerial function control box will have infinite positions along with three (3) fixed attachment points in the basket. The electrical connection will be by a permanently attached, strain relieved, coiled cord. The legend for the control lever functions will be illuminated.

HIGH IDLE

The high idle will be controlled by the microprocessor. The microprocessor will automatically adjust the engine rpm to compensate for the amount of load placed upon the system. The system will include a safety device that allows activation of the high idle only when the parking brake is set and the transmission is placed in neutral.

STABILIZERS

Two (2) sets of extendible, out and down, "H" type stabilizers will be provided for stability. The stabilizers will have a spread of 18'.

The stabilizers will be the double box design, with jack cylinders, that have a 4.25" internal diameter (bore), 3.00" diameter cylinder rod and a 34.88" stroke. The jack cylinders will be equipped with integral holding valves, which will hold the cylinder in either the stowed position or the working position, should a charged line be severed at any point within the hydraulic system. For safety, the integral holding valves will be located in the cylinder base end, NOT in the transfer tube. Vertical jack cylinder rods will be fully enclosed by a telescoping inner box to protect the cylinder rods against damage that may occur.

The extension cylinders will be totally enclosed within the extension beams. The horizontal extension cylinders will be of the trombone type to eliminate wear and potential failure of hydraulic hoses.

The stabilizers will have the capability of 18.00" of ground penetration, for set-up on uneven terrain. Extension of the horizontal beams will be activated by an extension cylinder, which has a 2.25" internal diameter (bore), 1.38" diameter cylinder rod and a 63.25" stroke. The extension cylinders will be totally

enclosed within the extension beams. The cylinders will be equipped with internal decelerators. The cross section dimensions will be 13.00" high x 6.81" wide.

Each stabilizer leg will have attached to the end of the leg a 16 gauge pan. The pan will be of the split-pan design and will be a maximum 13.50" wide to allow the extension of the stabilizer between parked cars. This pan will serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges will be flanged back for added strength.

STABILIZER CONTROLS

A portable stabilizer control box will be provided. The control box will be weatherproof and oil resistant. Each function and indicator light will be labeled on a metal photo panel. The control box can be taken as far away as 15 feet from the vehicle with an extension cable.

The stabilizer control box will include the following:

- One (1) green power indicator light for stabilizer control that will be illuminated when the aerial master and "PTO" switches in the cab are activated.
- Four (4) electric joysticks for stabilizers: each toggle switch will control the extend/retract and raise/lower of its respective stabilizer to allow vehicle set up in restricted areas and/or on uneven surfaces.
- Leveling assist push button: The outrigger control system will incorporate a computerized self-leveling system in addition to the standard outrigger controls. The operator will have the option to manually or automatically level the truck. The computerized system will ensure full outrigger extension, proper jack penetration, and will level the vehicle within 1/2 a degree of level for safe operation of the aerial device.
- One (1) electric push button for the engaging the emergency power unit
- One (1) red "stabilizer not stowed" indicator light: this light will illuminate when the stabilizers are not in the fully stowed position.
- Four (4) fully extended beams green indicator lights: these lights will be illuminated when each of the respective stabilizer beams are fully extended.
- Four (4) firm on ground green indicator lights: each light will be illuminated when its respective stabilizer shoe is in the load supporting condition.

Each joystick will activate the engine fast idle automatically.

Manual override will be supplied for each stabilizer control valve.

A "Stabilizers Not Stowed" indicator will be provided in the driver's compartment. It will illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the apparatus if moved. The stabilizer system will also be wired to the "Do Not Move Indicator Light", which will flash whenever the apparatus parking brake is not fully engaged and the stabilizers are not fully stowed.

STABILIZER PADS

A one (1) position, floating stabilizer pad will be provided on each stabilizer. The pads will require no operator adjustment during set up. The stabilizer pad will have the ability to pivot, in a 360-degree plane, for set up on uneven terrain.

AUXILIARY STABILIZER PADS

A set of four auxiliary plates with handles will be provided for additional load distribution on soft surfaces. Their size will be 31.00" x 26.00" and they will be constructed of a lightweight composite material. The ground contact area for each stabilizer will be such that a unit pressure not greater than 75 psi (500 kPa) will be exerted over the ground contact area when the apparatus is loaded to its maximum in-service weight and the aerial device is carrying its rated capacity in every position permitted by the manufacturer. Two (2) auxiliary plates will be stored on each side of the vehicle.

CRADLE INTERLOCK SYSTEM

A cradle interlock system will be provided, to prevent the lifting of the aerial from the nested position, until the operator has positioned all the stabilizers in a load-supporting configuration. A switch will be installed at the cradle, to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

STABILIZER SCENE LIGHTS

A 4.00" diameter, clear floodlight will be mounted at each stabilizer, to illuminate the surrounding area. The light will activate with the aerial master switch.

STABILIZER PAN MATERIAL

The aerial stabilizer pans will be polished stainless steel.

STABILIZER PINS

The stabilizer jacks will have holes for the stabilizer pins.

STABILIZER CONTROL BOX ALUMINUM DOOR

A vertically hinged smooth aluminum door will be provided over the stabilizer control box. The door will be hinged outboard.

HYDRAULIC SYSTEM

All high-pressure hoses will have an abrasion resistant cover, and have a rating greater than or equal to the working pressure of the circuit in which they are installed. All hydraulic fittings will be plated to minimize corrosion. The fitting will use an O-ring face seal, where possible, to minimize hydraulic leaks. All pressure carrying hydraulic hoses will have a 4:1 safety rating based on burst pressure

An interlock will be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in NFPA standards.

The hydraulic system will be of the load sense design to minimize heat build up and provide smooth control of the aerial ladder. The system will meet the performance requirement in NFPA standards, which requires adequate cooling after less than 2 1/2 hours of operations.

All hydraulic components that are non-sealing, where failure could result in the aerial movement, will comply with NFPA standards and have burst strength of 4:1. Dynamic sealing components, where failure could cause aerial movement, will have a margin of 2:1 on maximum operating pressure per NFPA standards. All hydraulic hoses, tubes, and connections will have minimum burst strength of 3:1 per NFPA standards.

A hydraulic oil pressure gauge will be supplied at the base control location per NFPA standards.

The aerial hydraulic system will be designed in such a manner that a hydraulic pump failure or line rupture will not allow the aerial or outriggers to lose position. Hydraulic holding valves will be mounted directly into cylinders. To insure reliable performance of holding valves, no hoses or tubing will be permitted between a holding valve and cylinder. The aerial will incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks. Hydraulic power to the ladder will be transferred from the pedestal by a hydraulic swivel.

HYDRAULIC RESERVOIR

The hydraulic system will consist of an oil reservoir mounted to the torque box and plumbed to the hydraulic pump. There will be plumbing for a supply and return line and a tank drain on the reservoir.

The hydraulic pump suction line will have a shut-off ball valve for pump servicing.

The hydraulic oil reservoir fill will be labeled per NFPA standards. The hydraulic system will use multi-weight, SAE grade oil. ISO grade will be based on geographical location. The manufacturer will certify that the oil meets or exceeds the hydraulic cleanliness rating of 18/15/13 per ISO 4406:1999 before delivery.

HYDRAULIC FILTERS

The system will incorporate the following filters to provide dependable service:

- Separate magnet (not on strainer)
- Reservoir suction strainer: 125 mesh
- Pressure filter with dirt alarm: Nominal 5 micron filter with a rating of 6.5 micron @ Beta 200 (99.5% efficiency); 7.5 micron @ Beta 1000 (99.9% efficiency)
- Return filter with dirt alarm: Nominal 5 micron filter with a rating of 6.5 micron @ Beta 200 (99.5% efficiency); 7.5 micron @ Beta 1000 (99.9% efficiency)
- Desiccant breather filter: Water capacity 4 fluid oz, 5 micron rating

HYDRAULIC CYLINDERS

All hydraulic cylinders used on the aerial device will be produced by a manufacturer that specializes in the production of hydraulic cylinders.

POWER TAKEOFF / HYDRAULIC PUMP

The apparatus will be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift located inside the cab. The power takeoff, which drives the hydraulic pump, will

meet all the requirements for the aerial unit operations. The hydraulic pump will be a variable displacement piston pump, for consistent and rapid response, and be capable of supplying hydraulic oil at a nominal 50gpm flow at pressures up to 3000 psi. The system will operate up to 3000 psi with flow controls to protect hydraulic components and incorporate a relief valve set at 3150 psi to prevent over pressurization. The hydraulic pump will be solely dedicated to aerial operations. An amber indicator light will be installed on the cab instrument panel to notify the operator that the power takeoff is engaged.

An interlock will be provided that allows operation of the aerial power takeoff shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle.

EMERGENCY PUMP

The hydraulic system will be designed with an auxiliary power unit meeting the guidelines of NFPA standards. The auxiliary power unit will be a 12-volt pump connected to the chassis electrical system. The pump will provide operation at reduced speeds to store the aerial device and outriggers for road transportation.

Self-centering switches will be provided at the turntable and stabilizer control station to activate the system. The system will be designed to provide a minimum of 30 minutes of hydraulic power to operate functions.

HYDRAULIC SWIVEL

The aerial ladder will be equipped with a three (3) port, high pressure hydraulic swivel which will connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel will allow for 360 degree continuous rotation of the aerial.

ELECTRIC SWIVEL

The ladder will be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 36 collector rings will be provided that are capable of supplying 20 amp continuous service. All collector rings will be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone will be used.

12-BIT ABSOLUTE ENCODER

The aerial ladder will be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.

The 12-Bit Absolute Encoder will provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the 12-Bit Absolute Encoder will allow power to be returned to the system without having to re-zero the settings.

The 12-Bit Absolute Encoder will be an integral part of a micro-processor based control system.

ELECTRICAL SYSTEM

The 100' platform will utilize the Pierce Command Zone™ System. The system will consist of the following components:

A tethered, CAN-based, stabilizer control will be provided. The tethered control will be weatherproof and oil resistant. The stabilizer control will be illuminated with a LED strip light in the face of the unit. The electrical connection at the tethered control will be permanently attached by a strained relieved coil cord that will allow the operator to move at least 14 feet away from the electrical connection for operation.

Remote Stabilizer Controls

Brightness control

Weatherproof and oil resistant

One (1) green "power" indicator light

One (1) red "stabilizer not stowed" indicator light

One (1) electric push button for level assist

One (1) electric push button for the emergency power unit

One (1) electric joystick for each stabilizer control:

Extend/retract function

Raise/lower function

One (1) green "stabilizer fully extended" indicator light for each stabilizer

One (1) green "firm on ground" indicator light for each stabilizer

Control System Modules

Each of the control system modules will be configured as follows:

Sealed to a NEMA 4X rating

Operating range from -40 degrees F to 156 degrees F (-40 degrees C to 70 degrees C)

Communicate using J1939 data link

Two (2) diagnostic LED lights

One (1) green light that illuminates when module has power (B+) and ground

One (1) red light that flashes to indicate the module is capable of communicating via the data link

Up to 16 diagnostic LEDs on each module

Ground matrix identification system

The following control system modules will be used:

Control Module

Main controller for the system

USB connection allows for computer diagnostics

Power Module

Built-in fault sensing

Eight (8) digital outputs

Pulse width modulating (PWM) capable

10A continuous per output

Circuit protection based on actual current draw (not affected by heat)

Current Control Module

Built-in fault sensing

Three (3) analog inputs

Eight (8) digital outputs

Pulse width modulating (PWM) capable

3A continuous per output

Closed Loop System

Circuit protection based on actual current draw (not affected by heat)

Input Module

16 software selectable (digital or analog) inputs

Output Module

16 digital outputs

Input/Output Module

Eight (8) software selectable (digital or analog) inputs

Eight (8) digital outputs

AERIAL LIGHTS

There will be three (3) Whelen®, 12 volt DC LED lights provided on the aerial device below the hand rail per the following:

- One (1) Model MPB*, 4,100 lumens light installed on the driver's side base section of the aerial device with adjustable mount. The driver's side tracking light to include flood optics.
- One (1) Model P*H2P, 17,750 lumens light installed on the front of the basket with an adjustable pedestal mount. The light will be configured with flood optics.
- One (1) Model MPB*, 4,100 lumens light installed on the passenger's side base section of the aerial device with adjustable mount. The passenger's side tracking light to include flood optics.
- The tracking light(s) to include white painted parts. The tip light to include white painted parts.

Power to the lights will be controlled by a switch located at platform/tip and turntable.

STABILIZER WARNING LIGHTS

There will be four (4) Whelen®, Model M6*, LED flashing warning lights with Whelen, Model M6FC, chrome flanges installed, one (1) on each stabilizer cover panel.

- The front stabilizer pan lights will be red LED with a lens color the same as the LEDs
- The rear stabilizer pan lights will be red LED with a lens color the same as the LEDs

These warning lights will be activated by the same switch as the side warning lights.

STABILIZER BEAM WARNING LIGHTS

Two (2) 4.00" diameter red LED flashing lights will be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward. The lights will be Grote Supernova 40 series LED lights. The lights will be recessed in the horizontal beam of the stabilizer. These warning lights will be activated with the aerial master switch.

STABILIZER SCENE LIGHTS

There will be one (1) Truck-Lite, Model 44042C 4.00" LED, scene light installed under each stabilizer beam to illuminate the surrounding area. A total of four (4) lights will be installed. These lights will be activated by the aerial master switch.

PLATFORM 120-VOLT ELECTRIC SYSTEM

Two (2), 20 amp, 120-volt, three (3)-prong household receptacles with weatherproof covers will be provided in the aerial platform. One (1) receptacle will be located at the platform control console and one (1) will be located at the rear of the basket. Each receptacle will be supplied from individual branch circuits protected by dedicated 20 amp/120-volt circuit breakers. All wiring will be sized to and conform to the latest edition of NED standards.

120 VOLT PLATFORM FLOODLIGHTS

There will be two (2) Whelen, Model PFP2AP1, 120 volt AC LED floodlight(s).

There will be a Whelen, Model 86930CA1, pull up pole with light switch included with each light head.

The painted parts of this light assembly to be white.

The light(s) will be installed at the rear of the aerial platform on the driver and passenger side.

Light(s) will be switched at the lighthouse only.

The pole(s) will include a switch to be connected to the Do Not Move Truck Indicator. This indicator will be activated if the parking brake is released and the light poles are not in a stowed position.

120 VOLT UNDER PLATFORM LIGHTING

There will be two (2) Whelen, Model PFP2AC, LED 120 volt floodlight(s) installed in semi-recessed housing(s) Model PBA203, provided under the platform basket, under the driver and passenger side, facing down.

The painted parts of this light assembly to be white.

Light(s) will be switched at the platform/tip and turntable.

COMMUNICATION SYSTEM

An Atkinson communication system will be furnished between the platform and the turntable operator's position. The master control located at the turntable control console will have the transmitting and receiving volume controls along with the push to talk button. A self-contained "hands-off" speaker microphone will be located front and center of the platform which will require no operator attention to transmit or receive.

BREATHING AIR

Breathing air will be supplied to the aerial platform. The air system will incorporate one (1) 510 cubic foot, 6000-psi cylinder. To allow the turntable operator an unobstructed view of the platform the cylinder will be mounted directly in front of the turntable and below the ladders. The air cylinder will be interconnected through a pressure regulator located at the air cylinder. A shutoff valve with guard will be provided on the cylinder. The air will be routed to the basket using hose especially designed for use in breathing air systems. At the platform, the breathing air will be accessible via two (2) quick couplings for air masks. These will have a CEJN brass series 344 coupling. One (1) coupling will be located at the front of the basket on the right side and one (1) coupling will be located at the rear of the basket on the left hand side. There will be a weather resistant storage compartment for two (2) air masks provided at the basket with a rubber draw latch. A 100' recharge hose will be provided for refilling the air cylinder without having to remove the tank from its mounting.

The breathing air cylinder will be designed and constructed to conform to the requirements of the United Nations (UN) on the transportation of dangerous goods.

BREATHING AIR LEVEL AND WARNING SYSTEM

The level of breathing air remaining will be visible on the LCD display at all operating positions. The display will incorporate a low-pressure warning circuit that activates an audible alarm when 20% maximum air cylinder capacity remains. A second, louder audible alarm will activate when the remaining air level drops to 10% of maximum air cylinder capacity.

LYFECOMBO™ BRACKETS

One (1) set of brackets will be supplied which will have the following three (3) options combined into one (1) set of brackets.

LyfeLadder™ brackets will be provided for use at the front of the platform basket to increase the safety of firefighters during fireground and rescue operations. **LyfeLadder** brackets will be capable of holding up to a 20' Duo-Safety roof ladder securely in place. The roof ladder will be 19.00" wide. The ladder will be secured through its beams and one (1) rung, by a bar capable of being latched in place and able to withstand a minimum of a 500 pound load while maintaining a minimum of a two to one (2:1) safety factor. The complete system will maintain and exceed this criteria as well. There will also be a latching pawl to keep the ladder in a vertical position at all times and will latch on a rung, at least two (2) rungs below the primary attachment point. There has been appropriate strain gauging and testing completed on the system, (ladder and complete holding device), proving the above criteria has been satisfied. Additionally there is a letter on file from the roof ladder manufacturer, (Duo-Safety Corporation), stating that their standard roof ladder is approved for such an application.

LyfeEye™ rappelling arms will be provided. The **LyfeEye** brackets will mount to the front of the platform basket, one (1) each side over the monitor/s and will be held in place with four (4) hardened 1.00" hitch pins, two (2) for each bracket. The **LyfeEye** brackets will be easily removable for storage. Each **LyfeEye** rappelling arm will have a capacity of 300#.

LyfeSupport™ rescue basket support brackets will be provided. The **LyfeSupport** brackets will mount to the front of the platform basket, one (1) each side over the monitor/s and will be held in place with four (4) hardened 1.00" hitch pins, two (2) for each bracket. The **LyfeSupport** brackets will be easily removable for storage. Two (2) quick clip basket straps will be used to secure the basket to the **LyfeSupport** brackets.

AERIAL TURNTABLE MANSAYER™ BARS

ManSaver™ bars will be installed at the aerial turntable.

AERIAL WATERWAY

The aerial waterway will be capable of being supplied by either a midship mounted pump or an external water source through a 5.00" intake at the rear of the apparatus.

A 5.00" water swivel will be installed below the aerial turntable permitting the ladder to rotate 360 degrees continuously.

A 5.00" water swivel will be installed at the aerial heel pivot pin that will permit water tower operations of -5 degrees to 75 degrees. The heel pivot pin will not be integral with the waterway swivel at any point. The waterway design will allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

A telescoping aluminum waterway will be installed beneath the center of the aerial ladder. The waterway will consist of a 5.00" diameter tube for the base section, 4.50" diameter tube for the mid-section and 4.00" diameter tube for the fly section.

A 1.50" drain will be provided for the waterway with the control at the rear of the unit.

WATERWAY SEALS

The waterway seals will be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal will be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals will be internally lubricated.

The waterway seals will have automatic centering guides constructed of synthetic thermalpolymer. The guides will provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

PLATFORM WATER SYSTEM

A 4.00" (internal diameter) water swivel will connect the fly section waterway to the platform waterway. The water swivel will permit water tower operations from -5 degrees to 75 degrees. The water will be routed from the swivel to a 4.00" gear operated butterfly valve on the front of the platform using a 4.00" tube. The deluge gun will be bolted onto the butterfly valve.

A 2.50" preset pressure relief valve will be provided in the waterway system. It will be designed to protect the aerial waterway from excess pressure. It will dump water to the ground when operating.

A shower nozzle rated at 75 gpm will be provided beneath the platform for heat protection for the platform personnel. A direct linkage control for the shower nozzle will be provided.

One (1) - 2.50" preconnect will be provided at the front of the platform with a swivel elbow. The preconnect will be gated at the platform. The preconnect will be furnished with 2.50" NST threads and chrome plated cap.

AERIAL MONITORS

Two (2) Elkhart model 8294-02 double handwheel controlled monitors will be provided at the front of the aerial platform. The monitor on the driver's side of the basket will have Elkhart ST-195 stacked tips and 284A stream shaper. The monitor on the passenger's side of the basket will have Elkhart ST-195 stacked tips and 284A stream shaper

WATERWAY FLOWMETER

Waterway flow, including total water flowed, will be monitored by the microprocessor. An LCD display will be located at the upper and lower control stations.

REAR INLET

A 6.00" NST inlet with 5.00" plumbing to the aerial waterway will be provided at the driver's side rear of the apparatus. It will be furnished with a 6.00" x 5.00" chrome plated adapter, a 6.00" chrome plated, rocker lug cap and screen.

STORZ INLET ADAPTER

There shall be one (1) 6.00" FNST x 5.00" Storz 30 degree elbow(s) with blind cap with chain model CC507 provided rear waterway inlet.

MANUALS

The aerial manufacturer will provide two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device.

INITIAL INSTRUCTION

On initial delivery of the fire apparatus, the contractor will supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period of three (3) consecutive days.

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 8.9.3 will be provided by the fire department.

- Two (2) 3 ft - 4 ft plaster hooks with D handles mounted in brackets fastened to the apparatus.
- Two (2) crowbars.
- Two (2) claw tools.
- Two (2) 12 lb (5 kg) sledgehammers.
- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Six (6) salvage covers, each a minimum size of 12 ft × 18 ft (3.6 m × 5.5 m).
- Four (4) combination spanner wrenches.
- Two (2) scoop shovels.
- One (1) pair of bolt cutters, 24" (0.6 m) minimum.
- Four (4) ladder belts meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983.
- Two (2) 150 ft (45 m) utility ropes having a breaking strength of at least 5000 lb (2300 kg).
- One (1) box of tools to include the following:
 - one (1) hacksaw with three (3) blades
 - one (1) keyhole saw
 - one (1) 12" (.3 m) pipe wrench
 - one (1) 24" (.6 m) pipe wrench
 - one (1) ballpeen hammer
 - one (1) pair of tin snips
 - one (1) pair of pliers

- one (1) pair of lineman's pliers
- assorted types and sizes of screwdrivers
- assorted adjustable wrenches
- assorted combination wrenches
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- One (1) double female 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) double male 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) rubber mallet, for use on suction hose connections (if equipped with a fire pump).
- Two (2) hydrant wrenches (if equipped with a fire pump).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus (if equipped with a fire pump).
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6 (if equipped with a fire pump).
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake (if equipped with a fire pump).
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake (if equipped with a fire pump).

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires two (2) flathead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department will provide and mount the axes.

PICKHEAD AXES PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires three (3) pickhead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department will provide and mount the axes.

PAINT

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
2. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion.
3. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
4. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the

proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.

7. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.

After the cab and body are painted, the color will be verified to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications will be used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and painted separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T. standard in critical areas. These requirements must be met in order for the exterior paint finish to be considered acceptable. The manufacture's written paint standards will be available upon request.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be recycled to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

CAB PAINT

The cab will be painted #20 white.

BODY PAINT

The body will be painted to match the lower section of the cab.

GALVANIZED CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Frame liners
- Cross members
- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

AXLE HUB PAINT

All axle hubs will be painted to match primary job color.

TRANSIT COATING

All non-painted metal surfaces on the exterior of the vehicle will be sprayed with a corrosion protective coating provided by Carwell. The coating can be removed with soap and water. The coating is made of a linseed oil base and is biodegradable.

