Municipality of East Ferris

Report to Council

Report No.: FD-2025-03 Date: May 13, 2025

Originator: Steph Amyotte, Fire Chief

Subject: Fire Truck Purchase

RECOMMENDATION

THAT Council of the Corporation of the Municipality of East Ferris authorize staff to enter into an agreement with Battleshield Industries Limited for the design and purchase of a new 2025 pumper truck in the amount of $736,715.00 plus HST as per specifications listed in Appendix A.

BACKGROUND

At the regular meeting of Council held on April 22nd, 2025, Council passed Resolution 2025-106:

THAT Council for the Municipality of East Ferris accepts the recommendation of the Fire Chief in Report No. FIRE-2025-02 and authorizes staff to negotiate a purchase agreement with Battleshield Industries Limited for the design and purchase of a new pumper truck;

AND THAT Council requests that staff return to Council for approval of the agreement and purchase price.

The design of the new pumper truck is complete and meets both the requirements of NFPA 1901 and the specific needs of East Ferris Fire and Emergency Services. NFPA 1901 is the standard for automotive fire apparatus that provides guidelines for the design and construction of these vehicles. The pumper truck specifications for this unit are listed in Appendix A to this report.

If Council accepts the recommendation contained in this report, staff will give approval to Battleshield Industries Limited to proceed with the build and as per discussion with the manufacturer, delivery of the truck is expected by mid December 2025.

FINANCIAL IMPLICATIONS

The purchase price is $736,715.00 plus HST. Our cost net of HST rebate is $749,681.18. We expect to receive approximately $120,000.00 salvage value for our current unit resulting in a net cost of approximately $630,000.00.

There is no deposit required to secure a build spot with Battleshield. The entire cost is due upon delivery.

The Treasurer is working on securing financing for the purchase. The Municipality will cashflow the purchase until financing is secured. With the delivery and payment not occurring until mid-December, the first loan payment would not be due until 2026; therefore, there are no loan

payments due in 2025 and no financial impact on our 2025 budget. Loan payments will need to be included in the annual budget beginning with the 2026 budget.

OPTIONS

Option 1: Single Source Purchase of a Pumper Truck from Battleshield Industries Limited

Single source design and purchase of a new 2025 pumper truck from Battleshield Industries Limited in the amount of $736,715.00 plus HST as per specifications listed in Appendix A.

Option 2: Proceed with Request for Proposal

Staff proceed with a Request for Proposal (RFP) for a new pumper truck as authorized in Resolution 2025-90.

Respectfully Submitted,

Steph Amyotte
Fire Chief

I concur with this report and recommendation.

Jason H. Trottier, HBBA, MPA, CPA, CMA
CAO/Treasurer

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	GENERAL			
1.	**CERTIFICATIONS**			
1.1.	The Vehicle supplied shall meet or exceed the requirements of the following standards and requirements: • Ministry of Transportation of Ontario standards as set out in the "*Highway Traffic Act* and Regulations". • The latest applicable S.A.E. (Society of Automotive Engineers) and UL (Underwriter Laboratory) standards and regulations. • O.S.H.A. (Occupational Safety and Health Administration) recommended practices. • The Ontario *Occupational Health and Safety Act* (OHSA). The vehicle shall meet all requirements of U.L.C. S515 M88 for Firefighting apparatus, Canadian Motor Vehicle safety standards (latest Edition), Canadian Standards Association C.S.A. C225-176, Society of Automotive Engineers S.A.E J343C-1975, American National Standards Institute ANSI, and Occupational Safety and Health Acts including all amendments, Welding Bureau of Canada CWB W59- 1989 W59 2-M1991 W47.1 S-M1989 W47.2 M-1987 (including all amendments), Ontario Highway Traffic Act, NFPA 1901- Most Current Edition (where indicated). All other applicable regulations pertaining to the supply and intended use of the equipment stated. The specified Vehicle(s) and/or equipment must comply with all requirements of the Canada *Motor Vehicle Safety Act* and its regulations (See CMVSS section below).			
2.	**CERTIFICATIONS – CANADA MOTOR VEHICLE(S) SAFETY STANDARD (CMVSS)** – See item above			
2.1.	The specified Vehicle(s) (Apparatus) and Equipment must comply with all requirements of the Canada *Motor Vehicle(s) Safety Act* (CMVSS) and its regulations including, but not limited to: a) A compliance label on each Vehicle(s) (Apparatus) containing all required information including, but not limited to: • Gross Vehicle(s) axle ratings for each axle, which shall not be less than the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces. • Gross Vehicle(s) weight ratings, which shall not be less than the loaded weight of a single			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	completed Vehicle. • Complete Vehicle(s) apparatus documents with the required information from all stages of manufacture; and, • All information labels from all stages of manufacture.			
2.2.	The specified vehicle (apparatus) and equipment must comply with all requirements of the National Fire protection Association (NFPA) standard – Standard for Automotive Fire Apparatus – Most current edition.			
3.	**NATIONAL SAFETY MARK (NSM)**			
3.1.	The company involved in the initial, intermediate, and final stages of manufacture of the Vehicle(s) shall be authorized by the Minister and have a "National Safety Mark" and a compliance label prior to the delivery of the completed Vehicle(s). The compliance label on each Vehicle containing all required information including, but not limited to: • Requirement(s) related to the National Safety Mark (NSM). • Gross vehicle axle ratings for each axle, which shall not be less than the load- carrying capacity.			
3.2.	The final stage Manufacturer must be authorized by Transport Canada to apply the NSM label.			
4.	**PARTS AND SERVICE MANUALS**			
4.1.	One (1) operators' manual, in English, plus one (1) electronic file (USB drive) are required covering the operation and parts of the complete vehicle shall be provided with the unit on delivery.			
4.2.	Manufacturer's warranty literature should be provided with the bid submission.			
4.3.	One (1) complete hard copy 11" X 17" plus one (1) electronic file (USB drive) as-built wiring diagrams for the complete vehicle are required at delivery. Wiring diagrams must be in accordance with NFPA regulations. Wiring diagrams should identify the color and numbering on the wiring.			
4.4.	One (1) chassis maintenance manual containing service information shall be provided with the unit on delivery.			
5.	**CONTACT INFORMATION FOR SERVICE FACILITY**			
5.1.	The service facility shall be a 24/7 service center where a technician can be reach at any time or day for support or service call.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
5.2.	For warranty repairs, the facilities, or portions thereof, as identified, shall be dedicated to the service and maintenance of the type of Vehicle(s) and/or equipment being offered. The Municipality reserves the right at any time prior to the contract award and/or during the contract period, to inspect the Contractor's, Service Provider's and/or Subcontractor's Service Facilities identified. The Municipality shall provide twenty-four (24) hours prior notice for an inspection. The Municipality shall verify that the Contractor's premises are deemed to have reasonable levels of trained personnel, documentation, licensing, and equipment relevant to the work being maintained to meet the requirements of the contract.			
5.3.	The service provider shall have an EVT certified technician on staff.			
5.4.	The service provider shall have 310T license mechanic on staff.			
5.5.	The service provider shall have a certified Waterous pump technician on staff.			
5.6.	The service provider shall have a mobile pump testing unit.			
6.	**DECALS/SIGNAGE**			
6.1.	Vehicle signage shall be bilingual (English/French) or universal symbol (use of graphic symbols as defined in SAE 1362 is acceptable), where applicable.			
7.	**GENERAL WARRANTY**			