The underside non-painted metal surfaces will also be coated with a corrosion protective coating.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

AERIAL DEVICE PAINT COLOR

The aerial device paint procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point will be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.
2. Zinc Rich Primer - Zinc rich primer will be applied to the torque box and stabilizers.
3. Primer/Surfacer Coats - A two (2) component epoxy primer/surfacer will be applied to the mechanically shot-blasted metal surfaces to provide a strong corrosion protective base coat and to

smooth out the surface. All seams will be caulked with a two (2) component epoxy caulk before painting.

4. Hand Sanding - The primer/surfacers coat of the outer surfaces of the hand rails and base rails will be lightly sanded to a smooth finish.
5. Primer Coat - A two (2) component epoxy primer coat will be applied over the sanded primer.
6. Topcoat Paint - Urethane base coat will be applied to opacity for correct color matching.
7. Clear Coat - Two (2) coats of an automotive grade two (2) component urethane will be applied.

Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. will be supplied as received from the vendor.

Removable items such as brackets will be removed and painted separately to ensure paint coverage behind all mounted items.

The aerial device components will be painted as follows using the aforementioned seven (7) step finishing process:

- Aerial basket and basket leveling cylinders at tip: blue white 20
- Aerial device ladder sections and extension cylinders: blue white 20
- Aerial turntable and leveling cylinders (if applicable) at turntable: blue white 20
- Aerial control console: blue white 20
- Aerial lift cylinders: blue white 20
- Aerial rotation motor (if applicable): blue white 20
- Aerial torque box, support structure and components below the rotation point: gloss black primer
- Aerial stabilizers (middle and rear only): black 101
- Aerial boom support: gloss black primer

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the rear wall and aluminum doors. Rear compartment doors, stainless steel access doors, and the rear bumper will not be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

REFLECTIVE STRIPE ON STABILIZERS

There will be a 4.00" wide yellow reflective stripe provided on the forward and rear facing side of all aerial stabilizers.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

OUTLINE, REFLECTIVE STRIPE

A Black outline will be applied on the top and the bottom of the reflective band. There will be one (1) set of outline stripes required.

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 3.00" high, with outline will be provided.

LETTERING

Twenty-one (21) to forty (40) reflective lettering, 10.00" high, with outline will be provided.

LETTERING, SCRIPT

Script lettering will be provided on the rear body compartment door. The lettering will state "Everyone Comes Home".

EMBLEMS

There will be four (4) monogram emblem(s) installed one on each side on the cab doors and one each side on the platform basket , with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of gold reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be a pair of American flag emblems, installed in the window over the rear cab doors. The emblem will be waving and made out of Gerber Vision material.

EMBLEM

There will be one (1) emblem(s), approximately 24.00" - 25.00" wide in size, installed R1. The emblem will feature a "Flying American Flag" and an "Eagle Head".

INTERCOM SYSTEM (shipped loose)

- Four (4) Remote Headset Station Model U3802
- One (1) Master Station Model U3800
- Two (2) Remote Interface Module PTT Model U3811
- Five (5) Headset Behind-The -Head Model H3342
- 25 Feet of 6 Conductor Wire
- 25 Feet of 4 Conductor Wire
- One (1) Power Cord (For U3800) Model C3820
- Five (5) Remote Jumper Cord 12Ft Model C38-12
- Two (2) Remote Jumper Cord 25Ft Model C38-25
- Six (6) Connector Kit 6 pin
- Two (2) Connector Kit 4 pin
- One (1) Radio Interface Cord C3821

OVAL STRAPPING HERON RIB

two (2) roll (s) shall be provided and shipped loose with the truck for the department to install. The color will be red.

one (1) Akron Trimeese (3) 2.5"(F)NST X 6"(F)NST will be provided.

FLUID ANALYSIS

Fluid sample analysis of the engine oil, the transmission fluid, and the cooling system will be provided. Written results of these tests will be provided to DFD Fleet Management.

MANUALS CHASSIS ENGINE

Engine trouble shoot and parts manuals will be provided.

MANUALS, CHASSIS TRANSMISSION

Transmission service and parts manuals will be provided.

CHASSIS SERVICE

Chassis service will be done when the apparatus arrives at the dealer location, but before delivery to the customer.

Service will include:

- Engine Oil and filter change
- Fuel filter change
- Grease drivelines
- Check and fill all fluids.

INSPECTION TRIP #3

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a delivery inspection. .

INSPECTION TRIP #1

An inspection trip will be provided for two (2) people. Trip will take place at customer location for a preconstruction conference. .

INSPECTION TRIP #2

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a post paint inspection. .

MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

The manual will contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate a part

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this document.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0284, is included with this document.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this document.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this document.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this document.

TDM REAR AXLE FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor™ Axle 5 year limited warranty will be provided.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system.

COMPARTMENT LIGHT WARRANTY

The compartment lights will not offer an extended warranty.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this document.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

An AMDOR roll-up door limited warranty will be provided. The roll-up door will be warranted against manufacturing defects for a period of **ten (10) years**. A **five (5) year** limited warranty will be provided on painted roll up doors.

The limited warranty certificate, WA0185, is included with this document.

TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY

The Pierce device limited warranty certificate, WA0052, is included with this document.

AERIAL SWIVEL WARRANTY

An Amity five (5) year limited swivel warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

AERIAL WATERWAY WARRANTY

An Amity ten (10) year limited waterway warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FOUR (4) YEAR PRO-RATED PAINT AND CORROSION

A Pierce aerial device limited pro-rated paint warranty certificate, WA0047, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

TWO (2) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY

A Harrison Hydra-Gen generator two (2) year limited warranty will be provided.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this document.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this document.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab integrity certification with this document. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush

The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

PERFORMANCE CERTIFICATIONS

Cab Air Conditioning

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

Cab Defroster

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

Cab Auxiliary Heater

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in

SAE J381. The bidder will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).



FRONT RANGE FIRE APPARATUS

**7600 Miller Court
Frederick, CO 80504
303-449-9911
1-800-334-9911
www.FrontRangeFire.com**

**DUANE DOUCETTE
303-304-6118
DuaneD@frontrangefire.com**



PERFORM. LIKE NO OTHER.™

FOR FURNISHING FIRE APPARATUSNovember 14, 2021City and County of Denver

The undersigned is prepared to manufacture for you, upon an order being placed by you, for final acceptance by Front Range Fire Apparatus., at its home office in Frederick, Colorado, the apparatus and equipment herein named and for the following prices:

(2) Pierce Velocity Pumpers per attached component list **\$1,420,265.00**
HGAC FS12-19
Delivery is approximately 16.5 to 18.5 months

Option 1: Make Chassis Pre-Payment of \$821,647.00
Due in Net 30 Days of Signed Contract **Deduct (\$24,649.00)**

Option 2: Make 100% Prepayment of \$1,377,765.00
Due in Net 30 Days of Signed Contract **Deduct (\$42,500.00)**

Additional discount if ordered on or before 01/31/2022 **Deduct (\$87,780.00)**

Total \$ _____

Said apparatus and equipment are to be built and shipped in accordance with the specifications hereto attached, delays due to strikes, war, or intentional conflict, failures to obtain chassis, materials, or other causes beyond our control not preventing, within about 16.5 to 18.5 months after receipt of this order and the acceptance thereof at our office at Frederick, Colorado, and to be delivered to you Denver, CO

The specifications herein contained shall form a part of the final contract, and are subject to changes desired by the purchaser, provided such alterations are interlined prior to the acceptance by the company of the order to purchase, and provided such alterations do not materially affect the cost of the construction of the apparatus.

The specification for fire apparatus conforms with all Federal Department of Transportation (DOT) rules and regulations in effect at the time of bid, and with all National Fire Protection Association (NFPA) Guidelines for Automotive Fire Apparatus as published at the time of bid, except as modified by customer specifications. Any increased costs incurred by first party because of future changes in or additions to said DOT or NFPA standards will be passed along to the customers as an addition to the price set forth above.

Unless accepted within 30 days from date, the right is reserved to withdraw this proposition.

FRONT RANGE FIRE APPRATUS.

By: _____
 Duane Doucette
 SALES REPRESENTATIVE





Option List

11/14/2021

Customer:	Denver Fire Department	Bid Number:	1011
Representative	Doucette, Duane	Job Number:	
Organization:	Front Range Fire Apparatus, Ltd	Number of Units:	2
Requirements Manager:		Bid Date:	11/08/2021
Description:	Pumper, Velocity 2021	Stock Number:	
Body:	Pumper, Short, Aluminum, 2nd Gen	Price Level:	40 (Current: 40)
Chassis:	Velocity Chassis (Med Block), 2010	Lane:	

Line	Option	Type	Option Description	Qty
1	0766611		Boiler Plates, Pumper Fire Department/Customer - Denver Fire Department Operating/In conjunction W-Service Center - Operating Miles - 25 Miles Number of Fire Dept/Municipalities - 25 Bidder/Sales Organization - Front Range Fire Apparatus Delivery - Delivery representative Dealership/Sales Organization, Service - Front Range Fire Apparatus	1
2	0661794		Single Source Compliance	1
3	0584456		Manufacture Location, Appleton, Wisconsin	1
4	0584452		RFP Location: Appleton, Wisconsin	1
5	0588609		Vehicle Destination, US	1
6	0670275		Unit to be Similar in some Aspects, Excluding Pump Panel Fill in Blank - previous truck 35304	1
7	0788859	SP	Fast Track Template Truck Fill in Blank - Options: 24 SP's - 480 Total	1
8	0610784		Comply NFPA 1901 Changes Effective Jan 1, 2016, With Exceptions	1
9	0533347		Pumper/Pumper with Aerial Device Fire Apparatus	1
10	0588611		Vehicle Certification, Pumper	1
11	0661778		Agency, Apparatus Certification, Pumper/Tanker, U.L.	1
12	0799172		FLEET CUSTOMER	1
13	0620362		Consortium, HGAC	1
14	0537375		Unit of Measure, US Gallons	1
15	0030006		Bid Bond Not Requested	1
16	0582800		Performance Bond, 100% with 25% Warranty Bond, 1 Yr, and Payment Bond	1
17	0000007		Approval Drawing	1
18	0611571	SP	Drawing, As Built, At Delivery a Revised Print w/ Changes, FLEET	1
19	0002928		Electrical Diagrams	1
20	0597598		Velocity Chassis (Med Block), 2010	1
21	0021009		Overall Length, Target Size - approximately 31' .25"	1
22	0000110		Wheelbase Wheelbase - 175.50"	1
23	0000070		GVW Rating GVW rating - 42,000 pounds	1
24	0000203		Frame Rails, 13.38 x 3.50 x .375, Qtm/AXT/Imp/Vel/DCF	1
25	0020018		Frame Liner Not Req'd	1
26	0508847		Axle, Front, Oshkosh TAK-4, Non Drive, 18,000 lb, Imp/Vel	1
27	0091744		Suspension, Front TAK-4, 18,000 lb, Qtm/AXT/Imp/Vel/DCF	1
28	0087572		Shock Absorbers, KONI, TAK-4, Qtm/AXT/Imp/Vel/DCF/Enf	1
29	0000322		Oil Seals, Front Axle	1
30	0582936		Tires, Front, Goodyear, G289 WHA, 315/80R22.50, 20 ply	1
31	0019575		Wheels, Front, Alcoa, 22.50" x 9.00", Aluminum, Hub Pilot	1
32	0000310		Request for Turning Radius Report	1
33	0530463		Axle, Rear, Meritor RS23-186, 24,000 lb Imp/Vel/Dash CF	1
34	0544253		Top Speed of Vehicle, 68 MPH	1
35	0040557		Suspen, Rear, Reyco, Spring, 27,000 lb, w/24,000 lb Axle	1
36	0000485		Oil Seals, Rear Axle	1
37	0587216		Tires, Rear, Goodyear, G622 RSD, 12R22.50, 16 ply, Single	1
38	0019625		Wheels, Rear, Alcoa, 22.50" x 8.25", Aluminum, Hub Pilot, Single	1
39	0642999		Tire Balancing, Not Required	1

Line	Option	Type	Option Description	Qty
40	0627984		Tire Pressure Monitoring, RealWheels, AirSecure, Valve Cap, Front Tires Only	1
			Qty, Tire Pressure Ind - 2	
41	0003245		Axle Hub Covers w/center hole, S/S, Front Axle	1
42	0097571		Mud Flap, Mounted even with Fenderetts	1
			Location - front	
			Qty, - 1	
43	0002045		Mud Flap, Front and Rear, Pierce Logo	1
44	0640104	SP	Label, Informational, Crossfire System, 85 PSI	1
45	0011930		Tire, "Crossfire" Air Pressure Equalization	1
46	0031931		Valve, Extension Stabilizer System, Rear Duals	1
47	0753180	SP	Chains, Rud automatic tire, 18 strand, Eng Approval	1
48	0544802		Chocks, Wheel, SAC-44-E, Folding	1
			Qty, Pair - 01	
49	0544806		Mounting Brackets, Chocks, SAC-44-E, Folding, Horizontal	1
			Qty, Pair - 01	
			Location, Wheel Chocks - Left Side Rear Tire, Forward	
50	0593760		ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010	1
51	0030185		Brakes, Knorr/Bendix 17", Disc, Front, TAK-4	1
52	0000730		Brakes, Meritor, Cam, Rear, 16.50 x 7.00"	1
53	0020784		Air Compressor, Brake, Cummins/Wabco 18.7 CFM	1
54	0000785		Brake Reservoirs, Three	1
55	0587033		Air Dryer, Brake, AD-9 w/heat, 2010	1
56	0000790		Brake Lines, Nylon	1
57	0000854		Air Inlet, w/Disconnect Coupling	1
			Location, Air Coupling(s) - a) DS Step Well, Rearward	
			Qty, Air Coupling (s) - 1	
58	0000860		Outlet, Air, with shut off valve	1
			Location, Air Coupling(s) - o) DS Frt Body Compt	
			Qty, Air Coupling (s) - 1	
59	0004200		Hose, Air 25' length, w/air chuck	2
			Qty, - 02	
60	0756362	SP	Air Tank, Additional for Extra Air Horn Capacity, Location	1
			Location - under the DS running board per 33960	
61	0522855		Aux Braking Systems, Simultaneous Operation	1
62	0739892	SP	Air Dryer, Brake, Clocking	1
63	0615609		Fittings, Compression Type, Entire Apparatus, Single Rear Axle	1
64	0602848	SP	Air Line, S/S Braid, Air Governor	1
65	0736465		Engine, Cummins L9, 370 hp, 1250 lb-ft, W/OBD, EPA 2021, Imp/Vel	1
66	0001244		High Idle w/Electronic Engine, Custom	1
67	0678027		Engine Brake, Jacobs Compression Brake, Cummins Engine, with Allison Retarder	1
			Switch, Engine Brake - a) Series 60	
68	0607623	SP	Clutch, Fan, Air Actuated, Horton Drive Master, Compression Fitting	1
69	0769181	SP	Fuel/Water Separator, Special Location, Left Side Pump House	1
70	0123135		Air Intake, w/Ember separator, Imp/Vel	1
71	0794761		Exhaust System, 4", 2017 L9 Engine, Horizontal, Right Side	1
72	0775589	SP	Exhaust, Modified 20 Degree - Approval Req'd	1
73	0787999		Radiator, Impel/Velocity	1
74	0720998	SP	Cooling Hoses, Gates Silicone and Rubber Combo, Include .25" Surge Tank	1
75	0659434	SP	Modification, Rubber Hose at Radiator, Denver	1
76	0673756		Winter Cover With Ventilation, Front Cab Grille, One Piece, Vel	1
			Color, Vinyl Cover - d) White	
77	0001125		Fuel Tank, 65 Gallon, Left Side Fill	1
78	0001129		Lines, Fuel	1
79	0595087		DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	1
			Door, Material & Finish, DEF Tank - Polished Stainless	
80	0723716		Fuel Priming Pump, Electronic, Automatic, Cummins, No Swt Req'd	1
81	0582243		Shutoff Valves, Fuel Line @ Primary Filter, Cummins	1
82	0699437		Cooler, Chassis Fuel, Not Req'd.	1
83	0642576		Trans, Allison 5th Gen, 3000 EVS PR, Imp/Vel/Dash CF	1
			Trans. retarder capacity - a. low/1000, 3000 EVS	
			Trans, retarder control - l) Auto 1/3, 2/3, 3/3	

Line	Option	Type	Option Description	Qty
84	0640825	SP	Transmission, Shifter, 6-Spd, Push Button w/4+2 mode, ISL9, Short Body, Denver Trans, ratio - 3000 EVS, 6Spd	1
85	0797408		Transmission Oil Cooler, Modine, External, w/Modine External Sump	1
86	0539711		Label, TRANSynd Transmission Fluid Only	1
87	0522824		Mode, Downshift, Aggressive downshift to 3rd, w/engine brake, 6 speed	1
88	0683847		Fluid, 3000 Series Transmission, TES-295 TranSynd synthetic, IPOS, Custom	1
89	0001370		Driveline, Spicer 1710	1
90	0669988		Steering, Sheppard M110 w/Tilt, TAK-4, Eaton Pump, w/Cooler	1
91	0001544		Not Required, Steering Assist Cylinder on Front Axle	1
92	0509230		Steering Wheel, 4 Spoke without Controls	1
93	0690274		Logo/Emblem, on Dash Text, Row (1) One - Denver Text, Row (2) Two - Fire Text, Row (3) Three - Department	1
94	0680598		Credit, Drum Pump Kit, Grease, Vogel Lube System	1
95	0034671		Lube System, Vogel, 22 Point, w/TAK-4 Suspension	1
96	0723702	SP	Location - in the right rear pump house area Bracket, Accumulator Hose, Chassis Air System Location - Best Location for holding the Accumulator Blow Out Hose, See Picture in E-Folder Stage 7	1
97	0123625		Bumper, 19" Extended, Imp/Vel	1
98	0616492		Tray, Hose, Center, 19" Bumper, Outside Air Horns, Imp/Vel Grating, Bumper extension - Grating, Rubber Capacity, Bumper Tray - 09) 150' of 1.50"	1
99	0626469		Cover, Aluminum Treadplate, Two (2) Flush Lift and Turn, Hose Tray, Notched Stay arm, Tray Cover - b) Pneumatic Stay Arm	1
100	0510226		Lift & Tow Package, Imp/Vel, AXT, Dash CF	1
101	0002270		Tow Hooks, Chrome	1
102	0668315		Cab, Velocity FR, 7010 Raised Roof	1
103	0724237		Engine Tunnel, ISL, Mech Fasteners, Impel/Velocity FR	1
104	0677478		Rear Wall, Exterior, Cab, Aluminum Treadplate	1
105	0122466		Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel	1
106	0123176		Grille, Bright Finished, Front of Cab, Impel/Velocit	1
107	0002224		Scuffplates, S/S At Cab Door Jambs, 4-Door Cab Material Trim/Scuffplate - c) S/S, Polished	1
108	0527032		Trim, S/S Band, Across Cab Face, Rect Lights, Velocity Material Trim/Scuffplate - b) S/S, Brushed Turnsignal Covers - No Covers	1
109	0087357		Molding, Chrome on Side of Cab	1
110	0559130		Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven Finish, Arm Cover - Chrome Finish, Mirror Head - Chrome	1
111	0667937		Door, Full Height, Velocity FR 4-Door Cab, Raised Roof Key Model, Cab Doors - 1041 Cab, Exterior Door Handle, Finish - 4-Door, Chrome/Black	1
112	0655511		Door Panel, Brushed Stainless Steel, Impel/Velocit	1
113	0667905		Storage Pockets w/ Elastic Cover, Recessed, Overhead, Impel/Velocit FR	1
114	0667902		Controls, Electric Windows, All Cab Doors, Impel/Velocit FR	1
115	0555485		Steps, 4-Door Full Tilt Cab, Imp/Vel	1
116	0770194		Handrail, Exterior, Knurled, Alum, 4-Door Cab	1
117	0552559		Steps, Stirrup, Formed, Cab & Crew Cab Doors, Imp/Vel Light, Step, Additional - P25 LED	1
118	0509649		Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 1Lt Per Step	1
119	0002140		Fenders, S/S on Cab	1
120	0122479		Window, Side of C/C, Fixed, Velocity	1
121	0552935		Trim, Cab Side Windows, Velocity	1
122	0667980		Windows, (2), Front of Crew Cab, 10" Raised Roof, Impel/Velocit FR	1
123	0509287		Windows, Rear CC, (2) 11.25" x 18", Velocity	1
124	0553196		Trim, Cab Rear Windows, Velocity	1
125	0603101	SP	Cover, Wires, Power Point, Underneath Cab Location - over the power point wires, under the cab, inside the engine tunnel, passenger side rear for protection.	1

Line	Option	Type	Option Description	Qty
126	0748671		Cab Interior, Vinyl, Velocity FR, CARE	1
			Color, Cab Interior Vinyl/Fabric - Endure Vinyl - Silver/Gray	
127	0667943		Cab Interior, Paint Color, Impel/Velocity FR	1
			Color, Cab Interior Paint - a) gray	
128	0509532		Floor, Rubber Padded Cab & Crew Cab, Imp/Vel, Dash CF	1
129	0741239		HVAC, Impel/Velocity FR, CARE	1
			Paint Color, A/C Condenser - Painted to Match Cab Roof	
			HVAC System, Filter Access - Tool Free Panel	
			Auxiliary Cab Heater - Both	
130	0639675		Sun Visor, Smoked Lexan, AXT, Imp/Vel, Saber FR/Enforcer	1
			Sun Visor Retention - No Retention	
131	0548173		Grab Handles, Driver and Passenger Door Post, Imp/Vel	1
132	0002526		Light, Engine Compt, All Custom Chassis	1
133	0122516		Fluid Check Access, Imp/Vel	1
134	0583042		Side Roll and Frontal Impact Protection	1
135	0699999		Not Required, Frontal Impact Protection, 2010	1
136	0699998		Not Required, Side Roll Protection Package, 2010	1
137	0622617		Seating Capacity, 6 Seats	1
138	0697005		Seat, Driver, Pierce PS6, Premium, Air Ride, High Back, Safety	1
139	0696994		Seat, Officer, Pierce PS6, Premium, Air Ride, SCBA, Safety	1
140	0656795		Radio Compartment, Behind Officer Air Ride SCBA Seat, Imp/Vel	1
141	0122183		Seat, Rear Facing C/C, DS Outboard, Pierce PS6, Premium, SCBA, Safety	1
142	0102783		Not Required, Seat, Rr Facing C/C, Center	1
143	0122186		Seat, Rear Facing C/C, PS Outboard, Pierce PS6, Premium, SCBA, Safety	1
144	0108189		Not Required, Seat, Forward Facing C/C, DS Outboard	1
145	0122744		Seat, Forward Facing C/C, Center, (2) Pierce PS6, Premium, SCBA, Safety	1
146	0108190		Not Required, Seat, Forward Facing C/C, PS Outboard	1
147	0566653		Upholstery, Seats In Cab, Turnout Tuff	1
			Color, Cab Interior Vinyl/Fabric - m) Gray	
148	0543991		Bracket, Air Bottle, Hands-Free II, Cab Seats	5
			Qty, - 05	
149	0603867		Seat Belt, ReadyReach	1
			Seat Belt Color - Red	
150	0604863		Seat Belt Height Adjustment, 6 Seats, Imp/Vel, Dash CF	1
151	0627014		Pick Not Required, Seat Belt Color Selected in Seat Belt Option 627339	1
152	0602464		Helmet Storage, Provided by Fire Department, NFPA 2016	1
153	0647638		Lights, Dome, Weldon Dual LED 4 Lts	1
			Color, Dome Lt - Red & White	
			Color, Dome Lt Bzl - Grey	
			Control, Dome Lt White - Door Switches and Lens Switch	
			Control, Dome Lt Color - Lens Switch	
154	0631779		Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk EX	1
			12vdc power from - Battery switched	
155	0893590		Spotlight, Golight Stryker, Model 30**4ST, LED, 2 Lts	1
			Location - one each side	
			Color, GoLt - White	
			Bracket, Spotlight - Pedestal - 2 Lts	
156	0893537		Controller, Spotlight, Golight Stryker ST, Wired Dash Mount, 2 Lts	1
157	0621826		Location, Spotlight Controller, Driver Overhead and Officer Overhead, 2 Lts	1
158	0000000	STF	Handlights, (2) Streamlight, Fire Vulcan, 44451 C4 LED, Tail lights, 12v, Orange	1
			Location, Lights - shipped loose	
159	0568369		Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010, Dash CF	1
160	0509511		Air Restriction Indicator, Imp/Vel, AXT, Dash CF, Enf MUX	1
161	0543751		Light, Do Not Move Apparatus	1
			Alarm, Do Not Move Truck - No Alarm	
162	0509042		Messages, Open Dr/DNMT, Color Dsply,	1
163	0611681		Switching, Cab, Membrane, Impel/Velocity/Quantum, Dash CF, AXT WiFi MUX	1
			Location, Emerg Sw Pnls - Driver's Side Overhead	
164	0555915		Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	1
165	0548006		Wiring, Spare, 15 A 12V DC 2nd	1
			Qty, - 01	
			12vdc power from - Battery direct	

Line	Option	Type	Option Description	Qty
165			Wire termination - 15 amp power point plug Location - on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo.	
166	0548004		Wiring, Spare, 15 A 12V DC 1st Qty, - 04 12vdc power from - Battery direct Wire termination - Butt Splice Location, Spare Wiring - two in the front of the cab behind panel #9 two in the rear, tucked into the forward facing seat riser	4
167	0548009		Wiring, Spare, 20 A 12V DC 1st Qty, - 01 12vdc power from - Battery direct Wire termination - Stud Location, Spare Wiring - officer overhead console	1
168	0566101		Recess, Dash Panel, Officer Side, Vel/Imp	1
169	0615386		Vehicle Information Center, 7" Color Display, Touchscreen, MUX	1
170	0734857		System Of Measurement - US Customary Collision Mitigation, HAAS Alert (R2V), HA5	1
171	0606247		Subscription, HAAS R2V - R2V - 5 Year Data Plan Subscription	1
172	0660489		Vehicle Data Recorder w/CZ Display Seat Belt Monitor Antenna Mount, Custom Chassis, Fill in Blank Mounting and Cable Locations Location - just to the rear of officer seat Qty, - 01 Location 1 - front passenger side corner of the raised roof	1
173	0653526		Camera, Pierce, Driver Mux, Rear Camera Only	1
174	0615100		Camera System Audio - Not Provided Pierce Command Zone, Advanced Electronics & Control System, Diag LEDs, Vel, WiFi	1
175	0730603		Electrical System, Velocity ESP, Cummins, Paccar	1
176	0079166		Batteries, (4) Exide Grp 31, 950 CCA ea, Threaded Stud	1
177	0008621		Battery System, Single Start, All Custom Chassis	1
178	0123174		Battery Compartment, Imp/Vel	1
179	0579436		Charger, Sngl Sys, Kussmaul, 1200, 091-187-12-Remote, 40 Amp Bar Display	1
180	0012782		Location, Charger, Front Left Side Body Compartment Location, Battery Chrgr/Cmpr - High On Back Wall	1
181	0531403		Location, Bat Chrg Ind, Driver's Seat with Bracket	1
182	0016856		Shoreline, 15A 120V, Kussmaul Auto Eject, 091-55-15-120, Super Qty, - 01 Color, Kussmaul Cover - d) yellow Connection, Shoreline - the battery charger and the 6 place outlet in the crew cab	1
183	0026800		Shoreline Location Location, Shoreline(s) - DS Rear bulkhead	1
184	0529667		Cover, Protection Battery Box IO Modules	1
185	0625793		Alternator, 350 amp, Leece-Neville BLP4004H	1
186	0769064	SP	Wire Cover, Inside Pump House	1
187	0695819		Sealer (Gorp), No Gorp Req'd on Elect Connections Except Fuel Sender	1
188	0603291	SP	Open Weather Pack Connections Plugged W/Weather Pack Connectors	1
189	0092582		Load Manager/Sequencer, MUX Enable/Disable Hi-Idle - e)High Idle enable	1
190	0648716		Headlights, Rectangular Halogen, Imp/Vel	1
191	0648425		Light, Directional, Wln 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF Color, Lens, LED's - m)match LED's	1
192	0648256		Light, Directional, Wln M6T* LED Arrow, Recessed, Angle Bracket, Back of Cab Color, Lens, LED's - Match	1
193	0768311		Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt LED 2lts	1
194	0648074		Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	1
195	0090155		Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	1
196	0551870		Lights, Tail, Wln M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir w/Flange Color, Lens - Colored	1
197	0551875		Lights, Backup, Wln M6BUW, LED	1

Line	Option	Type	Option Description	Qty
198	0664466		Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp Under Tailbrd Location - driver side	1
199	0589905		Alarm, Back-up Warning, PRECO 1040	1
200	0763690		Indicator, Back-up Warning, Ultrasonic 4-zone Location - next to driver	1
201	0728314	SP	Lights, Perimeter Cab, Truck-Lite 44310C LED, Spcl Location	1
202	0617874		Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	1
203	0695719		Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step Control, Perimeter Lts - DS Switch Panel	1
204	0556360		Lights, Step, P25 LED 4lts, Pump Pnl Sw	1
205	0619047	SP	Rear Bulkhead Cup Switch, Stainless Steel Location, Lights - rear body bulkhead passenger side same as job #35304	1
206	0771420	SP	Light, Visor, Wln, 12V PSL2* Pioneer LED Spotlit, No Bracket, Denver Qty, - 01 Location, driver's/passenger's/center - Centered Switch, Lt Control 1 DC,1 - a) DS Switch Panel Switch, Lt Control 2 DC,2 - g) PS Switch Panel Switch, Lt Control 3 DC,3 - d) No Control Switch, Lt Control 4 DC,4 - d) No Control Color, Wln Lt Housing - White Paint Light, Visor, Flash - Steady Burning	1
207	0774309		Lights, Wln, P*H2* Pioneer, 12 VDC, 1st Location - back of cab driver side Qty, - 01 Color, Wln Lt Housing - White Paint Control, Scene Lts - Pump Panel Sw LS Scene Light Optics - combination	1
208	0774308		Lights, Wln, P*H2* Pioneer, 12 VDC, 2nd Mount, Wln II - Push Up Sd Mnt 20" Handle Holder & Sensor Location - back of cab passenger side Qty, - 01 Color, Wln Lt Housing - White Paint Control, Scene Lts - Pump Panel Sw LS Scene Light Optics - combination	1
209	0631374		Lights, Deck, Wln (2) MPPBCS Micro Pioneer LED Rear Flood Lights Control, Scene Lts - Sw Included on Light	1
210	0645676		Lights, Not Required, Hose Bed, Deck Lights At Rear	1
211	0645681		Lights, Not Required, Rear Work, Deck Lights At Rear	1
212	0645687		Lights, Rear Scene, Wln, M6ZC LED, 1st Qty, - 02 Control, Rear Scene Lts - Cab Switch Panel DS Location, Scene Lights - Rear Body Bulkhead, Low, 2lt	2
213	0763248		Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas Location - under the rear flange Qty, Cargo Lts - 1	1
214	0060101		Pumper, Short, Aluminum, 2nd Gen	1
215	0554271		Body Skirt Height, 20"	1
216	0028294		Tank, Water, 500 Gallon, Poly, Short	1
217	0003405		Overflow, 4.00" Water Tank, Poly	1
218	0028104		Foam Cell Required	1
219	0553729		Not Required, Restraint, Water Tank, Heavy Duty	1
220	0003429		Not Required, Direct Tank Fill	1
221	0003424		Not Required, Dump Valve	1
222	0048710		Not Required, Jet Assist	1
223	0030007		Not Required, Dump Valve Chute	1
224	0514778		Not Required, Switch, Tank Dump Master	1
225	0126633		Hose Bed, Aluminum, Pumper	1
226	0723549		Painted Hose Bed Paint Color, Hose Bed Interior - Match Lower Body	1

Line	Option	Type	Option Description	Qty
227	0003481		Hose Bed Capacity, Special Capacity, Hosebed - 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75"	1
228	0003488		Divider, Hose Bed, Unpainted Qty, Hosebed Dividers - 4	4
229	0620997	SP	Hose Restraint, Hose Bed, Vinyl, 22 oz,Top/Rr,Perm Frt,StayPut Fasteners Spacing Color, Vinyl Cover - b) yellow Vinyl flap weight - not weighted	1
230	0014473		Flap, Access to Fill Dome(s) Through Vinyl Hose Bed Cover Qty, - 02	2
231	0013512		Running Boards, 12.75" Deep	1
232	0689621		Tailboard, 16" Deep	1
233	0690037		Wall, Rear, Smooth Aluminum/Body Material Material, Rear Wall Inboard Facing Surfaces - Aluminum Diamondplate	1
234	0003531		Tow Bar, Under Tailboard	1
235	0077384		Bumper, Rear, Aluminum Treadplate, Raised	1
236	0003518		Morton Cass Insert in Running Boards	1
237	0003516		Morton Cass Insert in Tailboard	1
238	0003561		Construction, Compt, Alum, Pumper	1
239	0053650		LS 140" Rollup, Full Height Front & Rear	1
240	0053657		RS 140" Rollup, Low	1
241	0594005		Doors, Rollup, Amdor, Side Compartments Qty, Door Accessory - 05 Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	5
242	0083700		Compt, Rear, Rollup, 37.75" FF, 25.88" D	1
243	0594003		Door, Amdor, Rollup, Rear Compartment Color, Roll-up Door - AMDOR Satin Aluminum Latch, Roll-up Door - Non-Locking Liftbar	1
244	0554995		No Body Modification Required	1
245	0634455		Scuffplate, Brushed S/S, Insides of Hose Bed Walls (3)	1
246	0551416		Lights, Compt, On Scene Solutions, LED & Truck-Lite Model 79384 Location - each compartment Qty, - 06	6
247	0687146		Shelf Tracks, Painted Qty, Shelf Track - 02 Location, Shelf Track - LS1 Upper and RS1	2
248	0600350		Shelves, Adj, 500 lb Capacity, Full Width/Depth, Predefined Locations Qty, Shelf - 03 Material Finish, Shelf - Painted - Spatter Gray Location, Shelves/Trays, Predefined - RS1-Lower Third, LS1-Upper Third and LS1-Upper Third (2nd)	3
249	0726441		Partition, Trans Rear Compt Qty, Partition - 02 Location, Partition - c) both sides Material Finish, Partition - Painted - Spatter Gray	2
250	0529812		Access Panel, Compartment Wall, 1/4 Turn Fasteners Location - in the left front compartment Size - size to fit Fill in Blank - intake relief valve	1
251	0539177		Rub Rail, Aluminum Extruded, Side and Rear Body, Xtra Space (.50")	1
252	0784811		Fender Crowns, Rear, Stainless, w/Removable Liner Material Finish, Fender Liner - Painted Lower Body	1
253	0519849		Not Required, Hose, Hard Suction	1
254	0626229		Handrails, Side Pump Panels, Per Print	1
255	0588719		Handrails, Beavertail, Full Length LS, Offset RS	1
256	0014136		Handrails, Rear, (2), (1) Above and (1) Below Hose Bed Reinforcement, Hose Bed Divider - Not Required, Reinforcement	1
257	0795333		Compt, Air Bottle, Single, Fender Panel, Bolt-In Qty, Air Bottle Comp - 4 Door Finish, Fender Compt - Polished Location, Fender Compt - Single - LS Fwd, Single - LS Rear, Single - RS Fwd and Single - RS Rear	4

Line	Option	Type	Option Description	Qty
257			Latch, Air Bottle Compt - Flush Lift & Turn	
			Insert, Air Bottle Compt - Rubber Matting	
258	0045527		Horizontal Mounting Tracks for Air Bottle Holders	1
			Location, Bracket/comp. - LS2	
			Qty, - 1	
258	0000000	STF	qty, Mounting Studs - 03	1
258	0000000	STF	Ladder, 24' Duo-Safety 900A 2-Sect, Provided By FRFA	1
258	0000000	STF	Ladder, 14' Duo-Safety 775A Roof, Provided By FRFA	1
259	0004300		Brackets, Adjustable, RS	1
260	0602898		Ladder, 10' Duo-Safety Folding 585A, w/Mtg,Prov by Dealer,Pumper NFPA 2016 Class	1
			Location, Folding Ladder - Above Ladders	
261	0724570		Backboard Storage, (2), Trough, Behind Ladder Brackets	1
262	0554061		Pike Pole, 10' DUO Safety, Fiberglass, Pumper NFPA Classification	1
			Qty, Pike Poles - 1	
263	0733370		Pike Pole, 6' DUO Safety, Fiberglass	1
			Qty, Pike Poles - 1	
264	0004360		Tulip Clip Holders For Pike Poles, Pierce Furnished Pike Poles	1
			Location - over the left and right compartments - no rubber coating on clips, inboard as far as possible	
265	0004380		Steps, Folding, Front of Body, One Each Side, Eberhard	1
266	0004381		Steps, Corner, Rear of Body	1
267	0004390		Step, Folding - Extra, Body Only, Eberhard	2
			Qty, Folding Step - 02	
			Location, Additional Step - driver side front bulkhead	
268	0007575		Pump House, Side Control, 48", Control Zone	1
269	0035501		Pump House Structure, Std Height	1
270	0618626	SP	Cover, Cargo Compt, Vinyl, 22 oz, Perm Front, Velcro	1
			Color, Vinyl Cover - b) yellow	
			Qty, - 1	
271	0004425		Pump, Waterous, CSU, 1500 GPM, Single Stage	1
272	0004482		Seal, Mechanical, Waterous	1
273	0559769		Trans, Pump, Waterous C20 Series	1
274	0635600		Pumping Mode, Stationary Only	1
275	0605126		Pump Shift, Air Mnl Override, Split Shaft, Interlocked, Waterous	1
276	0003148		Transmission Lock-up, EVS	1
277	0004547		Auxiliary Cooling System	1
278	0014486		Not Required, Transfer Valve, Stage Pump	1
279	0737989		Valve, Relief Intake, Waterous	1
			Qty - 1	
			Pressure Setting - 125 psig	
280	0546803		Controller, Pressure, Class 1 Total Pressure Governor (TPG)	1
281	0673872		Primer, Trident, Air Prime, Air Operated, Automatic	1
282	0528229		Drain Locations, Special Instructions	1
283	0658368		Thermal Relief Valve, OPM, w/Red Warning Light, Waterous Pump	1
			Location, Thermal Relief Discharge - Ground	
284	0780364		Manuals, Pump, (2) Total, Electronic Copies	1
285	0602512		Plumbing, Stainless Steel and Hose, Single Stage Pump, Control Zone	1
286	0795135		Plumbing, Stainless Steel, w/Foam System	1
287	0004645		Inlets, 6.00" - 1250 GPM or Larger Pump	1
288	0014650		Pump Suction Tube(s), Short, All	1
288	0000000	STF	Valve, Ball Intake Relief, Akron Revolution, Provided By FRFA	2
			Location - right and left side	
			Qty - 2	
			Connection, Inlet, Side B - 5.0" Storz with a cap	
			Connection, Outlet, Side A - 6.0" FNST swivel long handle	
			Ball Intake Valve - 7982 (30 degree swivel inlet)	
289	0699096		Not Required, Cap, Main Pump Inlet, Included w/Storz Adapter	1
290	0024615		Valves, Full Flow Waterous Side with Akron 8000 Series Valve	3
			Qty, Valves - 3	
291	0016158		Valve, Inlet(s) Recessed, Side Cntrl, "Control Zone"	2
			Qty, Inlets - 2	
292	0004700		Control, Inlet, at Valve	1

Line	Option	Type	Option Description	Qty
293	0004660		Inlet (1), Left Side, 2.50"	1
294	0004680		Inlet, Right Side, 2.50"	1
295	0092569		No Rear Inlet (Large Dia) Requested	1
296	0064116		No Rear Inlet Actuation Required	1
297	0092696		Not Required, Cap, Rear Inlet	1
298	0009648		No Rear Intake Relief Valve Required on Rear Inlet	1
299	0092568		No Rear Auxiliary Inlet Requested	1
300	0563738		Valve, .75" Bleeder, Aux. Side Inlet, Swing Handle	1
301	0029043		Tank to Pump, (1) 3.00" Valve, 3.00" Plumbing	1
302	0004905		Outlet, Tank Fill, 1.50"	1
303	0062133		Control, Outlets, Manual, Pierce HW if applicable	1
304	0004940		Outlet, Left Side, 2.50"	1
			Qty, Discharges - 01	
305	0005091		Elbow, Left Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
306	0092570		Not Required, Outlets, Left Side Additional	1
307	0035094		Not Required, Elbow, Left Side Outlets, Additional	1
308	0004945		Outlet, Right Side, 2.50"	2
			Qty, Discharges - 02	
309	0025091		Elbow, Right Side Outlets, 45 Degree, 2.50" FNST x 2.50" MNST, VLH	1
310	0092571		Not Required, Outlets, Right Side Additional	1
311	0089584		Not Required, Elbow, Right Side Outlets, Additional	1
312	0008731		Outlet, 5" w/4" Right, Handwheel	1
			Valve, Brand - Akron	
313	0005099		Elbow, Large Dia Outlet, 30 Deg, 5.00" FNST x 5.00" Storz	1
314	0648906		Outlet, Front, 2.50" w/2.50" Plumbing	1
			Fitting, Outlet - 2.50" NST with 90 degree swivel	
			Drain, Front Outlet - Automatic	
			Location, Front, Single - top of right bumper	
315	0092575		Not Required, Outlet, Rear	1
316	0045099		Not Required, Elbow, Rear Outlets	1
317	0044930		Outlet, Rear, 2.50", Additional	2
			Location - Location will be one left and right side	
			Qty, Discharges - 02	
318	0076593		Elbow, Rear Outlets, 45 Degree, 2.50" FNST x 2.5" MNST, VLH, Additional	1
319	0620203	SP	Outlet, Front HB, 1.50" w/2.00" Plumbing, NPSH Thread	2
			Qty, Discharges - 02	
			Location, Outlet - c) one (1) each side	
320	0752097		Caps/Plugs for 1.00" to 3.00" Discharges/Inlets, Chain	1
321	0563739		Valve, 0.75" Bleeder, Discharges, Swing Handle	1
322	0039313		Adapter, Thread - 5" Storz X 2.50" MNST & Cap	1
			Qty, Adapter for Outlets - 01	
			Location, Adapter(s) - passenger side large diameter	
323	0005065		Outlet, 3.00" Deluge Riser	1
324	0029302		No Monitor Requested	1
325	0029304		No Nozzle Req'd	1
326	0005070		Deluge Mount, NPT	1
327	0723726		Speedlay Module Not Required	1
328	0722432		Hose Restraint Not Required, No Speedlay Module	1
329	0723395		Speedlays, Not Required	1
330	0723394		Speedlays, Not Required	1
331	0025140		Not Required, 1.50" Crosslays	1
332	0029199		Crosslays Sngl Sheet Unpainted, (2+) 2.50" Std Cap	2
			Qty, Crosslays - 2	
333	0591145		Hose Restraint, Crosslay/Deadlay, Top and Ends, Elastic Netting	2
			Qty, - 02	
334	0029260		Not Required, Speedlays	1
335	0750536		Hose Restr, Spdly, Not Required, No Spdly	1
336	0015180		Roller, Horiz/Vertical, (2) Crosslays	1
337	0005248		Reel, Booster - Rear Compt., Steel, Roll-up Door	1
			Finish, Reel - Painted Gray	
338	0005279		Switch, Reel Rewind - One at Reel	1
339	0010925		Hose, Booster - 200' of 1.00"/800 PSI(100'+50'+50')	1

Line	Option	Type	Option Description	Qty
340	0005244		Capacity, Hose Reel 200' of 1"	1
341	0007428		Nozzle for Booster Reel Not Req'd	1
342	0005326		Blowout, Hose Reel - Valve at Panel	1
			Qty, - 1	
343	0015412		Foam Sys, Akron Eductor 3126-125 (Single Agent)	1
			Discharge - front crosslay	
344	0012126		Not Required, CAF Compressor	1
345	0552517		Not Required, Refill, Foam Tank	1
346	0649000		Cover, Foam Tank Dome, Hinge Location	1
			Location - forward edge of the fill dome	
347	0028553		Tag, Foam Tank	1
348	0031896		Demonstration, Foam System, Dealer Provided	1
349	0005447		Foam Cell, 30 Gallon, Not Reduce Water	1
			Type of Foam - Class "B"	
350	0091036		Drain, 1.00" Foam Tank #1	1
351	0091079		Not Required, Foam Tank #2	1
352	0091112		Not Required, Foam Tank #2 Drain	1
353	0738111		Approval Dwg, All Pump Panel(s), Includes Color And Label Tags, FLEET	1
			Num Of Truck(s) or Sim Unit, ALL Pump Pnl, Dwg - 33960	
354	0032479		Pump Panel Configuration, Control Zone	1
355	0005525		Material, Pump Panels, Side Control Brushed Stainless	1
356	0721772		Panel, Pump Access - Right Side, Front, Side Control	1
			Latch, Pump Panel Access, Side Mount - Flush Lift and Turn, Chrome,	
			AAT	
357	0005945		Light, Pump Compt	1
358	0586438		Gauges, Engine - Pump Panel, IAT Pressure Controller	1
359	0005601		Throttle, Engine, Incl'd w/Press Controller	1
360	0739224		Indicator Light @ Pump Panel, Throttle Ready, Incl w/Pressure Gov/Throttle,Green	1
361	0549333		Indicators, Engine, Included with Pressure Controller	1
362	0745568		Indicator Light, Pump Panel, Ok To Pump, Green	1
363	0786184	SP	Door, Pump Access, S/S, RS, Fill In Blank	1
			Fill in Blank - same size as customer previous unit 35304 that had a	
			compartment in this position	
364	0044860		Test Port, Electronic, Pump RPM, Waterous Pump	1
365	0005690		Gauges, 6.00" Master, Class 1, 30"-0-600psi	1
366	0005715		Gauge, 3.50" Pressure, Class 1, 30"-0-600psi	1
367	0683969		Gauge, Water Level, IC, 14-LED, PN 3030385-01	1
368	0683947		Gauge, Foam Level, Innovative Controls, 14-LED PN 3030386-01B, Class B Foam	1
369	0679660		Light Shield, S/S, On Scene Night Axe, LED	1
370	0606697		Air Horns, (2) Grover, In Bumper	1
371	0606834		Location, Air Horns, Bumper, Each Side, Outside Frame, Inboard (Pos #2 & #6)	1
372	0757092		Control, Air Horn, Multi Select	1
373	0757081		Control, Air Horn, Ft Sw, LS	1
374	0757080		Control, Air Horn, Ft Sw, RS	1
375	0006100		No Electronic Siren	1
376	0046133		No Siren Location	1
377	0076155		No Siren Switch	1
378	0006188		No Speaker	1
379	0550461		Location, Not Required, No Speaker (Q2B)	1
380	0895310		Siren, Federal Q2B	1
			Finish, Q2B Siren - Chrome	
381	0006095		Siren, Mechanical, Mounted Above Deckplate	1
			Location, Siren, Mech - a) Left	
382	0748305		Control, Mech Siren, Multi Select	1
383	0748280		Control Mech Siren, Horn Ring	1
384	0748281		Control Mech Siren, Ft Sw RS	1
385	0740834		Sw, Siren Brake, Momentary Red, LS Overhead Sw Pnl	1
386	0642299		Grounding Strap, Q2B Siren Motor to Ground Stud	1
387	0893861	SP	Control, Warning Lt Intensity, WIn, Prk Brk Released	1
388	0603446		Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	1
			Opticom Priority - b) High	
			Opticom Activation - Cab Switch & E-Master	