7.1.	The warranty shall cover the complete vehicle, 100% parts and labor for the first two (2) years.			
7.2.	For clarification purposes, minor warranty repairs will include, but not be limited to; bulb, belt, and hose replacements etc.			
7.3.	The warranty will be based on years and shall include all ancillary equipment included and installed on the unit upon acceptance by the Municipality.			
7.4.	The intent of the wording of the minimum warranties referenced in the respective sections shall include all parts and labour on the complete component for the duration specified. For example: Engine shall include all ancillary attachments to the engine such as wiring harnesses, alternators, injectors, injection pumps, etc. The complete engine, not just the internal components of the engine.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	This would not include oil filters, belts, tires, brake pads.			
7.5.	In the event of a dispute between the Municipality and the manufacturer concerning the component in question, the component shall be forwarded to the Original Equipment Manufacturer for determination of failure. Should it be deemed to have failed because of negligence or abuse, the cost of the component will be borne by the Municipality, otherwise the cost will be borne by the Contractor. This would apply to all ancillary attachments to all components as referenced.			
8.	**WARRANTY AUTHORIZATION AND RESPONSIBILITY**			
8.1.	If the vehicle becomes immobile during the warranty period due to the failure of a warrantable component, the Contractor shall be responsible for the towing and/or float charges to transport the vehicle to the Contractor's facility and the Contractor shall return the vehicle to the Municipality facility all at the Contractor's sole expense, risk and responsibility.			
8.2.	Where applicable, if the manufacturer provides a longer warranty period or a warranty that is more extensive in its nature, then the provisions of such a manufacturer's warranty shall apply.			
8.3.	The warranty period shall commence from the "Delivery Day date" which is the date that the vehicle/material is delivered to the Municipality and received by the Municipality authority.			
8.4.	The labour for the removal or installation of warranted parts, or components and any associated shipping fees will be the sole responsibility of the contractor.			
9.	**SPECIFICATIONS OVERVIEW**			
9.1.	The vehicle and its components shall be designed to operate in Canadian climate weather conditions (-40 to +40 degrees Celsius.) As winter conditions are very corrosive from the use of salt preventive measures shall be incorporated in its design and equipment to address the problem of corrosion and galvanic reaction.			
9.2.	In the event of a conflict between the text of this document and the references cited herein, the text of the document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been indicated.			
9.3.	Any error or omission in the specifications shall be immediately reported to the purchaser for correction.			
9.4.	Where these specifications list only the major significant			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	details of the units(s) or equipment required, it is the bidder's responsibility to provide a unit or the equipment fully equipped for its intended use, to provide dependable and efficient service and performance.			
9.5.	The Supplier shall assume complete and overall responsibility for design, implementation of design and satisfactory operation for the completely new vehicle/equipment that meet this specification and its sub-systems.			
9.6.	The municipality shall be responsible for all costs of meetings and inspections at the manufacturer's location. There will be three (3) members of the fire department present for each meeting or inspection required. A minimum of five (5) business day's notification is required prior to each inspection. All meetings to be scheduled during the afternoon, between the hours of 1:00pm to 4:00pm. 1. Factory pre-construction meeting and facilities tour 2. Chassis inspection 3. Pre-paint inspection 4. Factory final inspection* Factory meetings and inspections denote the location where the apparatus is built, and not at the dealer location the apparatus is delivered to prior to final delivery to the fire department. This is required to ensure that all requirements, changes, and other items deemed necessary by the fire department are carried out in the quickest fashion causing minimum delays.			
9.7.	Concurrence by the Bidder to any specification requirement contained within this Request for Tender shall take precedence over any documentation accompanying the bid submission.			
10.	**INSURANCE**			
10.1.	The Contractor shall provide and maintain during the term of the contract Garage Automobile Liability to include: • Section 1 Third Party Liability - subject to limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use. • Section 2 Accident Benefits – to be included as per Statutory Limits. • Section 3 Uninsured Automobile Coverage – To be included. • Section 6 Liability for Damage to a Customer's Automobile while in the Care, Custody or Control of the Insured.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	• Section 6.1 Collision or Upset Limit applicable to any one customer's automobile - $750,000. • OEF #77 Comprehensive coverage subject to limits of not less than $1,000,000. • OEF #81 Garage Family Protection Endorsement.			
10.2.	The liability insurance policies shall contain endorsement to provide the Municipality with coverage. Notification of cancellation must be made thirty (30) days prior in writing.			
11.	**GENERAL, CONSTRUCTION AND DESIGN**			
11.1.	The Bidder confirms and guarantees the apparatus delivered will be of the highest engineering standard and as such confirms and guarantees that the apparatus will be able to maintain their readability as per the NFPA 1901 Most Current Edition regulations in all emergency conditions over their projected twenty (20) year life span.			
11.2.	The design of the equipment shall be in accordance with the best engineering practices. The equipment design and accessory installation shall permit accessibility for use, maintenance, and service. All components and assemblies shall be free of hazardous protrusions, sharp edges, cracks, or other elements, which might cause injury to personnel or equipment.			
11.3.	The Bidder confirms that the Vehicle Stability (of the apparatus being built) meets all NFPA 1901 Most Current Edition Regulations.			
11.4.	All oil, hydraulic, and air tubing lines and electrical wiring shall be installed in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through-frame connector is necessary.			
11.5.	Parts and components should be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.			
11.6.	Cover plates, which must be removed for component adjustment or part removal, should be equipped with quick-disconnect fastening or hinged panels.			
11.7.	Drains, filler plugs, grease fittings, hydraulic lines, bleeders, and check points for all components should			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	be located so that they are readily accessible and do not require special tools for proper servicing. Design practices should minimize the number of tools required for maintenance.			
11.8.	All custom manufacturers must have the ability to shear/cut, brake and weld, to meet specifications required, to meet design requirements.			
11.9.	Materials shall conform to the specifications listed herein. When not specifically listed, materials shall be of the best quality for the purpose of commercial practice. Materials shall be free of all defects and imperfections that might affect the serviceability of the finished product.			
11.10.	All nameplates and instruction plates shall have the information engraved, stamped, etched thereon. Nameplates shall show make, model, serial numbers, and other such data necessary to positively identify the item and all fluid levels for the vehicle. All nameplates shall be mounted in a conspicuous place; all warning and caution labels will be bilingual (English and French).			
11.11.	The manufacturing process, including quality control, shall be consistent with present industry standards. All equipment, material, and articles required under this specification are to be new or fabricated from new materials produced from recovered materials. The term "Recovered Materials" means materials, which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this document. The term "Heavy Duty", as used to describe an item, shall mean more than the standard, quantity, quality, or capacity and represents the best, most durable, strongest, etc., part, component, system, etc., that is available. The Municipality or their designation shall be the sole judge of quality, construction and stability of the apparatus and equipment being offered.			
11.12.	Parts, equipment, and assemblies, which have been repaired or modified to overcome deficiencies, shall not be furnished without the approval of the purchaser. Welded, and bolted, construction shall be utilized in accordance with the highest standards of the industry. (NO POP RIVETS). Component parts and units shall be manufactured with proper fits, clearances, and uniformity. The vehicle shall not show any evidence of poor quality of work.			
11.13.	Unless protected against electrolytic corrosion,			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	dissimilar metals shall not be used in intimate contact with each other.			
11.14.	The engine and transmission manufacturer's approval of the proposed installation including a performance SCAAN.			
11.15.	The height of the fully loaded vehicle's center of gravity shall not exceed the chassis manufacturer's maximum limit and shall be identified on submitted drawings.			
11.16.	The front and rear weight distribution of the fully loaded vehicle as defined shall be within the limits set by the chassis manufacturer. The front axle loads shall not be less than the minimum axle loads specified by the chassis manufacturer, under full load and all other loading conditions. The actual loaded weight on any axle shall not exceed the maximum allowable in the Province of Ontario.			
12.	**DELIVERY**			
12.1.	Acceptance of the delivered apparatus and equipment will be made upon satisfactory completion of all required tests, receipt of all specified equipment and documentation and commissioning unit into service.			
12.2.	The following items shall be furnished upon delivery of the vehicle: • Certification that the optical warning system has been supplied and installed in compliance with NFPA 1901- Most Current edition • A weight ticket from a certified scale showing the loading on the front axle, rear axle, and overall vehicle with water tank full but without hose, equipment or personnel • ULC or UL certification of the fire pump. No exceptions. • Tested and certified in accordance with Sections 12.13, 15.13, and 20.16.5 of CAN/ULC-S515-13. • Certification of the water tank capacity			