Line	Option	Type	Option Description	Qty
388			Momentary Opticom Activation - No Activation	
389	0898734		Filter, Whl Freedom Ltbrs - No Filters	
			Light, Front Zone, Wln M6** M6** M6** M6** Q Bzl	1
			Color, Lens, LED's - Colored	
			Color, Lt DS Frnt Outside - Left Red	
			Color, Lt PS Frnt Outside - Right Red	
			Color, Lt DS Front Inside - Left White	
			Color, Lt PS Front Inside - Right White	
			Color, Q Bezel and Trim - Polished Chrome	
390	0653937		Flasher, Headlight Alternating	1
			Headlt flash deactivation - b)w/any head lights	
391	0747228		Lights, Side Zone Lower, Wln M6**, M6**, M6**, 6Lts	1
			Location, Lights Front Side - b)each side bumper	
			Color, Lens, LED's - Colored	
			Location, Lights Mid Side - Rearward of Crew Cab Doors	
			Location, Lights Rear Side - Over Rear Wheels	
			Color, Trim - Chrome Trim	
			Color, Lt Side Front, DS - Red	
			Color, Lt Side Front, PS - Red	
			Color, Lt Side Mid DS - Blue	
			Color, Lt Side Mid PS - Blue	
			Color, Lt Side Rear PS - Red	
			Color, Lt Side Rear DS - Red	
392	0899856		Lights, Side, Wln M6**, 45 Deg Bzl, Cab Corner, 1st	2
			Qty, - 02	
			Color, Lights, Warning - Red Flashing	
			Control, Light - b) side warning	
			Color, Lens, LED's - Match	
			Material, Bracket - Polished S/S	
			Color, Trim - Chrome Trim	
393	0746422		Lights, Rear Zone Lower, Wln M6* LED, Lw Int	1
			Color, Lens, LED's - Match	
			Color, Lt DS Rear - r) DS Rear Lt Red	
			Color, Lt PS Rear - b) PS Rear Lt Blue	
			Color, Trim - Chrome Trim	
394	0680854		Light, Rear Zone Up, Wln B6M7**1P, Super LED Beacon w/M7 LED Lt	1
			Color, Lights, Warning - c) amber	
			Color, Dome, Rear Warning - b)both domes red	
			Control, Light - a) rear upper warning	
			Color, Lens, LED's - m)match LED's	
395	0006551		Not Required, Lights, Rear Upper Zone Blocking	1
396	0016610		Mtg, Rear Warn Lts, Std Mount, S/S Brkts	1
397	0762435		Light, Traffic Directing, Wln TAL85, 46.87" Long LED, Lens Feature	1
			Activation, Traffic Dir L - Not Connected	
			Color, Lens, LED's - m)match LED's	
398	0551728		Location, Traf Dir Lt, Recessed with S/S Trim	1
399	0530288		Location, Traf Dir Lt Controller, Overhead Recessed Console, above Eng Tnl DS	1
400	0076826		Cup Holder for Telescopic - Pushup - Light Pole	2
			Qty, 120/240 Volt Light - 2	
401	0780350		Receptacle Strip, 15A 120V 6-Place, Interior Cab	1
			Qty, - 1	
			Location 1 - 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear od engine tunnel and coiled loose with final install by the Customer - see photo	
			AC Power Source - Shoreline	
402	0519934		Not Required, Brand, Hydraulic Tool System	1
403	0007150		Bag of Nuts and Bolts	1
			Qty, Bag Nuts and Bolts - 1	
404	0602516		NFPA Required Loose Equipment, Pumper, NFPA 2016, Provided by Fire Department	1
405	0602407		Soft Suction Hose, Provided by Fire Department, Pumper NFPA 2016 Classification	1
406	0027023		No Strainer Required	1
407	0602538		Extinguisher, Dry Chemical, Pumper NFPA 2016 Class, Provided by Fire Department	1

Line	Option	Type	Option Description	Qty
408	0602360		Extinguisher, 2.5 Gal. Pressurized Water, Pumper NFPA 2016, Provided by Fire Dept	1
409	0602679		Axe, Flathead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
410	0602667		Axe, Pickhead, Pumper NFPA 2016 Classification, Provided by Fire Department	1
411	0741569		Paint Process / Environmental Requirements, Appleton	1
412	0709763		Paint, Single Color, Velocity/Impel	1
			Paint Color, Cab - #20 White	
413	0709845		Paint, Single Color, Body	1
			Paint, Body - Match Lower Cab	
414	0636525		Coating, Chassis Frame Assy, Hot Dip Galvanized	1
			Paint Color, Frame Assembly, Predefined - Gloss Black	
415	0693797		No Paint Required, Aluminum Front Wheels	1
416	0693792		No Paint Required, Aluminum Rear Wheels	1
417	0733739		Paint, Axle Hubs	1
			Paint, Axle Hub - Primary Job Color	
418	0788021		Coating, Hot Dip Galvanized, Water Tank Cradle, Pumper, Tankers	1
419	0007230		Compartment, Painted, Spatter Gray	1
420	0544129		Reflective Band, 1"-6"-1"	1
			Color, Reflect Band - A - e) black	
			Color, Reflect Band - B - t) gold	
			Color, Reflect Band - C - za) black	
421	0510041		Reflective across Cab Face, Imp/Vel	1
422	0536954		Stripe, Chevron, Rear, Diamond Grade, Pumper	1
			Color, Rear Chevron DG - fluorescent yellow green	
423	0027341		Jog, In Reflective Stripe, Single or Multiple	1
			Qty, - 1	
424	0515348		Stripe, Black Outline, Scotchlite on Reflective Band	1
			Qty, - 1	
425	0509398		Stripe, Reflective, Chevron, Cab and Crew Cab Doors Interior	1
			Color, Reflect Band - B - t) gold	
			Size, Chevron Striping - 04	
			Color, Reflect Chev - A - e) black	
426	0033179		Lettering Specifications, Reflective	1
427	0686159		Lettering, Reflective, 3.00", (41-60)	1
			Outline, Lettering - Outline	
428	0515269		Lettering, Reflective 2" Script w/outline	1
			Color, Lettering - e) black	
429	0041534		Emblem, (3) Letter Monogram Style with Lettering, Reflective, Denver, Each	2
			Qty, - 02	
			Location, Emblem - on the front cab doors	
			Color, Reflective - i) gold	
430	0522815		Emblem, American Flag, Waving, Gerber Vision, Pair	1
			Location, Emblem - on the rear crew cab windows	
431	0666414		Emblem, Freedom Flag, Each	1
			Qty, - 01	
			Location, Emblem - R1	
			Size, Flag - 24" - 25"	
432	3001133		For Category Load Only	1
432	0000000	STF	Allison Transmission Service & Parts Manual, Denver	1
432	0000000	STF	Intercom, David Clark Allowance for Denver Engine - 2019	1
432	0000000	STF	Oval Strapping Heron Rib - roll - RED	1
			Qty, - 1	
432	0000000	STF	Cummins Trouble Shooting and Parts Manuals, Denver	1
432	0000000	STF	Service - Oil Samples, Denver	1
432	0000000	STF	Service - Oil Change and Lube, Denver	1
432	0000000	STF	Akron 3423 Deluge, 5160 Nozzle, 3505 Bracket, 3501 Cover, Denver Engines	1
432	0000000	STF	Inspection trip #2 - when - number of people	2
			Location - at the factory for a post paint inspection	
			Qty, - 02	
432	0000000	STF	Inspection trip #1 - when - number of people	2
			Location - at the customer location for a preconstruction conference	
			Qty, - 02	

Line	Option	Type	Option Description	Qty
432	0000000	STF	Inspection trip #3 - when - number of people Location - at the factory for a delivery inspection Qty, - 02	2
433	0032773		Manuals, Two (2), Fire Apparatus Parts, & (1) CD, Custom Chassis	1
434	0002905		Manuals, (2) Chassis Service, Custom	1
435	0032433		Manuals, Two (2) Chassis Operation, Custom	1
436	0030008		Warranty, Basic, 1 Year, Apparatus, WA0008	1
437	0611136		Warranty, Chassis, 3 Year, Velocity/Impel, WA0284	1
438	0696698		Warranty, Engine, Cummins, 5 Year, WA0181	1
439	0684953		Warranty, Steering Gear, Sheppard M110, 3 Year WA0201	1
440	0595767		Warranty, Frame, 50 Year, Velocity/Impel, Dash CF, WA0038	1
441	0595698		Warranty, Axle, 3 Year, TAK-4, WA0050	1
442	0733306		Warranty, Single Axle, 5 Year, Meritor, General Service, WA0384	1
443	0652758		Warranty, ABS Brake System, 3 Year, Meritor Wabco, WA0232	1
444	0019914		Warranty, Structure, 10 Year, Custom Cab, WA0012	1
445	0744240		Warranty, Paint, 10 Year, Cab, Pro-Rate, WA0055	1
446	0524627		Warranty, Electronics, 5 Year, MUX, WA0014	1
447	0695416		Warranty, Pierce Camera System, WA0188	1
448	0708760		Warranty, Not Applicable, LED Strip Lights	1
449	0046369		Warranty, 5-year EVS Transmission, Standard Custom, WA0187	1
450	0685945		Warranty, Transmission Cooler, WA0216	1
451	0688798		Warranty, Water Tank, Lifetime, UPF, Poly Tank, WA0195	1
452	0596025		Warranty, Structure, 10 Year, Body, WA0009	1
453	0690936		Warranty, Roll up Doors, Not Required	1
454	0734463		Warranty, Pump, Waterous, 7 Year Parts, WA0382	1
455	0648675		Warranty, 10 Year S/S Pumbing, WA0035	1
456	0641372		Warranty, Foam System, Not Available	1
457	0595820		Warranty, Paint, 10 Year, Body, Pro-Rate, WA0057	1
458	0595412		Warranty, Graphics Lamination, 1 Year, Apparatus, WA0168	1
459	0683627		Certification, Vehicle Stability, CD0156	1
460	0736241		Certification, Engine Installation, Imp/Vel, Cummins L9, 2021	1
461	0686786		Certification, Power Steering, CD0098	1
462	0667417		Certification, Cab Integrity, Velocity FR, CD0009	1
463	0548950		Certification, Cab Door Durability, Velocity/Impel, CD0001	1
464	0548967		Certification, Windshield Wiper Durability, Impel/Velocit, CD0005	1
465	0667411		Certification, Electric Window Durability, Velocity/Impel FR, CD0004	1
466	0549273		Certification, Seat Belt Anchors and Mounting, Imp/Vel/Vel SLT, CD0018	1
467	0735950		Certification, Cab HVAC System Perf, Vel/Imp FR, CD0166/CD0168/CD0176/CD0177	1
468	0545073		Amp Draw Report, NFPA Current Edition	1
469	0002758		Amp Draw, NFPA/ULC Radio Allowance	1
470	0799248		Appleton/Florida BTO	1
471	0000018		PUMPER, 2ND GEN	1
472	0000012		PIERCE CHASSIS	1
473	0004713		ENGINE, OTHER	1
474	0046395		EVS 3000 Series TRANSMISSION	1
475	0020011		WATEROUS PUMP	1
476	0020009		POLY TANK	1
477	0028087		EDUCTOR FOAM SYSTEM	1
478	0020006		SIDE CONTROL	1
479	0020007		AKRON VALVES	1
480	0020015		ABS SYSTEM	1
481	0658751		PUMPER BASE	1



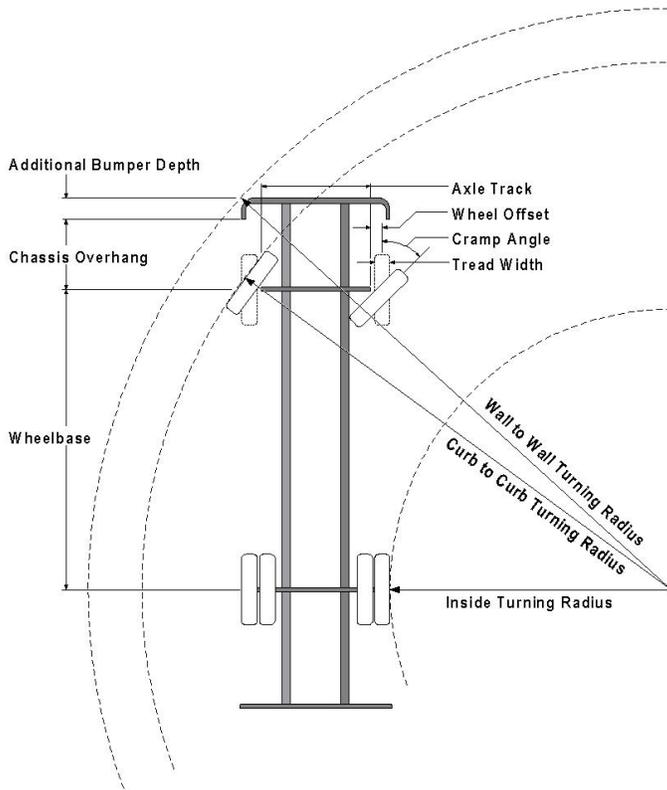
Turning Performance Analysis

11/14/2021

Bid Number: 1011

Department: Denver Fire Department

Chassis: Velocity Chassis (Med Block), 2010

Body: Pumper, Short, Aluminum, 2nd Gen

Parameters:

*Inside Cramp Angle:	45°
Axle Track:	86.17 in.
Wheel Offset:	3.12 in.
Tread Width:	12.4 in.
Chassis Overhang:	78 in.
Additional Bumper Depth:	19 in.
Front Overhang:	97 in.
Wheelbase:	175.5 in.

Calculated Turning Radii:

Inside Turn:	13 ft. 10 in.
Curb to curb:	27 ft. 0 in.
Wall to wall:	32 ft. 0 in.

Category	Option	Description
Bumpers	0123625	Bumper, 19" Extended, Imp/Vel
Wheels, Front	0019575	Wheels, Front, Alcoa, 22.50" x 9.00", Aluminum, Hub Pilot
Axle, Front, Custom	0508847	Axle, Front, Oshkosh TAK-4, Non Drive, 18,000 lb, Imp/Vel
Axle, Front, Custom	0508847	Axle, Front, Oshkosh TAK-4, Non Drive, 18,000 lb, Imp/Vel
Tires, Front	0582936	Tires, Front, Goodyear, G289 WHA, 315/80R22.50, 20 ply

Notes:

*Actual Inside cramp angle may be less than shown.

Curb to Curb turning radius calculated for 9.00 inch curb.

Definitions:

Inside CrampAngle	Maximum turning angle of the front inside fire.
Axle Track	King-pin to King-pin distance of front axle.
Wheel Offset	Offset from the center line of the wheel to the King-pin.
Tread Width	Width of the tire tread.
Chassis Overhang	Distance of the center line of the front axle to the front edge of the cab. This does not include the bumper depth.
Additional Bumper Wheel	Depth that the bumper assembly adds to the front overhang.
Wheelbase	Distance between the center lines of the vehicles front and rear axles.
Inside Turning Radius	Radius of the smallest circle around which the vehicle can turn.
Curb to Curb Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures assumes a curb height of 9 inches.
Wall to Wall Turning Radius	Radius of the smallest circle around which the vehicle's tires can turn. This measures takes into account any front overhang due to chassis , bumper extensions and or aerial devices.



Electrical Analysis

11/14/2021

Bid #: 1011
Desc: Pumper, Velocity 2021
Customer: Denver Fire Department

Job #:
Sales Rep: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0000000	Handlights, (2) Streamlight, Fire Vulcan, 44451 C4 LED, Tail lights,		0.00	1.00	0.00
0001244	High Idle w/Electronic Engine, Custom		0.00	1.20	0.00
0002526	Light, Engine Compt, All Custom Chassis		0.00	1.60	0.00
0005248	Reel, Booster - Rear Compt., Steel, Roll-up Door		0.00	36.00	0.00
0005945	Light, Pump Compt		0.00	1.80	0.00
0044860	Test Port, Electronic, Pump RPM, Waterous Pump		0.00	0.00	0.08
0079166	Batteries, (4) Exide Grp 31, 950 CCA ea, Threaded Stud		0.00	3.00	0.00
0122466	Cab Lift, Elec/Hyd, w/Manual Override, Imp/Vel		0.00	180.00	0.00
0543751	Light, Do Not Move Apparatus		0.00	0.80	0.00
0548004	Wiring, Spare, 15 A 12V DC 1st		0.00	0.00	60.00
0548006	Wiring, Spare, 15 A 12V DC 2nd		0.00	0.00	15.00
0548009	Wiring, Spare, 20 A 12V DC 1st		0.00	0.00	20.00
0549333	Indicators, Engine, Included with Pressure Controller		0.00	0.35	0.00
0551875	Lights, Backup, WIn M6BUW, LED		0.00	3.20	0.00
0559130	Mirrors, Forward Mtd, Htd/Rmt, Pierce One-Eleven		0.00	0.00	5.60
0589905	Alarm, Back-up Warning, PRECO 1040		0.00	0.50	0.00
0593760	ESC/ABS/ATC Wabco Brake System, Single Rear Axle, 2010		0.00	6.00	0.00
0631779	Light, Map, Overhead, Round Halogen, AXT/Imp/Vel/Dash CF, Hawk		0.00	0.74	0.00
0645687	Lights, Rear Scene, WIn, M6ZC LED, 1st		0.00	0.00	4.00
0653526	Camera, Pierce, Driver Mux, Rear Camera Only		0.00	1.20	0.00
0653937	Flasher, Headlight Alternating		0.00	0.00	0.08
0667902	Controls, Electric Windows, All Cab Doors, Impel/Velocity FR		0.00	26.00	0.00
0673872	Primer, Trident, Air Prime, Air Operated, Automatic		0.00	0.01	0.00
0678027	Engine Brake, Jacobs Compression Brake, Cummins Engine, with		0.00	0.42	0.00
0739892	Air Dryer, Brake, Clocking		0.00	0.00	4.70
0763248	Lights, Walk Surf, Amdor AY-LB-12HW0**, LED, Cargo Areas		0.00	0.00	0.00
0769181	Fuel/Water Separator, Special Location, Left Side Pump House		0.00	0.00	15.62
0771420	Light, Visor, WIn, 12V PSL2* Pioneer LED Spotlit, No Bracket, Denver		0.00	0.00	6.00
0774308	Lights, WIn, P*H2* Pioneer, 12 VDC, 2nd		0.00	0.00	13.00
0774309	Lights, WIn, P*H2* Pioneer, 12 VDC, 1st		0.00	0.00	13.00
0893590	Spotlight, Golight Stryker, Model 30**4ST, LED, 2 Lts		0.00	0.00	7.96
0895310	Siren, Federal Q2B		0.00	100.00	0.00
0899856	Lights, Side, WIn M6**, 45 Deg Bzl, Cab Corner, 1st		0.00	2.70	1.80
0741239	HVAC, Impel/Velocity FR, CARE	LM	0.00	0.00	136.00
0002758	Amp Draw, NFPA/ULC Radio Allowance	NFPA	5.00	0.00	0.00
0053650	LS 140" Rollup, Full Height Front & Rear	NFPA	1.10	0.00	1.10
0053657	RS 140" Rollup, Low	NFPA	1.80	0.00	1.80
0083700	Compt, Rear, Rollup, 37.75" FF, 25.88" D	NFPA	0.90	0.00	0.90
0090155	Lights, Clearance/Marker/ID, Rear, Truck-Lite 35200R LED 7Lts	NFPA	0.50	0.00	0.00
0092582	Load Manager/Sequencer, MUX	NFPA	0.56	0.56	0.00
0509649	Lights, Cab & Crw Cab Acs Stps, P25, LED w/Bezel, 1Lt Per Step	NFPA	1.00	0.00	0.00
0546803	Controller, Pressure, Class 1 Total Pressure Governor (TPG)	NFPA	1.70	0.00	0.00
0551870	Lights, Tail, WIn M6BTT* Red LED Stop/Tail & M6T* Amber LED Dir	NFPA	0.83	2.49	0.00
0552559	Steps, Stirrup, Formed, Cab & Crew Cab Doors, Imp/Vel	NFPA	0.20	0.00	0.00
0555915	Wiper Control, 2-Speed with Intermittent, MUX, Impel/Velocity	NFPA	2.10	8.40	0.00
0556360	Lights, Step, P25 LED 4lts, Pump Pnl Sw	NFPA	1.00	0.00	0.00
0568369	Cab Instruments, Ivory Gauges, Chrome Bezels, Impel/Velocity 2010,	NFPA	1.26	0.00	0.00
0586438	Gauges, Engine - Pump Panel, IAT Pressure Controller	NFPA	0.30	0.00	0.00
0587033	Air Dryer, Brake, AD-9 w/heat, 2010	NFPA	4.70	0.00	0.00
0595087	DEF Tank, 4.5 Gallon, DS Fill, Forward of Rear Axle	NFPA	0.60	11.40	0.00

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply



Electrical Analysis

11/14/2021

Bid #: 1011
Desc: Pumper, Velocity 2021
Customer: Denver Fire Department

Job #:
Sales Rep: Doucette, Duane
Organization: Front Range Fire Apparatus, Ltd

Option	Description	Type*	Minimum Load	Intermittent Load	Total Connected
0603446	Lightbar, WIn, Freedom IV-Q, 92", RRR_WR_RWOptWR_RW_RRR	NFPA	6.48	5.16	7.44
0605126	Pump Shift, Air Mnl Override, Split Shaft, Interlocked, Waterous	NFPA	1.00	0.00	0.00
0615386	Vehicle Information Center, 7" Color Display, Touchscreen, MUX	NFPA	1.20	0.00	0.00
0617874	Lights, Perimeter Pump House, Truck-Lite 44310C LED 2lts	NFPA	1.00	0.00	0.00
0631374	Lights, Deck, WIn (2) MPPBCS Micro Pioneer LED Rear Flood Lights	NFPA	6.70	0.00	0.00
0642576	Trans, Allison 5th Gen, 3000 EVS PR, Imp/Vel/Dash CF	NFPA	2.00	2.00	0.00
0647638	Lights, Dome, Weldon Dual LED 4 Lts	NFPA	0.80	0.80	0.00
0648074	Lights, Clearance/Marker/ID, Front, P25 LED 7 Lts	NFPA	0.49	0.00	0.00
0648256	Light, Directional, WIn M6T* LED Arrow, Recessed, Angle Bracket,	NFPA	1.80	2.70	0.00
0648425	Light, Directional, WIn 600 Cmb, Cab Crn, Imp/Vel/AXT/Qtm/DCF	NFPA	0.70	0.70	0.00
0648716	Headlights, Rectangular Halogen, Imp/Vel	NFPA	5.46	7.82	0.00
0664466	Bracket, License Plate & Light, Weldon 9186-23882-30 Incand, Temp	NFPA	0.69	0.00	0.00
0668315	Cab, Velocity FR, 7010 Raised Roof	NFPA	6.80	10.20	0.00
0679660	Light Shield, S/S, On Scene Night Axe, LED	NFPA	2.00	0.00	0.00
0680854	Light, Rear Zone Up, WIn B6M7**1P, Super LED Beacon w/M7 LED Lt	NFPA	6.00	0.00	0.00
0683947	Gauge, Foam Level, Innovative Controls, 14-LED PN 3030386-01B,	NFPA	0.15	0.00	0.00
0683969	Gauge, Water Level, IC, 14-LED, PN 3030385-01	NFPA	0.15	0.00	0.00
0695719	Lights, Perimeter Body, Truck-Lite 44310C LED 2lts, Rear Step	NFPA	0.50	0.00	0.00
0728314	Lights, Perimeter Cab, Truck-Lite 44310C LED, Spcl Location	NFPA	1.08	0.00	0.00
0736465	Engine, Cummins L9, 370 hp, 1250 lb-ft, W/OBD, EPA 2021, Imp/Vel	NFPA	1.00	0.00	0.00
0739224	Indicator Light @ Pump Panel, Throttle Ready, Incl w/Pressure	NFPA	0.10	0.00	0.00
0745568	Indicator Light, Pump Panel, Ok To Pump, Green	NFPA	0.10	0.00	0.00
0746422	Lights, Rear Zone Lower, WIn M6* LED, Lw Int	NFPA	1.80	2.70	0.00
0747228	Lights, Side Zone Lower, WIn M6**, M6**, M6**, 6Lts	NFPA	5.40	8.10	0.00
0762435	Light, Traffic Directing, WIn TAL85, 46.87" Long LED, Lens Feature	NFPA	2.52	2.52	0.00
0768311	Light, Directional/Marker, Intermediate, Truck-Lite 30375Y Grm Mt	NFPA	0.10	1.00	0.00
0898734	Light, Front Zone, WIn M6** M6** M6** M6** Q Bzl	NFPA	1.80	5.40	1.80
0625793	Alternator, 350 amp, Leece-Neville BLP4004H	S	0.00	0.00	0.00
Load Totals:			81.37	438.47	315.88

Note: Minimum Continuous Load is in "Blocking Right of Way" mode.(Reference current edition of NFPA 1901)

Note: Intermittent Load items are not factored in on any alternator load comparisons. These items are included on the report for reference only and should be looked at as amp draw exclusion items. (Reference current edition of NFPA 1901)

Note: Total Connected Load "Demand" represents Total Connected Load minus any Load Managed items

Alternator Output at Idle: 210.00

Minimum Continuous Load	
Supply:	210.00
Demand:	81.37
Variance:	128.63

Alternator Output at Governed Speed: 291.00

Total Connected Load	
Supply:	291.00
Demand:	261.25
Variance:	29.75

* UDMC = User Defined Mission Critical, LM = User Defined Load Managed, S = Electrical Amperage Supply

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Front Range Fire Apparatus is pleased to submit a document to Denver Fire Department for a **Pierce® triple combination pumper** per your request for quotation. The following paragraphs will describe in detail the apparatus, construction methods, and equipment proposed. This document will indicate size, type, model and make of components parts and equipment, providing proof of compliance with each and every item (except where noted) in the departments advertised specifications.

PIERCE MANUFACTURING was founded in 1913. Since then we have been building bodies with one philosophy, "BUILD THE FINEST". Our skilled craftsmen take pride in their work, which is reflected, in the final product. We have been building fire apparatus since the early "forties" giving Pierce Manufacturing over 75 years of experience in the fire apparatus market. Pierce Manufacturing has built and put into service more than 62,500 apparatus, including more than 33,900 on Pierce custom chassis designed and built specifically for fire and emergency applications. Our Appleton, Wisconsin facility has over 870,000 total square feet of floor space situated on approximately 105 acres of land. Our Bradenton, Florida facility has 300,000 square feet of floor space situated on approximately 38 acres of land.

Our beliefs in high ethical standards are carried through in all of our commitments and to everyone with whom we do business. Honesty, Integrity, Accountability and Citizenship are global tenets by which we all live and work. Consequently, we neither engage in, nor have we ever been convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market.

Pierce has only one brand of fire apparatus "Pierce", ensuring you are receiving top of the line product that meets your specification.

In accordance with the current edition of NFPA 1901 standards, this document will specify whether the fire department, manufacturer, or apparatus dealership will provide required loose equipment.

Images and illustrative material in this document are as accurate as known at the time of publication, but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

GENERAL DESIGN AND CONSTRUCTION

To control quality, ensure compatibility, and provide a single source for service and warranty, the custom cab, chassis, pump module and body will be entirely designed, assembled/welded and painted in Pierce owned manufacturing facilities. This includes, but not limited to the cab weldment, the pumphouse module assembly, the chassis assembly, the body and the electrical system.

QUALITY AND WORKMANSHIP

Pierce has set the pace for quality and workmanship in the fire apparatus field. Our tradition of building the highest quality units with craftsmen second to none has been the rule right from the beginning and we demonstrate that ongoing commitment by: Ensuring all steel welding follows American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding follows American Welding society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding follows American welding Society B2.1-2000 requirements for structural welding of sheet metal. Our flux core arc welding uses alloy rods, type 7000 and is performed to American Welding Society standards A5.20-E70T1. Furthermore, all employees classified as welders are tested

and certified to meet the American welding Society codes upon hire and every three (3) years thereafter. Pierce also employs an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

Pierce Manufacturing operates a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that are established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance is included with this document.

In addition to the Quality Management system, we also employ a Quality Achievement Supplier program to insure the vendors and suppliers that we utilize meet the high standards we demand. That is just part of our overall "Quality at the Source" program at Pierce.

To demonstrate the quality of our products and services, a list of at least twenty five (25) fire departments/municipalities that have purchased vehicles for a second time is provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. A qualified delivery representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUAL AND SERVICE INFORMATION

At time of delivery, complete operation and maintenance manuals covering the apparatus will be provided. A permanent plate will be mounted in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

At the time of delivery Pierce will also provide one (1) 39-minute, professionally produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.

SERVICE AND WARRANTY SUPPORT

Pierce dealership support will be provided by Front Range Fire Apparatus by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty five (25) miles of the fire department.

In addition to the dealership, Pierce has service facilities located in both, Weyauwega, Wisconsin and Bradenton, Florida. Pierce also maintains a dedicated parts facility of over 100,000 square feet in Appleton, Wisconsin. The parts facility stocks in excess of \$5,000,000 in parts dedicated to service and replacement parts. The parts facility employs a staff dedicated solely for the distribution and shipment of service and replacement parts.

Service parts for the apparatus being proposed can be found via Pierceparts.com which, is an interactive online tool that delivers information regarding your specific apparatus as well as the opportunity to register for training classes.

As a Pierce customer you have the ability to view the complete bill of materials for your specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations. You will also have the ability to search the complete Pierce item master through a parts search function which offers all Pierce SKU's and descriptions offered on all Pierce apparatus. Published component catalogs, which include proprietary systems along with an extensive operators manual library is available for easy reference.

Pierce Manufacturing maintains a dedicated service and warranty staff of over 35 personnel, dedicated to customer support, which also maintains a 24 hour 7 day a week toll free hot line, four (4) on staff EVTs, and offers hands-on repair and maintenance training classes multiple times a year.

LIABILITY

The successful bidder will defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:

Each Occurrence\$1,000,000

Products/Completed Operations Aggregate\$1,000,000

Personal and Advertising Injury\$1,000,000

General Aggregate\$2,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form and will include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy will include Owner as an additional insured when required by written contract.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder will, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage will be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit:\$1,000,000

UMBRELLA/EXCESS LIABILITY INSURANCE

The successful bidder will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate:\$3,000,000

Each Occurrence:\$3,000,000

The umbrella policy will be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile Liability policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence\$1,000,000

Products/Completed Operations Aggregate\$1,000,000

Coverage will be written on a Commercial General Liability form. The policy will be written on an occurrence form. The manufacturer's policy will include the owner as additional insured when required by written contract between the Owner and a Pierce authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer will, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Each Occurrence:\$25,000,000

Aggregate:\$25,000,000

The umbrella policy will be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products policies.

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage will be provided by a carrier(s) rated A- or better by A.M. Best.

All policies will provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance will provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Manufacturer agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate will show the purchaser as the certificate holder.

SINGLE SOURCE MANUFACTURER

Pierce Manufacturing, Inc. provides an integrated approach to the design and manufacture of our products that delivers superior apparatus and a dedicated support team. From our facilities, the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body will be entirely designed, tested, and hand assembled to the customer's exact specifications. The electrical system either hardwired or multiplexed, will be both designed and integrated by Pierce Manufacturing. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) will be provided by Pierce as a single source manufacturer. Pierce's single source solution adds value by providing a fully engineered product that offers durability, reliability, maintainability, performance, and a high level of quality.

Your apparatus will be manufactured in Appleton, Wisconsin.

SPECIAL INSTRUCTIONS

The apparatus being proposed will be designed and built to match the previous truck 35304. However, some variation may be necessary due to changes in our manufacturing processes or our product offering. Revisions in NFPA guidelines and/or other regulations may also affect our ability to match the previous unit.

SPECIAL INSTRUCTIONS

Options: 24 SP's - 480 Total

NFPA 2016 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on the customer approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the document as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.

A placard will be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

PUMP TEST

Underwriters Laboratory (UL) will test, approve, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.

GENERATOR TEST

If the unit has a generator, Underwriters Laboratory (UL) will test, approve, and certify the generator. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Pierce Manufacturing will draw an air sample from the air system and have the sample certified that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

BID BOND NOT REQUESTED

A bid bond will not be included. If requested, the following will apply:

All bidders will provide a bid bond as security for the bid in the form of a 5% bid bond to accompany their bid. This bid bond will be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond will be issued by an authorized representative of the Surety Company and will be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond will include language, which assures that the bidder/principal will give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle will apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle will not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision will prevail.

PERFORMANCE BOND, 1 YEAR

The successful bidder will furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond will be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this document. Owner agrees that the penal amount of this bond will be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type will not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

FINAL DRAWING

There will be a revised drawing of the truck with all the changes made during production provided at pickup.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

VELOCITY CHASSIS

The Pierce Velocity® is the custom chassis developed exclusively for the fire service. Chassis provided will be a new, tilt type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.

TARGET OVERALL LENGTH

The target overall length of the apparatus will be approximately 31' .25".

WHEELBASE

The wheelbase of the vehicle will be 175.50".

GVW RATING

The gross vehicle weight rating will be 42,000 pounds.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

FRONT NON DRIVE AXLE

The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 18,000 lb.

Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

Camber at load will be 0 degrees for optimum tire life.

The ball joint bearing will be of low friction design and be maintenance free.

Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

The wheel ends must have little to no bump steer when the chassis encounters a hole or obstacle.

The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

FRONT SUSPENSION

Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 18,000 lb.

The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

Each wheel will have a torsion bar type spring. In addition, each front wheel end will have energy absorbing jounce bumpers to prevent bottoming of the suspension.

The suspension design will have at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

The torsion bar anchor lock system allows for simple lean adjustments without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

The independent suspension completed durability testing that simulated 140,000 miles of inner city driving.

FRONT SHOCK ABSORBERS

KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

FRONT OIL SEALS

Oil seals with viewing window will be provided on the front axle.

FRONT TIRES

Front tires will be Goodyear® 315/80R22.50 radials, 20 ply G289 WHA tread, rated for 20,400 lb maximum axle load and 68 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud, 11.25" bolt circle.

TURNING RADIUS REPORT

A turning radius analysis of the custom Pierce chassis that we are proposing will be included with this document. This analysis will provide information on the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

REAR AXLE

The rear axle will be a Meritor™, Model RS-23-186, with a capacity of 24,000 lb.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 mph.

SUSPENSION, REAR

Rear suspension will be Reyco model 79KB with a ground rating of 27,000 pounds. Spring hangers and mounting components will be cast. The suspension utilizes two attaching points with variable rate spring cams and rubber bushed adjustable torque arms.

REAR OIL SEALS

Oil seals will be provided on the rear axle(s).

REAR TIRES

Rear tires will be four (4) Goodyear® 12R22.50 radials, 16 ply all season G622 RSD tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires will be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE PRESSURE MANAGEMENT

There will be a RealWheels© LED AirSecure tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of two (2) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops five (5) to eight (8) psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.

FRONT HUB COVERS

Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.

MUD FLAP EVEN WITH FENDERETTS

A mud flap will be installed so it is even with the outside fenderetts.

MUD FLAPS

Mud flaps with a Pierce logo will be installed behind the front and rear wheels.

CROSSFIRE PRESSURE LABELS

The PSI label for the Crossfire tire pressure equalization system will state 85 PSI.

AIR PRESSURE TIRE EQUALIZATION

A Crossfire air pressure equalization system will be provided on the rear dual wheels. This system will equalize the tire air pressure in the rear duals and indicate over or under inflation.

STABILIZER SYSTEM (REAR VALVE STEMS)

A valve stem stabilizer system will be provided on the rear duals.

AUTOMATIC TIRE CHAINS

One (1) pair of Rud 18 strand automatic tire chains will be provided at the rear. The system will be electric-over-air operated with a switch on the cab instrument panel. The system may be engaged at speeds up to 25 mph and operated at speeds up to 35 mph.

WHEEL CHOCKS

There will be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

Wheel Chock Brackets

There will be one (1) pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets will be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets will be mounted forward of the left side rear tire.

ELECTRONIC STABILITY CONTROL

A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.

The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system

will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.

The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

AUTOMATIC TRACTION CONTROL

An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system will be full air type.

The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance.

The brake system will be certified, third party inspected, for improved stopping distance.

The rear brakes will be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields will be provided.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor will be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system will include:

- Bendix® dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4,362 cubic inches

- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valve on each air tank

The air tank will be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

BRAKE SYSTEM AIR DRYER

The air dryer will be a Bendix AD-9, with heater and coalescing filter.

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

AIR INLET

One (1) air inlet with 3D series male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located rearward in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female fitting will also be provided with the loose equipment.

AIR OUTLET

One (1) air outlet will be installed with a female coupling and shut off valve, located in the front body compartment on driver side. This system will tie into the "wet" tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air.

Female coupling and male fitting will be .25" thread.

A mating male fitting will be provided with the loose equipment.

AIR HOSE

There will be two (2) 25' length(s) of air hose furnished with fittings.

An air chuck will be provided with the air hose. The air chuck will fit the valve stems that are provided on the tires.

AIR TANK, ADDITIONAL

An additional air tank with 1,454 cubic inch displacement will be provided to increase the capacity of the air system. This tank will be dedicated for air horn use under the DS running board per 33960

The air tank will be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

The output flow of the engine air compressor varies with engine RPM. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

AUXILLARY BRAKING SYSTEMS

When two (2) separate auxiliary braking systems are installed on a unit they will be programmed or wired to provide separate or simultaneous operation.

In this case, it will be the transmission retarder and the Jake Brake. They will be set up so when the retarder comes on, the Jake will activate at the same time.

The Jake will start on deceleration and the transmission retarder will also start on brake application.

AIR DRYER CLOCKING

The air intake line connection will be rotated 90 degrees so the intake line only requires a short 90 degree elbow.

COMPRESSOR AIR LINE

The air line from the air compressor to the remote mounted governor will be stainless steel braid in place of standard Aeroquip hose.

COMPRESSION FITTINGS ONLY

Any nylon tube on the brake system that is pneumatic will be plumbed with compression type fittings where applicable. Push lock fittings will not be acceptable for any pneumatic nylon tube plumbing.

ENGINE

The chassis will be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	L9
Power:	370 hp at 2100 rpm
Torque:	1250 lb-ft at 1400 rpm
Governed Speed:	2100 rpm
Emissions Level:	EPA 2021
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Delco Remy 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine will include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system will give the owner or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

HIGH IDLE

A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

The high idle will be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle."

ENGINE BRAKE

A Jacobs engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver will be able to turn the engine brake system on/off and have high, medium and low setting.

The high setting of the brake application will activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system will automatically disengage the auxiliary braking device, when required.

CLUTCH FAN

A Horton® fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. A compression fitting will be provided on the fan hub.

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will be stainless steel from the turbo to the engine's aftertreatment device, and will be 4.00" in diameter. The exhaust system will include a single module aftertreatment device to meet current EPA standards. An insulation wrap will be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust will terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser will be provided to reduce

the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

EXHAUST MODIFICATION

The exhaust pipe will be brought out from under the body at a 20 degree angle to the rear.

The diffuser will not be cut straight to the body, and the outer edge will extend slightly outside of the body. There will be a minimum of 2.50" from the exhaust pipe to the under side of the body heat shield. The last 7.00" of the exhaust will be free of hangers and/or clamps.

RADIATOR

The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates® silicone or a combination of silicone and rubber hoses will be used for the radiator and cab heater hoses installed by the chassis manufacturer.

The chassis manufacturer will also use Gates® brand hose on other heater and auxiliary coolant circuits. There will be some areas in which an appropriate Gates product is not available. In those instances a comparable silicone hose from another manufacturer will be used.

Rubber hoses will be used for the overhead defrost/heater system.

Hose clamps will be stainless steel constant torque type to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

RADIATOR HOSE MODIFICATION

The rubber hose at the radiator will be extended 4.00".

VINYL WINTER FRONT

A custom one-piece white vinyl winter front will be provided for use in extreme cold weather. The vinyl will cover the front cab grille and will be held in place with quarter turn fasteners. There will be an 5.50" x 16.00" opening in the center for proper ventilation.

FUEL TANK

A 65 gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.

A 0.75" drain plug will be located in a low point of the tank for drainage.

A fill inlet will be located on the left hand side of the body and is covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A 0.50" diameter vent will be installed from tank top to just below fuel fill inlet.

The fuel tank will meet all FHWA 393.67 requirements including a fill capacity of 95 percent of tank volume.

All fuel lines will be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug will be provided in a low point of the tank for drainage.

A fill inlet will be located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

FUEL PRIMING PUMP

A Cummins automatic electronic fuel priming pump will be integrated as part of the engine.

FUEL SHUTOFF

A fuel line shutoff valve will be installed on both the inlet and outlet of the primary fuel filter.

TRANSMISSION

An Allison 5th generation, model EVS 3000PR, electronic torque converting automatic transmission with retarder will be provided.

Two (2) PTO openings will be located on both sides of converter housing (positions 4 o'clock and 8 o'clock) as viewed from the rear.

A transmission temperature gauge with red light and audible alarm will be installed on the cab instrument panel.

The transmission retarder control will be activated 33 percent by release of the accelerator pedal or 66 percent by slight application of the brake pedal, or 100 percent by heavy application of brake pedal. A second on/off switch is provided to activate and deactivate the auto apply portion.

The transmission will have the 1000 ft. lb. torque (low) spring setting for retardation force.

The transmission retarder will have a master "on/off" switch on the instrument panel. Also, an amber indicator light will be provided to warn that transmission is being overworked.

The retarder will be wired to the brake lights so they are energized when the retarder is slowing the vehicle down.

The ABS system will automatically disengage the auxiliary braking device when required.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module with the four (4) + two (2) "Mode" button will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The Allison shifter will be a double-digit display model.

The transmission ratio will be 1st - 3.49 to 1.00, 2nd - 1.86 to 1.00, 3rd - 1.41 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.65 to 1.00, R - 5.03 to 1.00.

TRANSMISSION COOLER

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

An externally mounted Modine bar plate transmission oil cooler will be provided using engine coolant to control the transmission retarder oil temperature. The internal bar plates will be constructed of stainless steel. The cooler's housing will be constructed of 1020 steel, coated to protect from corrosion. The cooler will be tagged with information including OEM part number, vendor serial number and date / lot code.

TRANSMISSION FLUID LABEL

A label located on the transmission fluid fill access door will be provided. The label will read "Trans Fluid TRANSynd Only".

DOWNSHIFT MODE (W/ENGINE BRAKE)

The transmission will be provided with an aggressive downshift mode.

This will provide earlier transmission downshifts to 3rd gear from 6th gear, resulting in improved engine braking performance.

TRANSMISSION FLUID

The transmission will be provided with TES - 295 TranSynd heavy duty synthetic transmission fluid.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1710 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing the Pierce logo and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: Denver

The second row of text will be: Fire

The third row of text will be: Department

CHASSIS LUBRICATION DRUM PUMP KIT CREDIT

A Vogel drum pump kit and extra grease will not be supplied with the system.

BRACKET

There will be a bracket mounted to the cross member to support the Accumulator hose for the chassis air system.

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System will be provided. The lubrication will be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system will activate the pump after an adjustable interval time. The unit will control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab.

The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, will be located in the right rear pump house area.

- TAK- 4 Control Arm Pivot Points
- Rear Axle Slack Adjusters
- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins

BUMPER

A one (1) piece, ten (1) gauge, 304-2B type polished stainless steel bumper, a minimum of 10.00" high, will be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

The bumper will be extended 19.00" from front face of cab.

Gravel Pan

A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

CENTER HOSE TRAY

A hose tray, constructed of aluminum, will be placed in the center of the bumper extension.

The tray will have a capacity of 150' of 1.50" double jacket cotton-polyester hose.

Black rubber grating will be provided at the bottom of the tray. Drain holes are also provided.

Center Hose Tray Cover

A bright aluminum treadplate cover will be provided over the center hose tray.

The cover will be "notched" allowing the hose to be pre connected to hose connection.

The cover will be attached with a stainless steel hinge.

Two (2) flush lift and turn latch will secure the cover in the closed position and a pneumatic stay arm will hold the cover in the open position.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW HOOKS

Two (2) chromed steel tow hooks will be installed under the bumper and attached to the front frame members. The tow hooks will be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks will not be used for lifting of the apparatus.

CAB

The Velocity cab will be designed specifically for the fire service and will be manufactured by Pierce Manufacturing.

To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy duty design, constructed to the following minimal standards.

The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.

The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.

The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck

configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab will measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air

cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of 0.50" aluminum plate that is welded to both the 0.25" firewall and 0.38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The back of the engine tunnel will be no higher than 16.25" off the crew cab floor.