12.3.	An electrical load report on the proposed apparatus showing all electrical loads in the response and on-scene modes.			
12.4.	Apparatus shall be supplied with the E.S.A (Electrical Safety Code) certifications and inspections if build design warrants and inspection (120 Volt system).			
12.5.	Chassis line specifications ticket shall be supplied.			
13.	**TRAINING**			
13.1.	The delivery shall include four (4) hours of apparatus			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	familiarization, at minimum. It shall include vehicle familiarization and operational items only, as requested by the fire department. Topics to be discussed shall be provided by the Township with a minimum of two (2) weeks in advance to allow proper time to create a custom training session. The trainer shall be a body OEM supervisor familiar with all aspects of the apparatus construction. Under no circumstances will firefighting operations, tactics, and procedures be discussed as these are not relevant to fire apparatus manufacturing. The familiarization sessions shall be conducted in groups of four (4) firefighters.			
	CHASSIS			
14.	**VEHICLE PERFORMANCE**			
14.1.	The apparatus is expected to operate at elevations less than 2000 ft. (610 m) above sea level. The contractor shall ensure the apparatus will meet all requirements at the maximum specified elevation.			
14.2.	The apparatus, when fully equipped and loaded, shall be capable of the following performance on dry, level, paved roads in good condition: • From a standing start the vehicle shall attain a true speed of 55 km/h (35 mph) within 25 sec on a 0 percent grade. • From a steady speed of 24 km/h (15 mph) the vehicle shall accelerate to a true speed of 56 km/h (35 mph) within 30 sec. This shall be accomplished without moving gear selector. • The vehicle shall attain a maximum top speed of 105 km/h (65 mph). • The apparatus fully loaded shall be able to maintain a speed of at least 32 km/h (20 mph) on a 6 percent grade. • The service brakes shall be capable of bringing the fully loaded apparatus to a complete stop from a speed of 32 km/h (20 mph) in a distance not exceeding 10.7 m (35 ft.).			
14.3.	The sound level within the cab shall not exceed 85 dba with the vehicle travelling at a steady speed with no audible warning devices sounding as regulated by the Ontario workplace's health and safety act.			
14.4.	The parking brakes shall be capable of positively holding the fully loaded apparatus on a 20% grade.			
14.5.	The minimum angle of approach and departure shall not be less than 11 degrees.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
15.	**CHASSIS SPECIFICATIONS**			
15.1.	The cab and chassis shall be model 2025 or newer.			
15.2.	It shall be a M2 106 DC (2) door chassis.			
15.3.	The cab and chassis shall meet or exceed all requirements of U.L. or U.L.C., NFPA and other applicable Canadian and Ontario standards.			
15.4.	It shall have a front set back axle.			
15.5.	The wheelbase shall not exceed 211”.			
15.6.	The maximum length of the apparatus shall not exceed 382”.			
15.7.	The maximum overall height of the apparatus shall not exceed 119” inches from the ground to the highest point on the apparatus body.			
15.8.	The total front axle G.A.W.R. shall be a minimum of 18,000 lbs.			
15.9.	The total rear axles G.A.W.R. shall be a minimum of 31,000 lbs.			
15.10.	The total chassis G.V.W.R. shall be a minimum of 49,000 lbs.			
15.11.	The G.A.W.R. and G.V.W.R. of the chassis and all related components shall exceed the weight of the fully equipped apparatus by approximately 10%, including the fully loaded water tank, the specified hose load and equipment, and unequipped personnel weight.			
15.12.	A final manufacturer’s certification of the G.V.W.R., along with a certification of the G.A.W.R., shall be supplied on a nameplate affixed to the vehicle.			
15.13.	The difference in weight on the end of each axle, from side to side, when the vehicle is fully loaded and equipped shall not exceed 5 percent.			
15.14.	The actual loaded weight of the vehicle shall not exceed 90% of the G.V.W.R of the front and rear axle ratings.			
16.	**FRAME – BUMPER**			
16.1.	The frame shall be channel type, of sufficient dimension to handle the rigors of emergency service. The frames rails shall be one (1) continuous piece with no splices and for all purposes are considered a part of the frame/chassis system along with the cross members and shall not be cut, pierced, modified or weakened in any way.			
16.2.	The top frame rails shall be clear from all bolt heads or obstructions. The outside frame rails rear of the cab shall be clear of			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	any obstructions (air, fuel tanks etc.).			
16.3.	The bumper shall be a painted black three (3) piece steel front bumper and bolted directly to frame rails.			
16.4.	The front bumper shall be extended 22 inches ahead of the cab.			
16.5.	The front bumper extension shall be fitted with lighted guide bars mounted to the front face of the bumper at the corners.			
16.6.	Two (2) heavy duty painted tow hooks or eyes shall be installed under the front bumper. Tow hooks or eyes shall be bolted directly to chassis frame members.			