The engine hood will be insulated for protection from heat and sound. Perforated foil faced insulation will be over a 1.00" thick closed cell foam affixed with pressure sensitive adhesive and further secured with mechanical fasteners. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The noise insulation keeps the dBA level within the limits stated in the current NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.

Cab Lift Interlock

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.

FRONT CAB TRIM

A band of 22 gauge brushed stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two (2)-sided tape. A 0.625" self adhesive trim strip will be applied around the perimeter of the trim band.

There will be no covers provided over the painted cab corner where the cab turn signals are located.

SIDE OF CAB MOLDING

Chrome molding will be provided on both sides of cab.

MIRRORS

For enhanced visibility, safety and overall aesthetics, a forward positioned One-Eleven custom mirror will be mounted on each side of the front cab roof corner. Both front cab roof corners will be reinforced with an aluminum casting at the mounting location providing maximum stability for the mirror arm and head assembly. The mirror arm substructure will extend forward and outward of the cab and will be constructed out of 4.00" diameter, 0.25" wall, aluminum tubing. For reduced service cost, the mirror will include a dual breakaway design, controlled by a rotational detent mechanism. In the event of an impact, the mirror arm will breakaway to either the inboard or the outboard position. The One-Eleven mirror head, and injection molded arm cover, will offer a sleek aerodynamic styling with overall width of 115.80" (reduces vehicle width by 7.00" when compared to door mount bus style mirrors). The arm cover finish will be chrome. The mirror head finish will be chrome. The mirror head and arm will provide a seamless appearance, and include a black painted metal cover plate on the underside of the arm to reduce glare. For maximum visibility and safety, a flat mirror section will be provided that measures 83 square inches in reflective area. There will also be an integral convex mirror section that will measure 27 square inches in reflective area. The flat glass and convex section in each mirror will be heated and adjustable with remote controls that are convenient to the driver.

CAB DOORS

To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 76.46" high. The crew cab doors will be located on the sides of the cab and will be constructed in the same manner as the forward cab doors. The crew cab doors will measure a minimum of 37.87" wide x 85.50" high.

The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.

The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The finish of the door handle will be chrome/black. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.

A heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

A chrome grab handle will be provided on the inside of each cab and crew cab door.

A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.

The cab steps at each cab door location will be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high x 4.00" deep. The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will

contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door.

The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

CAB STEPS

The forward cab and crew cab access steps will be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps will be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps will be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps will be a minimum 31.00" wide, and the crew cab steps will be 24.25" wide with an 8.00" minimum depth. The inside cab steps will not exceed 18.00" in height and be limited to two (2) steps.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.

STIRRUP STEPS

A stirrup step will be provided below each cab and crew cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 18.50" wide x 5.00" deep stepping surface. Each step will provide a step height of 8.25" from the top of the stirrup step to the first step of the cab.

The stirrup step will be lit by a white 12 volt DC LED light provided on the step.

The step light will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights.

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

CREW CAB WINDOWS

One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high.

WINDOWS INTERIOR TRIM

For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.

FRONT WINDOWS FOR RAISED ROOF

To enhance both visibility out of and light penetration into the crew cab, two (2) bonded windows will be provided in the front slanted portion of the raised roof. Each window will be approximately 15.00" wide x 7.00" high. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive.

WINDOWS, REAR

The rear wall of the crew cab will have two (2) windows, each being 11.25" wide x 18.00" high.

WINDOW INTERIOR TRIM

For improved aesthetics, the cab rear wall windows will include a vacuum formed ABS interior trim panel.

ENCLOSURE WIRES

Stainless steel cover will be installed over the power point wires, under the cab, inside the engine tunnel, passenger side rear for protection.

CAB INTERIOR

With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.

The center console will be a high impact ABS polymer and will be easily removable.

The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.

To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.

To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.

The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be 36 oz dark silver gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

CAB INTERIOR PAINT

The following metal surfaces will be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer (not applicable for recessed dash)
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces will be painted gray, vinyl texture paint.

CAB FLOOR

The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

DEFROST/AIR CONDITIONING SYSTEM

A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

Cab Defroster

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:

- One (1) adjustable will be directed towards the left side cab window
- One (1) adjustable will be directed towards the right side cab window
- Six (6) fixed outlets will be directed at the windshield

The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce

per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.

Cab/Crew Auxiliary Heater

There will be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat risers with a dual scroll blower. An aluminum plenum incorporated into the cab structure used to transfer heat to the forward positions.

Air Conditioning

A 19.10 cubic inch compressor will be installed on the engine.

A roof-mounted condenser with a 78,000 BTU output at 2,400 SCFM that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover to be painted to match the cab roof.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets will be strategically located on the forward plenum cover per the following:

- Four (4) will be directed towards the seating position on the left side of the cab
- Four (4) will be directed towards the seating position on the right side of the cab

Adjustable air outlets will be strategically located on the evaporator cover per the following:

- Five (5) will be directed towards crew cab area

A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be hinged with two (2) thumb latches.

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

Climate Control

An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.



The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

Gravity Drain Tubes

Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.

SUN VISORS

Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

There will be no retention bracket provided to help secure each sun visor in the stowed position.

GRAB HANDLE

A black rubber covered grab handle will be mounted on the door post of the driver side and passenger side cab door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 20.00" wide x 8.25" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

CAB SAFETY SYSTEM

The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

FRONTAL IMPACT PROTECTION

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SIDE ROLL PROTECTION

The SRS system will provide protection during a fast or slow 90 degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

The SRS system will deploy the following components in the event of a side roll:

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats will be retracted to the lowest travel position
- Seat belts will be pre-tensioned to firmly hold the occupant in place

SEATING CAPACITY

The seating capacity in the cab will be six (6).

DRIVER SEAT

A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

OFFICER SEAT

A Pierce PS6® seat will be provided in the cab for the passenger. The seat will be a cam action type with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not belted.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable

from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A suspension seat safety system will be included. When activated, this system will pretension the seat belt and then retract the seat to its lowest travel position.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle. It will activate an alarm indicating a seat is occupied but not buckled.

The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) rear facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled. The seat back will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for

maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the side roll protection system:

- Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- A seat safety system will be included. When activated, this system will pretension the seat belt and firmly hold the occupant in the event of a side roll.

The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEATS

There will be two (2) forward facing, Pierce PS6® seats provided at the center position in the crew cab. For optimal comfort, the seats will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

The seat backs will be an SCBA back style with 7.5 degree fixed recline angle, and will include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will include the following feature incorporated into the side roll protection system:

- A seat safety system will be included. When activated, this system will pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.

The seats will be furnished with 3-point, shoulder type seat belts. The seat belts will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

SEAT UPHOLSTERY

All seat upholstery will be gray Turnout Tuff material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G.

There will be a quantity of five (5) SCBA brackets.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats will include a 3-point shoulder type belts only.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of six (6) seating positions will have the adjustable shoulder harness.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department will provide a location for storage of helmets.

CAB DOME LIGHTS

There will be four (4) Weldon 808* series, dual LED dome lights with grey bezels provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.

The color of the LED's will be red and white .

The white LED's will be controlled by the door switches and the lens switch.

The color LED's will be controlled by the lens switch.

OVERHEAD MAP LIGHTS

There will be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light will include a switch on the light housing.

The light switches will be connected directly to the battery switched power.

CAB SPOTLIGHT

There will be two (2) Golight® Stryker ST™, Model 30**4ST, white LED spotlights located on the cab roof, one each side. The spotlights will be mounted on painted pedestals.

These lights may be load managed when the parking brake is applied.

SPOTLIGHT CONTROLLER

There will be one (1) wired dash mounted remote provided for each spotlight.

SPOTLIGHT CONTROLLER LOCATIONS

The remotes to control the spotlights will be located one (1) within reach of the driver overhead and one (1) within reach of the officer overhead.

HAND HELD LIGHT

There will be two (2) 12v Streamlight, Fire Vulcan, Model #44451, lights mounted shipped loose.

Each light housing will be orange in color and be provided with a C4 LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs will have a dual mode of blinking or steady.

Vehicle mount with 12VDC direct wire charging rack.

Quick release buckle strap will be included.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

Gauges

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)
 - Low volts (11.8 VDC)
 - Amber indicator on gauge assembly with alarm
 - High volts (15 VDC)
 - Amber indicator on gauge assembly with alarm
 - Very low volts (11.3 VDC)
 - Amber indicator on gauge assembly with alarm
 - Very high volts (16 VDC)
 - Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel level gauge (Empty - Full in fractions)
 - Low fuel (1/8 full)
 - Amber indicator on gauge assembly with alarm
 - Very low fuel (1/32) fuel

- Amber indicator on gauge assembly with alarm
- Engine oil pressure gauge (PSI)
 - Low oil pressure to activate engine warning lights and alarms
 - Red indicator on gauge assembly with alarm
- Front air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm
 - Red indicator on gauge assembly with alarm
- Rear air pressure gauge (PSI)
 - Low air pressure to activate warning lights and alarm
 - Red indicator on gauge assembly with alarm
- Transmission oil temperature gauge (Fahrenheit)
 - High transmission oil temperature activates warning lights and alarm
 - Amber indicator on gauge assembly with alarm
- Engine coolant temperature gauge (Fahrenheit)
 - High engine temperature activates an engine warning light and alarm
 - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
 - Low fluid (1/8 full)
 - Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

Indicator Lamps

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)

- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

Alarms

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for 3 to 5 seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

Indicator Lamp and Alarm Prove-Out

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

Control Switches

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

"Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for 3 to 5 seconds. A green indicator lamp will be activated with vehicle ignition.

Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.

Custom Switch Panels

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

Diagnostic Panel

A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

Cab LCD Display

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator will not activate any alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliqué. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

SPARE CIRCUIT

There will be four (4) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 15 amps at 12 volts DC
- Power and ground will terminate two in the front of the cab behind panel #9 two in the rear, tucked into the forward facing seat riser
- Termination will be with heat shrinkable butt splicing
- Wires will be sized to 125 percent of the protection

The circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power.
- The negative wire will be connected to ground.
- Wires will be protected to 15 amps at 12 volts DC.
- Power and ground will terminate on the rear face of the dog house. Location, 1" - 2" to the right of the engine access door hinge, as near the top edge of dog house as practical with an enclosure on the inside of engine tunnel for protection - see photo..
- Termination will be with 15 amp, power point plug with rubber cover.
- Wires will be sized to 125 percent of the protection.

This circuit(s) may be load managed when the parking brake is set.

SPARE CIRCUIT

There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires will have the following features:

- The positive wire will be connected directly to the battery power
- The negative wire will be connected to ground
- Wires will be protected to 20 amps at 12 volts DC
- Power and ground will terminate officer overhead console for customer radio
- Termination will be with 3/8" studs and plastic covers
- Wires will be sized to 125% of the protection

This circuit(s) may be load managed when the parking brake is set.

DASH PANEL RECESS

The dash panel across from the officer will be recessed to accommodate the mounting of miscellaneous items. The recess will be 7.25" down x 7.81" back and 20.88" wide.

INFORMATION CENTER

An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.

The information center will have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel will be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

General Screen Design

Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.

If a caution or warning situation arises the following will occur:

- An amber background/text color will indicate a caution condition
- A red background/text color will indicate a warning condition

- The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.

Home/Transit Screen

This screen will display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

On Scene Screen

This screen will display the following and will be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

Virtual Buttons

There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

Page Screen

The page screen will display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock
 - Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)
 - Load Manager
 - A list of items to be load managed will be provided. The list will provide a description of the load.
 - The lower the priority numbers the earlier the device will be shed should a low voltage condition occur.
 - The screen will indicate if a load has been shed (disabled) or not shed.
 - "At a glance" color features are utilized on this screen.
 - Systems
 - Command Zone
 - Module type and ID number
 - Module Version
 - Input or output number
 - Circuit number connected to that input or output
 - Status of the input or output
 - Power and Constant Current module diagnostic information
 - Foam (if equipped)
 - Pressure Controller (if equipped)
 - Generator Frequency (if equipped)
 - Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam (if equipped)
 - Aerial (if equipped)
- Setup
 - Clock Setup
 - Date & Time
 - 12 or 24 hour format
 - Set time and date
 - Backlight
 - Daytime
 - Night time
 - Sensitivity

- Unit Selection
- Home Screen
- Virtual Button Setup
- On Scene Screen Setup
- Configure Video Mode
 - Set Video Contrast
 - Set Video Color
 - Set Video Tint
- Do Not Move
 - The screen will indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices will be indicated
 - Driver Side Cab Door
 - Passenger's Side Cab Door
 - Driver Side Crew Cab Door
 - Passenger's Side Crew Cab Door
 - Driver Side Body Doors
 - Passenger's Side Body Doors
 - Rear Body Door(s)
 - Ladder Rack (if applicable)
 - Deck Gun (if applicable)
 - Light Tower (if applicable)
 - Hatch Door (if applicable)
 - Stabilizers (if applicable)
 - Steps (if applicable)
- Notifications
 - View Active Alarms
 - Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
 - Silence Alarms - All alarms are silenced
- Timer Screen
- HVAC (if equipped)
- Tire Information (if equipped)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

COLLISION MITIGATION

There will be a HAAS Alert®, Model HA5 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA5 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degree C to 85 degree C.

The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA5 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA5 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA5 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

VEHICLE DATA RECORDER

There will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder will be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen will become active on the Command Zone color display when:

- The home screen is active:
 - and there is any occupant seated but not buckled or any belt buckled with an occupant.
 - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.

The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

RADIO ANTENNA MOUNT

There will be one (1) standard 1.125", 18 thread, NMO type antenna mounting base(s) installed just to the rear of officer seat on the cab roof with high efficiency, low loss, coaxial cable(s) routed within the cab / crew area to front passenger side corner of the raised roof . A weatherproof cap will be installed on the mount.

VEHICLE CAMERA SYSTEM

There will be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.

The following components will be included:

- One (1) SV-CW134639CAI, camera
- One (1) amplified speaker (if applicable)
- All necessary cables

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

Solid-State Control System

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

- Module circuit board will meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

Circuit Protection and Control Diagram

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

On-Board Advanced/Visual Electrical System Diagnostics

The on-board information center will include the following diagnostic information:

- Text description of active warning or caution alarms
- Simplified warning indicators
- Amber caution indication with intermittent alarm
- Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, will contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs will be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output will be provided and will illuminate whenever the respective input or output is active. Color-coded labels within the modules will encompass the LEDs for ease of identification. The LED indicator lights will provide point of use information for reduced troubleshooting time without the need for an additional computer.

Tech Module with WiFi

An in cab module will provide WiFi wireless interface and data logging capability. The WiFi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module will transmit a password protected web page to a WiFi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.

The data logging capability will record faults from the engine, transmission, ABS and Command Zone™, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

Prognostics

A software based vehicle tool will be provided to predict remaining life of the vehicles critical fluid and events.

The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics will include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

Advanced Diagnostics

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

Indicator Light and Alarm Prove-Out System

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

Voltage Monitor System

A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

Dedicated Radio Equipment Connection Points

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

- The studs will consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

Enhanced Software

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for 10 seconds for improved visibility after the doors close. The dome lights will dim after 10 seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for 10 seconds for improved visibility after the doors close. The dome lights will dim after 10 seconds or immediately if the vehicle is put into gear.

EMI/RFI Protection

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10KHz-1GHz to 100 Volts/Meter requirements.

EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

ELECTRICAL

All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

6. All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

The results of the tests will be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

There will be four (4) 12 volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45 degree tilt capacity.

The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

BATTERY SYSTEM

There will be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

MASTER BATTERY SWITCH

There will be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The

compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER

There will be a Kussmaul™ 1200, Model 091-187-12-Remote, battery charger provided. A bar graph display indicating the state of charge will be provided.

The charger will have a maximum output of 40 amps and a fully automatic regulation.

The battery charger will be wired to the AC shoreline inlet through an AC receptacle adjacent to the battery charger.

The battery charger will be located in the left body compartment mounted on the back wall as high as possible.

The battery charger indicator will be located near the driver's seat riser with special bracketry.

KUSSMAUL AUTO EJECT FOR SHORELINE

There will be one (1) Kussmaul Model 091-55-15-120, 15 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus without the use of the generator.

The shoreline inlet(s) will include yellow weatherproof flip up cover(s).

There will be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline(s) will be connected to the battery charger and the 6 place outlet in the crew cab.

There will be a mating connector body supplied with the loose equipment.

There will be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle will be located on the driver side rear bulkhead of body.

COVER IO MODULE

A cover will be fabricated and installed to the rear face of the driver side battery box to cover the electrical IO modules for protection. The cover will protect the modules from the outside elements as much as possible without having to be water tight.

ALTERNATOR

A Leece-Neville, Model BLP4004H, alternator will be provided. It will have a rated output current of 350 amp as measured by SAE method J56. The alternator will feature an integral, self diagnostic regulator and rectifier. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

WIRE COVER

There will be a stainless steel wire cover provided for the electrical connections inside the driver side, forward location in the pump house.

WEATHER PACK CONNECTORS SEALED

All unused open Weather Pack connectors will be plugged with mating tower and shroud connectors and cavity plugs.

NO GRAY SEALER REQUIRED

No gray dial electric sealer will be placed on any of the electrical connections.

The exception to this will be the fuel sender terminal. The fuel sender terminal will be sealed.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.
- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - If enabled:
 - "Load Man Hi-Idle On" will display on the information center.
 - Hi-Idle will not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
 - ON = not shed
 - SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There will be four (4) rectangular halogen lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side will contain a halogen low and high beam module.
- The inside light on each side will contain a halogen high beam module only.

DIRECTIONAL LIGHTS

There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights.

The color of the lenses will be the same color as the LED's.

ADDITIONAL DIRECTIONAL LIGHTS

There will be two (2) Whelen, Model M6T*, amber LED arrow directional lights provided on the exterior back of the cab, one (1) on each side. The lens color(s) to be the same as the LEDs.

These lights will be mounted low on the back wall of the crew cab in 15 degree recessed angle brackets.

INTERMEDIATE LIGHT

There will be two (2) Truck-Lite®, part number 303757Y, 2.24" diameter lights with amber LEDs, grommet mount and chrome cover furnished, one (1) each side in the rear fender panel. The light will double as a turn signal and marker light.

CAB CLEARANCE/MARKER/ID LIGHTS

There will be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

- Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

REAR CLEARANCE/MARKER/ID LIGHTING

There will be three (3) Truck-Lite®, Model 35200R, LED lights used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

There will be two (2) Truck-Lite, Model 35200R, LED lights installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline

- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

There will be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

- Two (2) Whelen®, Model M6BTT, red LED stop/tail lights
- Two (2) Whelen, Model M6T, amber LED arrow turn lights

The lights will be provided with color lenses.

Each light will be installed separately at the rear with Whelen, Model M6FC, chrome flanges.

There will be two (2) Whelen Model M6BUW, LED backup lights with chrome trim provided.

LICENSE PLATE BRACKET

There will be one (1) Weldon, Model 0J10-0393-00, license plate bracket located below the tailboard on a removable bolt-on bracket located driver side.

A Weldon, Model 9186-23882-30, incandescent step light will illuminate the license plate.

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

BACK-UP OBSTACLE SENSING SYSTEM

A SenseStat ultrasonic backing sensor system with 4 individual zones and an LED distance display will be provided.

The system will detect objects that are up to eight (8) feet from the rear of the vehicle reading each of four (4) separate sensors, and displaying the distance to the one that is closest to an object.

A 3.5"W x 2.9"L x 1.6"H, four (4) column color LED display located next to driver will show the direction and location of the obstacle. The display will show the distance from the sensor to the obstacle in meters or in feet & fractions of a foot to the sensor that is closest to an object. There will be an audible alarm with volume control integrated into the display.

PERIMETER SCENE LIGHTS, CAB

There will be a Truck-Lite®, Model 44310C, 4.00", 12 volt DC white LED light, with Model 40700 grommet mount and Model 95948 pigtail provided for each cab access door. Lighting will be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits. The lights will be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

Each light will be installed in an angle bracket, and be mounted high on the angled portion of each cab access step.

PUMP HOUSE PERIMETER LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" white LED 12 volt DC weatherproof lights with Model 40700, grommets provided under the pump panel running boards, one (1) each side.

The lights will be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There will be two (2) Truck-Lite, Model 44310C, 4.00" 12 volt DC LED lights with Model 40700, grommet provided under the rear step area on the body, one (1) each side shining to the rear.

The perimeter scene lights will be activated by a a switch within reach of the driver is activated.

STEP LIGHTS

Four (4) white LED step lights will be provided. One (1) step light will be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

These step lights will be actuated with the pump panel light switch.

All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.

CUP SWITCH

There will be a stainless steel cup switch at the rear of the truck for rear body bulkhead passenger side same as job #35304 lights.

12 VOLT LIGHTING

There will be one (1) Whelen® Pioneer™, Model PSL2*, 12 volt DC LED floodlight(s) provided on the front of the cab, centered. The light will be mounted directly to the cab and not on a bracket.

The painted parts of this light assembly to be white.

The lights will be steady burning with the selected switch features.

The light will be controlled by the following:

- a switch at the driver's side switch panel

- a switch at the passenger's side switch panel
- no additional switch location
- no additional switch location

These light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H2*, 17,750 lumens 12 volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, back of cab passenger side.

The light(s) to be installed on push up side mount outside pole length to be 20.00" long with a handle holder and sensor connecting the pole to the Do Not Move Truck Indicator circuit.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the left side pump panel.

The light(s) may be load managed when the parking brake is applied.

12 VOLT DC SCENE LIGHTS

There will be one (1) Whelen® Model P*H2*, 17,750 lumens 12 volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, back of cab driver side.

The light(s) to be installed on push up side mount outside pole length to be 20.00" long with a handle holder and sensor connecting the pole to the Do Not Move Truck Indicator circuit.

The painted parts of this light assembly to be white.

The lights will be activated by a switch at the left side pump panel.

The light(s) may be load managed when the parking brake is applied.

DECK LIGHTS

There will be two (2) Whelen®, Model MPPBCS, black with chrome housing 12 volt DC LED floodlights with on/off switch. Each light will be provided with a low profile pedestal/swivel mount provided at the rear of the hose bed, one (1) each side.

The lights will be activated by the switch included on the light(s).

REAR SCENE LIGHT(S)

There will be two (2) Whelen®, Model M6ZC, LED scene light(s) with chrome flange(s) installed at the rear of the apparatus, two (2) low height on the rear body bulkhead.

The light(s) will be controlled by a switch at the driver's side switch panel.

The light(s) may be load managed when the parking brake is applied.

WALKING SURFACE LIGHTS

There will be One (1) Amdor®, Model AY-LB-12HW0**, white 12 volt DC LED strip light(s) provided in the cargo area(s) to illuminate the interior surface of the cargo area(s). Light(s) will be under the rear flange.

The light will be activated when the body step lights are on.

WATER TANK

Booster tank will have a capacity of 500 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

Tank joints and seams will be nitrogen welded inside and out.

Tank will be baffled in accordance with NFPA bulletin 1901 requirements.

Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

All partitions will interlock and will be welded to the tank bottom and sides.

Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump that will be sized dependent on the tank to pump plumbing will be provided at the bottom of the water tank.

Sump will include a drain plug and the tank outlet.