17.	**AXLES AND SUSPENSION**			
17.1.	Flat leaf front suspension.			
17.2.	The front axle shall be designed with a minimum of 18,000 lbs. G.A.W.R capacity. It shall be a Detroit DA-F-18.0-5.			
17.3.	Front springs shall meet or exceed the minimum 18,000 lbs. capacity of the front axle.			
17.4.	It shall be equipped with oil lubricated front wheel bearings with visual oil level indicators.			
17.5.	The rear axle shall be single axle with a minimum of 31,000 lbs. capacity G.A.W.R and shall include single reduction and oil lubricated rear wheel bearings. It shall be an RS-46-160 U-Series Fire/Emergency Service single axle.			
17.6.	The rear axle ratio shall be 5.38, capable of reaching top speed as required by N.F.P.A. 1901- Most Current edition.			
17.7.	Rear suspension capacity shall be designed to match or exceed the rated axle loading of the vehicle complete with heavy-duty shock absorbers. It shall be equipped with 31,000lbs flat leaf spring rear suspension with helper and radius rod for fire/emergency service.			
17.8.	Brake dust shields shall be installed on the front and rear axles.			
17.9.	There shall be a driver controlled differential lock rear valve for single drive axle. It shall include a buzzer and blinking lamp with a differential lock switch. The differential will unlock with ignition off and will operate at less than 5mph.			
18.	**BRAKE SYSTEM**			
18.1.	Service brakes to be Meritor air operated drum type and			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	comply with all applicable Ontario and Canadian CMVSS-121 standards.			
18.2.	Front brakes shall be Meritor Q+ 16.5 X 6 cast spider heavy duty cam, Meritor automatic slack adjusters. The brakes shall be equipped with fire and emergency severe service, non-asbestos lining. Brake cast iron drum to be outboard mounted.			
18.3.	Rear brakes shall be Meritor Q+ 16.5 X 7 P cast spider cam double anchor, cast shoes with Haldex automatic slack adjusters with stainless steel clevis pins. The brakes shall be equipped with fire and emergency severe service, non-asbestos linings. Brake cast iron drum to be outboard mounted.			
18.4.	A Wabco 4S/4M anti-lock brake system with traction control will be provided on front and rear axles. Dash mounted anti-lock lamp will be provided to indicate malfunction.			
18.5.	The air compressor shall be 18.7 CFM minimum, capable of rapid air pressure build up, as required by N.F.P.A. 1901- Most Current edition.			
18.6.	The drive axle spring parking chambers shall be 36/36 Haldex Long stroke.			
18.7.	A separate air pressure tank of approximately 1,350 cu. in. shall be provided for the air horn system. The tank shall be provided with a pressure protection valve to prevent the use of air horns or other accessories when the air pressure system drops below (80 Psi).			
18.8.	All air reservoirs will be equipped with manual cable operated drain valves. Cables to be routed to be easily accessible by operator/driver. All drain cables must be equipped with labels attached to the rub railings to identify the air tank that is being drained.			
18.9.	A Wabco air dryer with heater shall be mounted inboard on RH rail.			
19.	**AUXILIARY BRAKING SYSTEM**			
19.1.	The Detroit engine shall be equipped with a compression engine brake system.			
19.2.	An on/off steering column lever shall control the engine brake. A light to indicate the activation shall be mounted in dash display.			
20.	**TIRES AND WHEELS**			
20.1.	The tires and wheels shall meet the apparatus load range.			
20.2.	The front tires shall be MICHELIN XZU-S2 315/80R22.5 20 PLY radial tires.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
20.3.	The rear tires shall be MICHELIN XDS2 315/80R22.5 20 PLY radial tires.			
20.4.	Front wheels shall be polished Alcoa Ultra ONE 89U64X 22.5X9.00 10-Hub Pilot 5.99 Inset aluminum.			
20.5.	Rear outer wheels shall be polished Alcoa Ultra ONE 89U64X 22.5X9.00 10-Hub Pilot Aluminum Disc.			
20.6.	The wheels will be fitted with pressure indicators on each of the vehicle's tire valve bodies, indicating whether there is sufficient pressure for the tire.			
21.	**POWERTRAIN**			
21.1.	The vehicle shall be equipped with a Detroit DD8 7.7L 6 CYL 375 HP @ 2200 RPM, 2600 GOV RPM, 1050 LB-FT @ 1200 RPM			
21.2.	Side of hood air intake with NFPA compliant ember screen and fire-retardant Donaldson air cleaner.			
21.3.	The cooling system shall have sufficient capacity to meet extended periods of full load operation at local ambient temperatures and maintain the engine at a temperature not to exceed the maximum or minimum operating temperature as recommended by the engine manufacturer.			
21.4.	The radiator shall be of a design and size recommended by the engine and transmission manufacturers for the intended application.			
21.5.	Coolant shall be an extended life coolant type with protection to minus -60 degrees °F.			
21.6.	Coolant hoses shall be Gates Blue Stripe High-Temperature hose or equivalent. Coolant hoses shall be installed using constant tension hose clamps.			
21.7.	The engine cooling system shall incorporate a thermostatically controlled clutch fan. The Horton fan will include a dash switch and indicator light.			
21.8.	The apparatus manufacturer must install a closed-circuit auxiliary heat exchanger with control at the pump operator's panel to provide for additional cooling capacity without the loss of coolant.			
21.9.	All heater hose fittings and adaptors shall be brass. Plastic connector and fittings shall not be acceptable.			
21.10.	Low coolant indicator light and buzzer alarm on dash and the pump panel shall be provided.			
21.11.	The fuel system shall be compatible with the engine manufacturer's recommendations for flow and pressure.			
21.12.	The fuel system components shall be protected from exhaust heat and mechanical damage during the normal use of the apparatus.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
21.13.	The fuel tank shall be easily removable for repairs (brackets welded to tank will not be accepted). A single fuel tank with a minimum capacity of 189 Liter (50 US gallons) shall be installed. The tank shall be rectangular made of aluminum.			
21.14.	A D.E.F. 6-gallon tank shall be provided. The D.E.F. tank shall not encroach upon any designed stowage compartment. A label on the body shall clearly identify the location of the D.E.F. tank.			
21.15.	Spin-on type fuel filter shall be installed as recommended by engine manufacturer.			
21.16.	Detroit fuel/water separator with water in fuel sensor, hand primer and 12-volt preheater shall be installed.			
21.17.	The vehicle shall be equipped with an Allison model 3000EVS automatic transmission. The transmission shall be configured to maximize the pump output.			
21.18.	The transmission shall be controlled by a pushbutton selector mounted to the right of driver and lighted for night operation.			
21.19.	A transmission temperature gauge shall be supplied on the cab dash and pump panel with a warning light and/or buzzer for high transmission temperature.			
21.20.	The driveline shall be a heavy-duty series and have glide coat spline on all slip shafts.			
21.21.	All portions of the driveline shall be balanced at maximum operating speed; driveline angle must be within Manufacture's specifications.			
21.22.	The exhaust system and after-treatment system shall be installed below the right-hand side steps and meet all applicable noise standards. Heat shields will be provided to protect any part of the apparatus susceptible to heat damage. The muffler shall be aluminized, and any flex tube used shall be stainless steel. The flex tube will be installed with overlapping clamp type seals.			
21.23.	An engine aftertreatment device, automatic over the road active regeneration and dash mounted single regeneration request/inhibit switch shall be supplied.			
21.24.	The exhaust pipe shall terminate in front of the right rear wheels 1 inch below body at 90 degrees.			
21.25.	The exhaust pipe shall be equipped with a diffuser.			
22.	**CAB EXTERIOR**			
22.1.	The cab shall be an air ride.			
22.2.	The front grill shall have a non-removable bug screen			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	mounted behind grill.			
22.3.	The cab shall include LH and RH exterior grab handles with single rubber insert.			
22.4.	Bright finish front grill, radiator shell/hood bezel			
22.5.	Chrome hood mounted air intake grill.			
22.6.	Two (2) Stutter tone 63.5 cm (25") or equivalent air horns shall be hood mounted. Horns shall include snow shield			
22.7.	The air horns shall be controlled by lanyards easily accessible by Officer and Driver.			
22.8.	A single electric horn shall be installed controlled by steering wheel center horn pad.			
22.9.	Where applicable, four (4) sets of keys shall be provided per vehicle for ignition, doors, cabinets, and all other attachments.			
22.10.	LED headlight composite headlamps with bright bezels shall be installed.			
22.11.	LED aerodynamic marker lights.			
22.12.	Daytime running lights - low beam only.			
22.13.	Dual west coast bright finish heated mirrors with led lights and LH and RH remote.			
22.14.	LH and RH 8-inch bright finish convex mirrors mounted under primary mirrors.			
22.15.	A RH down view mirror shall be installed on the right-hand door.			
22.16.	Composite exterior sun visor.			
22.17.	No rear window.			
22.18.	Tinted door glass LH and RH with tinted operating wing windows.			
22.19.	Electric door window regulators.			
22.20.	Tinted windshield.			
22.21.	8-liter windshield washer reservoir, cab mounted, with fluid level indicator.			
22.22.	Mud flaps shall be installed behind the front wheels to protect the body and components from road spray.			
22.23.	A windshield washer system with the largest available OEM reservoir shall be installed.			
23.	**ALTERNATOR AND BATTERY**			
23.1.	The alternator shall be a minimum 300 amp, 12-volt 40-SI brushless pad alternator with remote battery voltage sense. The alternator output must meet the minimum continuous electrical load requirement on this apparatus.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
23.2.	Two (2) batteries shall have a minimum combined value of 3000 CCA. High cycle12 volt batteries shall be installed. All batteries will be contained within a box and covered to protect them from road spray.			
23.3.	A positive and negative post for jumpstart shall be located on the frame next to the starter and easy to access.			
24.	**CAB INTERIOR**			
24.1.	Opal gray vinyl interior.			
24.2.	The inside door shall be molded plastic door panel without vinyl insert with aluminum kick plate lower door.			
24.3.	Black mats with single insulation.			
24.4.	It shall have a forward roof mounted console with upper storage compartments without netting.			
24.5.	The dash will have a storage bin.			