Tank will be installed in a fabricated cradle assembly constructed of structural steel.

Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system will be approved by the tank manufacturer.

Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

HOSE BED

The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

Upper and rear edges of side panels will have a double break for rigidity.

The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.

The hose bed interior will be painted to match the lower body color..

Hose bed will accommodate 300' X 1.75", 500' X 2.5", 500' X 2.5", 500' X 2.5", 300' X 1.75".

HOSE BED DIVIDER

Four (4) adjustable hosebed dividers will be furnished for separating hose.

Each divider will be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.

Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider will be held in place by tightening bolts, at each end.

Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

HOSEBED HOSE RESTRAINT

A 22 oz yellow hosebed cover will be furnished with permanent attachment at the front and STAYPUT™ shock cord loop fasteners on the sides. There will be STAYPUT™ shock cord loop fasteners at the bottom of the rear body sheet below the hosebed. The STAYPUT™ shock cord loop fasteners will be spaced at 12.00" intervals as practical along the sides and rear of the cover. The flap at the rear will be not weighted.

FILL DOME ACCESS

There will be two (2) fill dome(s) accessed through the vinyl hose bed cover. A flap(s) with Velcro® strips will be provided in the vinyl hose bed cover for access to the fill dome(s) without removing the front portion of the cover. The flap will be permanently attached along the forward edge.

RUNNING BOARDS

Running boards will be fabricated of .125" bright aluminum treadplate.

Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure.

Running boards will be 12.75" deep and spaced .50" away from the pump panel.

A splash guard will be provided above the running board treadplate.

TAILBOARD

The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area will be 16.00" deep.

The exterior side will be flanged down and in for increased rigidity of tailboard structure.

REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL

The rear facing surfaces of the center rear wall will be smooth aluminum.

The bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body.

Any inboard facing surfaces below the height of the hosebed will be aluminum diamondplate.

TOW BAR

A tow bar will be installed under the tailboard at center of truck.

Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail.

Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

REAR BUMPER

A bright aluminum treadplate bumper will be provided at the rear of the truck. The bumper will be approximately 4.00" high, full width, it will be located at the rear of the truck. The bumper will be approximately 9.25" deep and mounted just below the body. The rear edge of the bumper will be raised.

Morton Cass will be inserted in the running boards.

Morton Cass will be inserted in the tailboard.

COMPARTMENTATION

Body and compartments will be fabricated of .125", 5052-H32 aluminum.

Side compartments will be an integral assembly with the rear fenders.

Circular fender liners will be provided for prevention of rust pockets and ease of maintenance.

Side compartment flooring will be of the sweep out design with the floor higher than the compartment door lip.

The side compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.

Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded.

Side compartment covers will be separate from the compartment tops.

Front facing compartment walls will be covered with bright aluminum treadplate.

All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.

The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame will be mounted on the top of these supports to create a floating substructure which will result in a 500 lb equipment support rating per lower compartment.

The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators will have a broad load range, proven viability in vehicular applications, be of a fail safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

AGGRESSIVE WALKING SURFACE

All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.

LOUVERS

Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN

Body structural analysis has been fully tested. Proven engineering and test techniques such as finite element analysis, stress coating and strain gauging have been performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

Body will be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure will include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of actual testing techniques will be made available upon request.

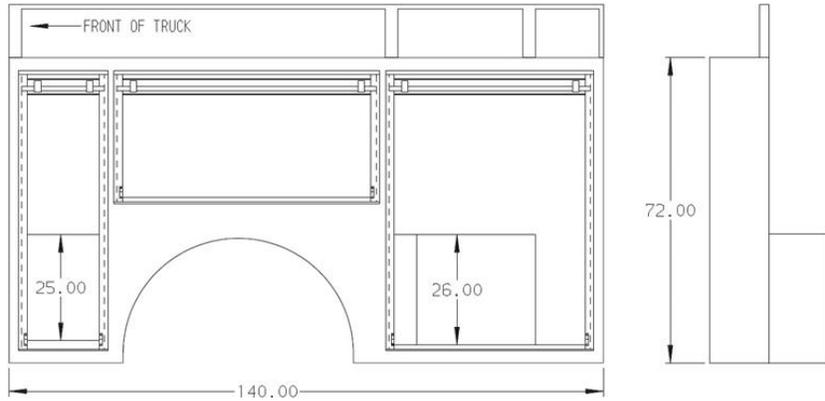
LEFT SIDE COMPARTMENTATION

The left side compartmentation will consist of three (3) rollup door compartments.

A full height, rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 22.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 16.75" wide x 56.88" high.

A rollup door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening will be a minimum of 58.25" wide x 23.13" high.

A full height, rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 67.63" high x 12.00" deep. A section of this compartment will be 25.88" deep for the first 31.50" width x 26.00" height directly behind the rear wheels. The clear door opening will be a minimum of 44.75" wide x 57.88" high.



COMPARTMENT	CLEAR DOOR OPENINGS					
	AMDOR		GORTITE		ROM	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
Ahead of axle	17.50	56.88	16.75	58.00	16.94	58.25
Over axle	59.00	23.13	58.25	24.25	58.44	24.50
Behind axle	45.50	57.88	44.75	59.00	44.94	59.25

The interior height of the compartments will be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments will be measured from the back wall to the inside of the door frame.

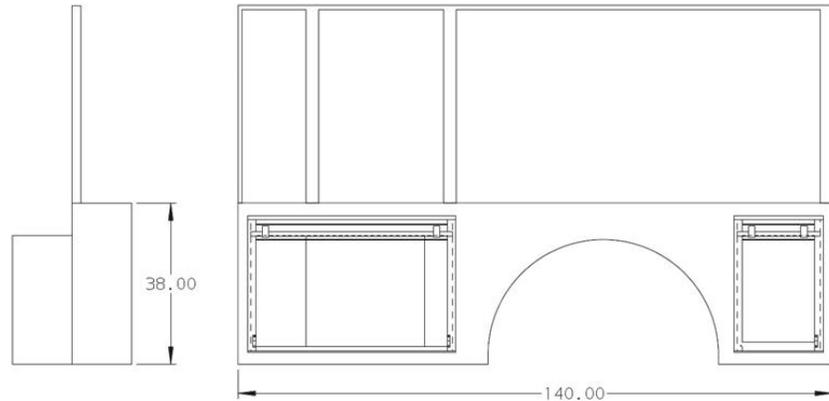
Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

RIGHT SIDE COMPARTMENTATION

The right side compartmentation will consist of two rollup door compartments.

A rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 22.50" wide x 32.62" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 16.75" wide x 22.88" high.

A rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 33.63" high x 12.00" deep. A section of this compartment will be 25.88" deep for the first 31.50" width x 26.00" height directly behind the rear wheels. The clear door opening will be a minimum of 44.75" wide x 23.88" high.



COMPARTMENT	CLEAR DOOR OPENINGS					
	AMDOR		GORTITE		ROM	
	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
Ahead of axle	17.50	22.88	16.75	24.00	16.94	24.25
Behind axle	45.50	23.88	44.75	25.00	44.94	25.25

The interior height of the compartments will be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments will be measured from the back wall to the inside of the door frame.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

SIDE COMPARTMENT ROLLUP DOOR(S)

There will be five (5) compartment doors installed on the side compartments, double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand rollup doors.

Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A polished stainless steel lift bar to be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded rollup door wear components will be constructed of Type 6 nylon.

Each rollup door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

REAR COMPARTMENTATION

A roll-up door compartment above the rear tailboard will be provided.

The interior dimensions of this compartment will be 40.00" wide x 40.63" high x 25.88" deep. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartment will be calculated with the compartment door closed.

A louvered, removable access panel will be furnished on the back wall of the compartment.

The rear compartment will be open into the rear side compartments.

The clear door opening of this compartment will be a minimum of 33.25" wide x 30.88" high.

Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

ROLLUP REAR COMPARTMENT DOOR

The rear compartment will have a rollup door.

The door will be double faced, aluminum construction, satin aluminum and manufactured by AMDOR™ brand rollup doors.

The door will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.

The door will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A polished stainless steel lift bar to be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded rollup door wear components will be constructed of Type 6 Nylon.

The door will have a 3.00 inch diameter balancer/tensioner drum to assist in lifting the door.

The header for the rollup door assembly will not exceed 4.00".

A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

SCUFFPLATE

A brushed stainless steel scuffplate shall installed on the sides of the hosebed area both sides and front. This scuffplate shall cover from the top flange of the hosebed area down to the hosebed grating. The scuffplate shall be fastened with self tapping screws.

COMPARTMENT LIGHTING

There will be six (6) compartments with On Scene Solutions LED compartment light strips. The compartments with these strip lights will be located each compartment. Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening. The lights will be sized to accommodate the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door, will automatically turn the compartment lighting on.

MOUNTING TRACKS

There will be two (2) sets of tracks for mounting shelf(s) in upper portion of LS1 and RS1. These tracks will be installed vertically to support the adjustable shelf(s), and will be full height of the compartment. The tracks will be painted to match the compartment interior.

ADJUSTABLE SHELVES

There will be three (3) shelves with a capacity of 500 lb provided.

The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides.

Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track.

The shelves will be held in place by .12" thick stamped plated brackets and bolts.

The location(s) will be in RS1 in the lower third, in LS1 in the upper third and in LS1 in the upper third.

PARTITION, TRANSVERSE REAR COMPARTMENT

Two (2) partitions will be bolted in place to separate the left and right side rear compartments from the rear tailboard compartment. The partition will be body material painted spatter gray.

ACCESS PANEL

A removable access panel will be provided in the left front compartment . This panel will be size to fit and will be held in place with 1/4 turn fasteners. It will provide access to intake relief valve.

RUB RAIL

Bottom edge of the side compartments and rear rails will be trimmed with a bright aluminum extruded rub rail.

Trim will be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails will not be an integral part of the body construction, which allows replacement in the event of damage.

The rub rails will be spaced out far enough to protect the lift bars on the rollup doors.

BODY FENDER CROWNS

Polished stainless steel fender crowns will be provided around the rear wheel openings with a dielectric barrier will be provided between the fender crown and the fender sheet metal to prevent corrosion.

The fender crowns will be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion. Rubber welting will be provided between the body and crown.

BODY FENDER LINER

A painted to match the lower body color fender liner will be provided. The liners will be removable to aid in the maintenance of rear suspension components.

HARD SUCTION HOSE

Hard suction hose will not be required.

HANDRAILS

The handrails will be 1.25" diameter knurled aluminum to provide a positive gripping surface.

Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces.

Drain holes will be provided in the bottom of all vertically mounted handrails.

Handrails will be provided to meet NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.

- One (1) full length, vertical handrail will be mounted on the left side rear beavertail.
- One (1) standard length offset handrail will be mounted on the right side rear beavertail.

- One (1) horizontal handrail will be provided above the hose bed at the rear of the apparatus. The hose bed dividers do not require additional reinforcement.
- One (1) full width horizontal handrail will be provided below the hose bed at the rear of the apparatus.

AIR BOTTLE STORAGE (SINGLE)

A quantity of four (4) air bottle compartments, approximately 7.50" wide x 7.50" tall x 26.00" deep, will be provided on the left side forward of the rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels. The compartment will be square with angled corners. A polished stainless steel door with a chrome plated flush lift & turn latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting will be provided.

MOUNTING TRACKS

There will be one (1) pair of horizontal mounting tracks provided for mounting air bottle brackets in LS2. Each pair of mounting tracks will be provided with three (3) pair of mounting studs.

EXTENSION LADDER

There will be a 24', two (2) section, aluminum, Duo-Safety, Series 900-A extension ladder provided.

ROOF LADDER

There will be a 14' aluminum, Duo-Safety, Series 775-A roof ladder provided.

LADDER BRACKETS

The ladders will be installed on the right side of the hose body in lined brackets and held in place by chrome plated, quarter-turn spring loaded clamps. The clamps will be such that when the roof ladder is removed, the clamps can be moved a half turn to hold the extension ladder in place. The ladder brackets will be adjustable up and down.

FOLDING LADDER PROVIDED BY DEALER

NFPA 1901, 2016 edition, section 5.8.1.2 requires a folding ladder.

The folding ladder is not on the apparatus as manufactured. There will be one (1) 10' aluminum Series 585-A Duo-Safety folding ladder provided by the dealer. The ladder will be installed in a stainless steel trough mounted above the ladders on the ladder brackets.

BACKBOARD STORAGE TROUGH

A trough will be provided for storage of two (2) backboards behind the ladder brackets. The interior dimensions of the trough will be 3.00" wide x 17.00" high x 146.00" long. There will be a 3.00" lip on the upper and lower outer portions of the trough, with the remaining space in between left open to allow movement of the backboards from the front to the rear and vice versa. A Velcro® strap will be provided at the rear to retain the backboards in the trough.

10' PIKE POLE

One (1) pike pole 10' long DUO Safety with a fiberglass handle will be provided.

PIKE POLE, 6'

One (1) pike pole, 6' long Duo Safety with a fiberglass handle, will be provided.

PIKE POLE STORAGE

Chrome plated tulip clips will be used for pike pole storage and will be over the left and right compartments - no rubber coating on clips, inboard as far as possible. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate will be provided.

STEPS

An Eberhard bright finished folding type step will be provided on the front of each fender compartment.

REAR STEPS

Bright aluminum treadplate corner steps will be provided at the rear. All steps will provide adequate surface for stepping.

Two (2) additional folding steps, Eberhard, will be located driver side front bulkhead.

PUMP COMPARTMENT

The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. The pump compartment will be constructed of the same material as the body compartmentation.

The pump compartment substructure will be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment will be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels will be removable from the chassis in a single assembly.

PUMP MOUNTING

Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

LEFT SIDE PUMP CONTROL PANEL

All pump controls and gauges will be located at the left (driver's) side of the apparatus and properly identified.

Layout of the pump control panel will be ergonomically efficient and systematically organized.

The pump operator's control panel will be removable in two (2) main sections for ease of maintenance:

The upper section will contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels will be removable from the face of the pump panel for ease of maintenance. Below the sub panels will be located all valve controls and line pressure gauges.

The lower section of the panel will contain all inlets, outlets, and drains.

All push/pull valve controls will have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods will be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls will be capable of locking in any position. The control rods will pull straight out of the panel and will be equipped with universal joints to eliminate binding.

IDENTIFICATION TAGS

The identification tag for each valve control will be recessed in the face of the tee handle.

All discharge outlets will have color coded identification tags, with each discharge having its own unique color. Color coding will include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges will be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting will be removable from the face of the pump panel for ease of maintenance. The casting will be color coded to correspond with the discharge identification tag.

All remaining identification tags will be mounted on the pump panel in chrome plated bezels.

The pump panel on the right (passenger's) side will be removable with lift and turn type fasteners.

Trim rings will be installed around all inlets and outlets.

COVER, CARGO COMPARTMENT

A 22 oz yellow vinyl cover will be provided over each cargo compartment. The cover will be secured with an awning rail at the front and Velcro® fasteners on the sides and rear. A quantity of one (1) cover(s) will be required.

PUMP

Pump will be a Waterous CSU, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump will be the class "A" type.

Pump will deliver the percentage of rated discharge at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure.

-70% of rated capacity at 200 psi net pump pressure.

-50% of rated capacity at 250 psi net pump pressure.

Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves will be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges will be used.

Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.

Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.

The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.

In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.

Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

PUMP TRANSMISSION

The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.

PUMPING MODE

An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.

AIR PUMP SHIFT

Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the left side pump panel.

Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump".

The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

The pump shift control in the cab will be illuminated to meet NFPA requirements.

TRANSMISSION LOCK-UP

The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.

AUXILIARY COOLING SYSTEM

A supplementary heat exchange cooling system will be provided to allow the use of water from the discharge side of the pump for cooling the engine water. The heat exchanger will be a separate unit. The heat exchanger will be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger will be plumbed to the master drain valve.

INTAKE RELIEF VALVE - PUMP

There will be One (1) Waterous Model #83827 relief valve(s) installed on the suction side of the pump preset at 125 psig.

The relief valve(s) will have a working range of 50 psi to 250 psi.

The outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag.

PRESSURE GOVERNOR

This apparatus will be equipped with a Class1 "Total Pressure Governor" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The "Total Pressure Governor" is to operate as a pressure sensor (regulating) governor (PSG).

A special preset feature will permit a predetermined pressure of RPM to be set. The preset pressure or RPM will be displayed on the message display of the "Total Pressure Governor". The preset will be easily adjustable by the operator

The pressure sensor governor system will be operable only after the vehicle parking brake has been set, the transmission is the pumping mode, and the fire pump has been engaged.

The pressure sensor governor system will have two (2) modes of operation: pressure mode or rpm mode.

When in the pressure mode, the PSG system will automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).

In the rpm mode, the PSG system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).

A pump cavitation protection feature will be provided which will return the engine to idle should the pump cavitate.

The pressure controller will incorporate monitoring for engine coolant temperature, oil pressure, and battery voltage.

PRIMING PUMP

The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control will open the priming valve and start the pump primer. The control will have a three position switch for automatic, off or test. In the sentry mode (automatic) the primer will sense when the pump losses discharge pressure and start the pump primer. The primer will automatically stop once the pump has pressure.

DRAINS- SPECIAL INSTRUCTIONS

All valves drains/bleeders will be tapped into the lowest point of each plumbing discharge and inlet. (This includes the ports on each valve as well).

THERMAL RELIEF VALVE

A Waterous Overheat Protection Manager (OPM) will be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 140 Degrees F (60 C) and a red warning light that is triggered when the water in the pump reaches 180 F (82 C).

The warning light will act as an additional protection device if the temperature in the pump keeps rising after the valve opens. The warning light with a test switch will be mounted on the pump operator panel.

The discharge line will be plumbed to ground.

PUMP MANUALS

There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless steel couplings. All stainless steel hard plumbing will be a minimum of a schedule 10 wall thickness.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings.

Plumbing manifold bodies will be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame.

All water carrying gauge lines will be of flexible polypropylene tubing.

All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.

FOAM SYSTEM PLUMBING

All piping that is in contact with the foam concentrate or foam/water solution will be stainless steel. The fittings will be stainless steel or brass. Cast iron pump manifolds will be allowed.

MAIN PUMP INLETS

A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

SHORT SUCTION TUBE(S)

The suction tube(s) on the water pump will have short suction tube(s) installed to allow for installation of adapters, elbows or intake valves without excessive overhang.

INLET VALVES WITH INTAKE RELIEF VALVE

There will be Two (2) Akron Brass Revolution 7982 (30 degree swivel inlet) manually operated aluminum ball intake valve(s) provided right and left side .

The inlet connection will be 5.0" Storz with a cap and the outlet connection will be 6.0" FNST swivel long handle .

A 12.5" diameter handwheel will be included to operate valve open and close functions. A position indicator will be included to indicate position of the ball.

The ball intake valve will be equipped with an adjustable pressure relief valve. The relief valve will have a working range of 50 PSI to 250 PSI.

A 3/4" bleeder/drain valve will be provided on the ball intake valve to exhaust excess air or water from the valve.

The Intake Valve will be constructed of lightweight, corrosion-resistant, hard-anodized aluminum and stainless steel. To protect against corrosion, the casting will be coated with a powder coat finish and all components on the wet side of the valve will be constructed from stainless steel.

VALVES

Three (3) full flow Waterous valves will be used for the side 2.50" discharges. All remaining ball valves, 3.00" or less, will be Akron Brass brand.

The Waterous valves will have a solid bronze ball that is chromium plated for a hard, durable surface. The spring loaded floating seal assembly requires no adjustment yet provides a tight seal against both pressure and vacuum pressures.

The Akron valves will be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

The location of the valve for the two (2) inlets will be recessed behind the pump panel.

INLET CONTROL

The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism will indicate the position of the valve.

LEFT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

RIGHT SIDE INLET

There will be one (1) auxiliary inlet with a 2.50" valve at the right side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet will be provided with a strainer, chrome swivel and plug.

INLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails.

TANK TO PUMP

The booster tank will be connected to the intake side of the pump with stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing.

A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL

A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

DISCHARGE OUTLET CONTROLS

The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve.

If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 16.7.5.3.

LEFT SIDE DISCHARGE OUTLETS

There will be One (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

LEFT SIDE OUTLET ELBOWS

The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

RIGHT SIDE DISCHARGE OUTLETS

There will be Two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

RIGHT SIDE OUTLET ELBOWS

The 2.50" discharge outlets located on the right side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

LARGE DIAMETER DISCHARGE OUTLET

There will be a 5.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a 5.00" (M) National Standard hose thread adapter. This discharge outlet will be actuated with a handwheel control at the pump operator's control panel.

An indicator will be provided to show when the valve is in the closed position.

LARGE DIAMETER OUTLET ELBOWS

The 5.00" outlet will be furnished with a 5.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

FRONT DISCHARGE OUTLET

There will be one (1) 2.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing will consist of 2.50" piping and flexible hose with a 2.50" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe will be used in the plumbing where appropriate. The piping will terminate with a 2.50" NST with 90 degree stainless steel swivel.

There will be automatic drains provided at all low points of the piping.

DISCHARGE OUTLET (REAR)

There will be Two (2) discharge outlets piped to the rear of the hose bed, Location will be one left and right side. Proper clearance will be provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. The discharge outlet(s) will terminate with a 2.50" male National Standard hose thread male adapter.

ADDITIONAL REAR OUTLET ELBOWS

The 2.50" discharge outlets, located at the rear of the apparatus, will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread chrome plated, 45 degree elbow.

The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.

FRONT OF HOSE BED DISCHARGE OUTLET

There will be Two (2) discharge outlets located at the front of the hose bed, on one (1) each side. Plumbing will consist of 2.00" piping with a 2.00" full-flow ball valve controlled at the pump operator's panel. The discharges will terminate with an 1.50" (M) NPSH adapter.

DISCHARGE CAPS/ INLET PLUGS

Chrome plated, rocker lug, caps with chain will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain will be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected.

OUTLET BLEEDER VALVE

A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails.

ADAPTER, STORZ

There will be one (1) adapter with 5.00" Storz x 2.50" MNST with cap, installed passenger side large diameter.

DELUGE RISER

A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel.

Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 16.7.5.3.

The deluge riser will have male National Pipe Threads for mounting the monitor.

CROSSLAY HOSE BEDS, 2.50"

Two (2) crosslays with 2.50" outlets will be provided. Each bed will be capable of carrying 200 feet of 2.50" double jacketed hose and will be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

The outlets will be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls will be at the pump operator's panel.

The center crosslay dividers will be fabricated of .25" aluminum and will provide adjustment from side to side. The divider will be unpainted with a brushed finish. The remainder of the crosslay bed will be painted job color.

Stainless steel vertical scuffplates will be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) will also be equipped with a stainless steel scuffplate.

Crosslay bed flooring will consist of removable perforated brushed aluminum.

CROSSLAY/DEADLAY HOSE RESTRAINT

Elastic netting will be provided across the top and ends of two (2) crosslay/deadlay opening(s) to secure the hose during travel. The netting will be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

CROSSLAY ROLLER

A stainless steel roller will be mounted horizontally and vertically at each crosslay opening to aid in hose removal. The vertical rollers will be installed on the dividers and to the front and rear of the crosslays.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel will be installed in the rear compartment.

The exterior finish of the reel will be painted #269 gray from the reel manufacturer.

Compartment floor will be covered with bright aluminum treadplate.

Roll-up door for this compartment will not interfere with the hose reel.

A polished stainless steel roller and guide assembly will be provided at the rear on each side so the booster hose does not rub against a painted surface.

Discharge control will be provided at the pump operator's panel. Plumbing to the reel will consist of 1.50" Aeroquip hose and a 1.50" valve.

HOSE REEL BLOWOUT

A hose reel blowout will be furnished to blow out any remaining water from the hose reel. The blowout will be piped from the wet tank of the brake system to the hose reel and will be controlled at the pump operator's panel.

Reel motor will be protected from overload with a circuit breaker rated to match the motor.

An electric rewind control switch will be installed adjacent to the reel.

Booster hose, 1.00" diameter and 200 feet, with chrome plated Barway, or equal couplings will be provided. The hose will be divided in to three separate lengths of (1) 100' section and (2) 50' sections.

Working pressure of the booster hose will be a minimum of 800 psi.

Capacity of the hose reel will be 200 feet of 1.00" booster hose.

HOSE REEL BLOWOUT

one (1) hose reel blowout(s) will be furnished to blow out any remaining water from the reel(s). The blowout will be piped from the wet tank of the brake system to the reel, and will be controlled at the pump operator's panel.

FOAM SYSTEM

An Akron, Model 3126, foam eductor, with a capacity for 125 gpm, will be installed on the discharge side of the pump. Foam eductor will have a ball-type check valve to prevent water flow back into the foam agent line. Foam eductor will have a quarter-turn ball valve, for alternation between the bypass and the eductor.

The foam system will be a single agent system capable of handling class A foam concentrates as well as most class B foam concentrates.

The foam eductor will be plumbed to the front crosslay discharge.

Controls for the foam system will be located on the pump operator's panel and labeled with red tags for easy identification. The controls for the eductor, foam supply, and the flush will be electric over pneumatic to allow for an ergonomically designed control panel and simplified operation.

Provided with the system will be an instruction plate and plumbing schematic.

Push/pull handles for the foam system will be labeled with red tags for easy identification.

All piping coming in direct contact with the foam concentrate will be immune to the concentrate, so deterioration of the plumbing will be avoided.

This system will have a bypass eductor type foam, with a rated capacity of 125 gpm at .25 percent .5 percent, 1 percent, 3 percent, and 6 percent.

Foam system operational considerations: 200 psi eductor inlet pressure will be required for proper operation.

FOAM TANK REFILL COVER

The foam tank dome cover will be hinged from the forward edge of the fill dome of the refill dome.

LABEL, FOAM CONTENT

A label will be provided on the foam tank fill dome. This label will be worded "Foam".

FOAM TANK

The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 30 gallons of foam with the intended use of Class B foam. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

The foam tank drain will be a 1.00" drain valve located inside the pump compartment accessible through a door on the right side pump panel.

The following drawing(s) will be provided for approval by the customer. The drawing(s) will be made to match 33960 similar Pierce job number.

PUMP OPERATOR'S PANEL DRAWING

A detailed drawing to scale of the pump operator's panel will be provided for the customer to review. The drawing will include all of the gauges, controls, switching, etc., located on the pump operator's panel. The customer will be allowed to make changes and/or mark-ups to this approval drawing. The fire apparatus manufacturer will make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved pump operator's panel drawing will become part of the contract documents.

Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will NOT be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.

REMAINING PUMP PANEL(S)

Detailed drawing(s) to scale of the remaining pump panel(s) will be provided for the customer to review. The drawing(s) will include all of the gauges, controls, switching, etc., located on the pump panel(s). The customer will be allowed to make changes and/or mark-ups to these approval drawing(s). The fire apparatus manufacturer will make revisions (If needed) to the drawing(s) per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved pump panel drawing(s) will become part of the contract documents.

Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will NOT be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.

COLOR CODED TAGS

A detailed drawing/chart of the colors used on all of the inlet(s) and outlet(s) will be provided for the customer to review. The customer will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved drawing/chart of the colors will become part of the contract documents.

SPECIAL TEXT/VERBIAGE TAGS

A detailed drawing/chart of the text/verbiage used on all of the inlet(s) and outlet(s) will be provided for the customer to review. The customer will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved drawing/chart of the text/verbiage will become part of the contract documents.

PUMP PANEL CONFIGURATION

The pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.

PUMP AND GAUGE PANEL

The pump and gauge panels will be constructed of stainless steel with a brushed finish. A polished aluminum trim molding will be provided on both sides of the pump panel.

PUMP ACCESS

Right Side Panel

The right side pump panel will be removable.

Panel Fastener

The right side removable panel will be secured using a chrome flush lift and turn latch .

The left side pump panels will be attached with screws.

The right side lower panel (drain bank) will be secured using screws.

Front Pump House Access

The front of the pump house structure will have provisions for access to the pump.

PUMP COMPARTMENT LIGHT

A pump compartment light will be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole will be provided in each light lens, preventing moisture retention.

PUMP PANEL GAUGES AND CONTROLS

The following will be provided on the pump and gauge panels in a neat and orderly fashion. These gauges will be in addition to what is provided with the pressure controller.

- Engine Oil Pressure Gauge: With visual and audible warning
- Engine Water Temperature Gauge: With visual and audible warning
- Tachometer: Electric
- Master Pump Drain Control
- Voltmeter
- Fuel

THROTTLE READY GREEN INDICATOR LIGHT

There will be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.

OK TO PUMP INDICATOR LIGHT

There will be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok To Pump mode.

PUMP ACCESS DOOR

A vertically hinged stainless steel door will be provided on the right side pump panel for access to same size as customer previous unit 35304 that had a compartment in this position. The door will be sized as large as possible.

TEST PORT

An electronic pump RPM test port will be provided.

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

The gauges will be a minimum of 6.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and polished stainless steel plugs. They will be marked with a label.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges will be interlube filled and manufactured by Class 1©.

The gauges will be a minimum of 3.50" in diameter and will have white faces with black lettering.

Gauges will be compound type with a vacuum/pressure range of 30.00"-0-600#.

The individual pressure gauge will be installed as close to the outlet control as practical.

WATER LEVEL GAUGE

There will be an Innovative Controls part number 3030385-01, 14-LED water level display provided on the pump operators gauge panel.

This water level display will indicate the following:

- Full with four (4) green horizontal LED lights on top.
- 3/4 full with three (3) amber horizontal LED lights in the second position from the top.
- 1/2 full with two (2) amber horizontal LED lights in the third position from the top.
- 1/4 full with one (1) amber LED light in the fourth position from the top.
- Empty with four (4) red horizontal LED lights in the bottom position.

FOAM LEVEL GAUGE

There will be an Innovative Controls part number 3030386-01B, 14-LED foam level display labeled for Class B foam provided on the pump operators gauge panel.

This foam level display will indicate the following:

- Full with four (4) green horizontal LED lights on top.
- 3/4 full with three (3) amber horizontal LED lights in the second position from the top.
- 1/2 full with two (2) amber horizontal LED lights in the third position from the top.
- 1/4 full with one (1) amber LED light in the fourth position from the top.
- Empty with four (4) red horizontal LED lights in the bottom position.

LIGHT SHIELD

There will be a polished, 16 gauge stainless steel light shield will be installed over the pump operators panel.

- There will be three (3) On Scene Solutions Night Axe, Model 70005, 18.00" LED lights installed under the stainless steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be

activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.

- One (1) pump panel light will come on when the pump is in ok to pump mode.

There will be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.

AIR HORN SYSTEM

There will be two (2) Grover air horns recessed in the front bumper. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

Air Horn Location

The air horns will be located on each side of the bumper, just outside of the frame rails.

AIR HORN CONTROL

The air horn(s) will be activated by the following:

- Left side foot switch
- Right side foot switch

AUXILIARY MECHANICAL SIREN

There will be a Federal Signal Model Q2B mechanical siren furnished and installed in the front of the apparatus.

The Q2B will be chrome finish.

The siren will have a 2-gauge cable connected to a power solenoid that is connected by a 2-gauge cable ran battery direct to the primary chassis batteries and will be labeled Q2B+ at the battery. The power solenoid will only be enabled when the emergency master switch is on.

The siren will have a 2-gauge ground wire connected to the chassis battery stud. The cable will be labeled Q2B- at the battery.

When the chassis battery switch is on, and the emergency master switch is on, the Q2B siren will be activated by the following:

The mechanical siren will be mounted on the bumper deck plate. It will be mounted on the left side. A reinforcement plate will be furnished to support the siren.

MECHANICAL SIREN CONTROL

The mechanical siren will be activated by the following:

- Steering wheel horn ring with horn/siren selector switch.
- Right side foot switch.

A momentary red switch will be included in the left side overhead switch panel to activate the siren brake.

GROUND STRAP FROM Q2B TO GROUND STUD

A ground wire will be added to the Q2B siren. The ground wire will run from the siren motor to the ground stud below the bumper deckplate.

ACTIVATION FOR WARNING LIGHTS INTENSITY

When parking brake is released, the designated Whelen® warning lights on the cab and the warning lights on the body will transition to a low power intensity. The flash pattern will not be affected.

In order for the activation of low power mode of the warning lights, the battery switch, the ignition switch, the emergency master switch, must be on, and the parking brake released.

The low power intensity mode will be reset when any of the above conditions are not met.

FRONT ZONE UPPER WARNING LIGHTS

There will be a 92.00" Whelen® Freedom™ IV lightbar mounted on the cab roof.

The lightbar will include the following:

- One (1) red flashing LED module in the left side end position.
- One (1) red flashing LED module in the left side front corner position.
- One (1) red flashing LED module in the left side first front position.
- Open in the left side second front position.
- One (1) white flashing LED module in the left side third front position.
- One (1) red flashing LED module in the left side fourth front position.
- Open in the left side fifth front position.
- One (1) red flashing LED module in the left side sixth front position.
- One (1) white flashing LED module in the left side seventh front position.
- One (1) 795 LED traffic light controller set to national standard high priority in the left side center front positions.
- One (1) white flashing LED module in the right side seventh front position.
- One (1) red flashing LED module in the right side sixth front position.
- Open in the right side fifth front position.
- One (1) red flashing LED module in the right side fourth front position.
- One (1) white flashing LED module in the right side third front position.
- Open in the right side second front position.
- One (1) red flashing LED module in the right side first front position.
- One (1) red flashing LED module in the right side front corner position.
- One (1) red flashing LED module in the right side end position.

There will be clear lenses included on the lightbar.

The following switches may be installed in the cab on the switch panel to control the lightbar:

- a switch to control the flashing LED modules
- the traffic light controller will be by a cab switch with emergency master control
- there will be no momentary switch to activate the traffic light controller

The white flashing LEDs and the traffic light controller will be disabled when the parking brake is applied.

The six (6) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

CAB FACE WARNING LIGHTS

There will be four (4) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning lights installed on the cab face, above the headlights in a housing that matches the headlights per the following:

- The left side outside warning light to include red LEDs.
- The left side inside warning light to include white LEDs.
- The right side inside warning light to include white LEDs.
- The right side outside warning light to include red LEDs.
- The warning light lens colors to be the same as the LEDs.
- The housing to be polished and the trim shall be chrome.

The lights will be controlled per the following:

- A switch in the cab, on the switch panel will control the lights.
- White LEDs will be deactivated when the parking brake is applied.
- Amber LEDs will be deactivated when the parking brake is released.
- Amber, blue, green or red LEDs in the inside positions may be load managed when the parking brake is applied.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side.

There will be a switch installed in the cab on the switch panel to control the high beam flash. This switch will be live when the battery switch and the emergency master switches are on.

The flashing will automatically cancel when the headlight (high or low beam) switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

There will be six (6) Whelen®, Model M6**, 4.31" high x 6.75" long x 1.37" deep flashing LED warning lights with chrome trim installed per the following:

- Two (2) lights located, one (1) each side on the bumper extension. The driver's side, side front light to include red warning LEDs and the passenger's side, side front light to include red warning LEDs.

- Two (2) lights located, one (1) each side of cab rearward of crew cab doors. The driver's side, side middle light to include blue warning LEDs and the passenger's side, side middle light to include blue warning LEDs.
- Two (2) lights located, one (1) each side above rear wheels. The driver's side, side rear light to include red warning LEDs and the passenger's side, side rear light to include red warning LEDs.
- The warning light lens colors to be the same as the LEDs.

There will be a switch in the cab on the switch panel to control the lights.

SIDE WARNING LIGHTS

There will be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided on the cab corner(s) per the following:

The light(s) to include red flashing LEDs and the lens color(s) to be the same as the LEDs.

The light(s) will be mounted on a 45 degree angled polished stainless steel bracket(s).

The light(s) may be controlled with the side warning switch.

- White LEDs will be deactivated when the parking brake is applied
- Amber LEDs will be activated when the parking brake is applied
- Amber, blue or red LEDs may be load managed when the parking brake is applied

REAR ZONE LOWER LIGHTING

There will be two (2) Whelen®, Model M6* LED flashing warning lights with chrome trim located at the rear of the apparatus.

- The driver's side rear light to be red
- The passenger's side rear light to be blue

The lens color(s) to be the same as the LEDs.

There will be a switch located in the cab on the switch panel to control the lights.

The light(s) will have the low intensity mode wire connected to the controlling circuit.

REAR OF HOSEBED WARNING LIGHTS

There will be two (2) Whelen, Model B6M7**1P Super LED beacon with lower LED flashing warning lights provided at the rear of the truck, one (1) each side.

Each light will include a Super LED flashing beacon and a Whelen, Model M7* LED flashing light, mounted in a polished aluminum housing.

The beacons will have red LEDs and be provided with both domes red.

The color of the Whelen, Model M7* LED flashing lights will be amber and include a lens that is the same color as the LED's .

A switch will be provided in the cab, on the switch panel to control the beacons. The lower Whelen, M7* LED lights will be activated with the rear upper warning switch.

The rear warning lights will be mounted on stainless steel brackets with all wiring totally enclosed. These brackets will also support the clearance/marker lights.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen® Model TAL85 46.87" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The lens color will be the same color as the LED's.

The control head will be included with this installation. The control head will be energized when the battery switch is on.

The auxiliary flash not activated.

This traffic directing light will be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical.

The traffic directing light controller will be located within the overhead recessed console above the engine tunnel on the driver's side.

CUP HOLDER

A cup holder will be provided for the Two (2) to securely hold the push-up pole in place while in the lower position.

POWER OUTLET STRIP

There will be one (1) receptacle strip(s) with six (6) 15 amp 120 volt AC straight blade receptacles provided 120 volt receptacle that the power stripe plugs into will be located behind the drive seat recessed in side wall, power stripe will be ran thru the crew cab floor rear od engine tunnel and coiled loose with final install by the Customer - see photo.

The strip(s) selected will be powered from the shoreline inlet through a receptacle located adjacent to the strip(s).

There will be a label installed near the strip(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9.3 and 5.9.4 will be provided by the fire department.

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) smoothbore or combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.
- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads.
- One (1) rubber mallet, for use on suction hose connections.
- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, will be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side will be carried. Any intake connection larger than 3.00" (75 mm) will include a pressure relief device that meets the requirements of 16.6.6.

- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake will be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters will be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.8.2.1 requires a minimum of 20' of suction hose or 15' of supply hose will be carried.

Hose is not on the apparatus as manufactured. The fire department will provide suction or supply hose.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

The axe is not on the apparatus as manufactured. The fire department will provide and mount the axe.

PAINT

The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior

surfaces that will not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.

2. Chemical Cleaning and Pretreatment - All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion.
3. Surfacer Primer - The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
4. Finish Sanding - The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when topcoated.
6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
7. Clear Coat - Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.

After the cab and body are painted, the color will be verified to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications will be used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim will be removed and painted separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.

The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T. standard in critical areas. These requirements must be met in order for the exterior paint finish to be considered acceptable. The manufacture's written paint standards will be available upon request.

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers will be recycled to recover the metal.
- Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

CAB PAINT

The cab will be painted #20 white.

BODY PAINT

The body will be painted to match the lower section of the cab.

GALVANIZED CHASSIS FRAME ASSEMBLY

The chassis frame assembly will be hot dip galvanized before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

Components that are included with the chassis frame assembly that will be hot dip galvanized are:

- Frame rails
- Cross members
- Front frame extension

All galvanized components are inspected for compliance with ASTM specifications.

Battery boxes will be stainless steel.

All components that are not galvanized will be painted primer and gloss black paint.

AXLE HUB PAINT

All axle hubs will be painted to match primary job color.

HOT DIP GALVANIZED WATER TANK CRADLE

The water tank cradle will be treated through a hot dip galvanizing process. The cradle will be immersed in molten zinc to provide a coating that will help protect against the effects of corrosion.

COMPARTMENT INTERIOR PAINT

The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE STRIPES

Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" black stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" black stripe on the bottom.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

REAR CHEVRON STRIPING

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

The colors will be red and fluorescent yellow green diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body will contain one (1) jog(s) and will be angled at approximately a 45 degrees when installed.

OUTLINE, REFLECTIVE STRIPE

A Black outline will be applied on the top and the bottom of the reflective band. There will be one (1) set of outline stripes required.

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be black

The second color will be gold

The size of the striping will be 4.00".

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 3.00" high, with outline will be provided.

LETTERING, SCRIPT

Script lettering will be provided on the rear body compartment door. The lettering will state "Everyone Comes Home".

EMBLEMS

There will be two (2) monogram emblem(s) installed on the front cab doors, with "DENVER" above the monogram and "FIRE DEPT." below the monogram.

The monogram and lettering will be made of gold reflective material with black outline.

The design will be the same as on previous units.

EMBLEMS

There will be a pair of American flag emblems, installed on the rear crew cab windows. The emblem will be waving and made out of Gerber Vision material.

EMBLEM

There will be one (1) emblem(s), approximately 24.00" - 25.00" wide in size, installed R1. The emblem will feature a "Flying American Flag" and an "Eagle Head".

OVAL STRAPPING HERON RIB

one (1) roll (s) shall be provided and shipped loose with the truck for the department to install. The color will be red.

FLUID ANALYSIS

Fluid sample analysis of the engine oil, the transmission fluid, and the cooling system will be provided. Written results of these tests will be provided to DFD Fleet Management.

CHASSIS SERVICE

Chassis service will be done when the apparatus arrives at the dealer location, but before delivery to the customer.

Service will include:

- Engine Oil and filter change
- Fuel filter change
- Grease drivelines
- Check and fill all fluids.

MONITOR (shipped loose)

An Akron #3423 Deluge with ground base, pipe and tips, #5160 Nozzle, #3505 Mounting Bracket, #3501 Direct mount Cover will be supplied.

MANUALS CHASSIS ENGINE

Engine trouble shoot and parts manuals will be provided.

MANUALS, CHASSIS TRANSMISSION

Transmission service and parts manuals will be provided.

INTERCOM SYSTEM (shipped loose)

- Four (4) Remote Headset Station Model U3802
- One (1) Master Station Model U3800
- Four (4) Remote Interface Module PTT Model U3811
- Five (5) Headset Behind-The -Head Model H3342
- 25 Feet of 6 Conductor Wire
- 25 Feet of 4 Conductor Wire
- One (1) Power Cord (For U3800) Model C3820
- Five (5) Remote Jumper Cord 12Ft Model C38-12
- Two (2) Remote Jumper Cord 25Ft Model C38-25
- Six (6) Connector Kit 6 pin
- Two (2) Connector Kit 4 pin
- Two (2) Radio Interface Cords C3821

INSPECTION TRIP #3

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a delivery inspection.

INSPECTION TRIP #2

An inspection trip will be provided for two (2) people. Trip will take place at the factory for a post paint inspection.

INSPECTION TRIP #1

An inspection trip will be provided for two (2) people. Trip will take place at the customer location for a preconstruction conference.

MANUAL, FIRE APPARATUS PARTS

Two (2) custom parts manuals for the complete fire apparatus will be provided in hard copy with the completed unit.

One (1) compact disc (CD) will also be provided that will include all of the information from the above manual.

The manual will contain the following:

- Job number

- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

The manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

MANUALS, CHASSIS SERVICE

Two (2) chassis service manuals containing parts and service information on major components will be provided with the completed unit.

The manuals will contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

MANUALS, CHASSIS OPERATION

Two (2) chassis operation manuals will be provided.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

A Pierce basic apparatus limited warranty certificate, WA0008, is included with this document.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Pierce custom chassis limited warranty certificate, WA0284, is included with this document.

ENGINE WARRANTY

A Cummins **five (5) year** limited engine warranty will be provided. A limited warranty certificate, WA0181, is included with this document.

STEERING GEAR WARRANTY

A Sheppard **three (3) year** limited steering gear warranty will be provided. A copy of the warranty certificate will be submitted with the bid package.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

The Pierce custom chassis frame and crossmembers limited warranty certificate, WA0038, is included with this document.

FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

The Pierce TAK-4 suspension limited warranty certificate, WA0050, is included with this document.

SINGLE REAR AXLE FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor™ Axle 5 year limited warranty will be provided.

ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor Wabco™ ABS brake system limited warranty certificate, WA0232, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce custom cab limited warranty certificate, WA0012, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce cab limited pro-rated paint warranty certificate, WA0055, is included with this document.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The Pierce Command Zone electronics limited warranty certificate, WA0014, is included with this document.

CAMERA SYSTEM WARRANTY

A Pierce fifty four (54) month warranty will be provided for the camera system.

COMPARTMENT LIGHT WARRANTY

The compartment lights will not offer an extended warranty.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

TRANSMISSION COOLER WARRANTY

The transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

WATER TANK WARRANTY

A UPF poly water tank limited warranty certificate, WA0195, is included with this document.

TEN (10) YEAR STRUCTURAL INTEGRITY

The Pierce apparatus body limited warranty certificate, WA0009, is included with this document.

PUMP WARRANTY

The Waterous pump will be provided with a Seven (7) year material and workmanship limited warranty.

A copy of the warranty certificate will be submitted with the bid package (no exception).

TEN (10) YEAR PUMP PLUMBING WARRANTY

The Pierce apparatus plumbing limited warranty certificate, WA0035, is included with this document.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A Pierce body limited pro-rated paint warranty certificate, WA0057, is included with this document.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

The Pierce graphics fading and deterioration limited warranty limited warranty certificate, WA0168, is included with this document.

VEHICLE STABILITY CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification will be provided at the time of bid.

ENGINE INSTALLATION CERTIFICATION

The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification will be provided at the time of delivery.

POWER STEERING CERTIFICATION

The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification will be provided at the time of bid.

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer will provide a cab integrity certification with this document. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Roof Crush

The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

Frontal Impact

The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

Additional Frontal Impact

The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420).

The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles*. The bidder will certify that the wiper system design has been tested and that the wiper system has met these criteria.

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

PERFORMANCE CERTIFICATIONS

Cab Air Conditioning

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder will certify that a substantially similar cab has been tested and has met these criteria.

Cab Defroster

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

Cab Auxiliary Heater

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which will include the following:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - The minimum continuous load of each component that is specified per:
 - Applicable NFPA 1901 or 1906 (Current Edition).
 - Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - Each individual intermittent load.

All of the above listed items will be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