24.6.	Gray/Charcoal flat dash.			
24.7.	Smart switch expansion module – dash mounted.			
24.8.	To include heater, defroster, and air conditioner.			
24.9.	Premium insulation option.			
24.10.	Includes solid-state circuit protection and fuses.			
24.11.	It shall be a 12v negative ground electrical system.			
24.12.	Door activated dome/red map lights located in the cab roof forward LH and RH and rear LH, RH, and center.			
24.13.	LH and RH manual door locks.			
24.14.	One (1) Dash mounted 12V power outlet and one (1) dash mounted dual 2.1 Amp USB-C outlet.			
24.15.	The driver's seat shall be a H.O Bostrom Sierra Air-50 high back air suspension with NFPA1901-2009/2016 compliant seat sensor.			
24.16.	The passenger seat shall be a H.O. Bostrom Sierra AIR-30 high back air suspension passenger seat with adjustable recline, fixed lumbar and NFPA 1901-2009/2016 compliant seat sensor.			
24.17.	The seat sensor display shall be mounted in the upper forward center console.			
24.18.	LH and RH integral door panel armrests.			
24.19.	The driver and passenger seats shall be gray vinyl with vinyl insert.			
24.20.	The seat belts shall be NFPA 1901 high visibility orange.			
24.21.	All seats shall be equipped with three (3) point retractable seat belts.			
24.22.	The steering column shall be equipped with tilt and			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	telescopic steering wheel column.			
24.23.	The steering column shall contain the self-cancelling turn signal switch with dimmer, washer/wiper (two speeds with delay) in handle and the hazard switch.			
24.24.	There shall be a driver and passenger interior sun visors.			
25.	**CAB INSTRUMENTS AND CONTROLS**			
25.1.	There shall be an engine remote interface with park brake interlock.			
25.2.	Chassis shall include an engine remote interface for remote throttle.			
25.3.	Chassis shall include an engine remote interface connector at back of cab.			
25.4.	The heavy-duty onboard diagnostics interface connector shall be located below LH dash.			
25.5.	An NFPA vehicle data recorder and seatbelt display shall be installed.			
25.6.	Instrument cluster shall have an engine hour meter, trip meter, turn signal indicators and high beam indicator.			
25.7.	Instrument cluster shall include a 2” electric fuel gauge, engine coolant temperature gauge and a 2” transmission oil temperature gauge.			
25.8.	Instrument cluster shall include 2” air pressure gauges for primary and secondary.			
25.9.	Instrument cluster shall include a low air pressure indicator light and audible alarm.			
25.10.	Air restriction indicator with graduations shall be mounted in the dash.			
25.11.	Electronic cruise control push button on steering wheel.			
25.12.	Fast idle activated through dash cluster and high idle option.			
25.13.	An electronic back-up alarm that is activated when the vehicle is in reverse shall be installed to warn people near or on the apparatus that the vehicle is backing up.			
25.14.	The Chassis and vehicle shall be equipped with an Advanced Electronic Stability Control System. A dash-mounted warning light shall turn off after approximately ten (10) seconds if the sensor is functioning. The system shall continue to function in the event of non-critical faults.			
25.15.	A radio AM/FM/WB world tuner with Bluetooth and USB and auxiliary inputs, j1939 shall be dash mounted.			
25.16.	Two (2) radio speakers shall be mounted in the cab.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
25.17.	The AM/FM antenna shall be mounted on forward LH roof.			
25.18.	There shall be one (1) valve parking brake system with dash valve control auto neutral and warning indicator.			
25.19.	Master battery switch left side of driver's seat shall be provided.			
25.20.	Keyed ignition switch shall be provided.			
	FIRE PUMP COMPARTMENT CONSTRUCTION GENERAL			
26.	**FIRE PUMP COMPARTMENT**			
26.1.	The fire pump instrument panel shall be located on the left side of the fire apparatus (Side Mount).			
26.2.	The pump panels right and left side will be enclosed with roll up doors to create a fully enclosed pump house.			
26.3.	The pump module compartment shall be fully enclosed, on all sides.			
26.4.	The pump module body shall be a self-supported structure mounted independently from the body and chassis cab. The pump module shall be constructed entirely of extrusions and aluminum plate. The framework shall be formed from beveled aluminum alloy extrusions and shall be electrically seam welded at each joint using 5356 aluminum alloy welding wire. The main framework to be 3.00 x 2.00 x 0.25, 6061-T4 aluminum extrusion. The pump module design must allow normal frame deflection through isolation mounts without imposing stress on the pump module structure or side running boards. The pump module shall consist of a welded framework, properly braced to withstand chassis frame flexing. The pump module support shall be bolted to the frame rails of the chassis.			
26.5.	The pump module control panels shall be 1/8" aluminum.			
26.6.	The left lower pump panel shall be ease removable for ease of maintenance. The upper panel containing all gauges will be hinged on the left side and able to swing open 90 degrees, closure will be compression latches. The panels shall have the controls displayed in an organized method of pump control with colour-coded labels to NFPA standard. All pump panel controls shall be clearly labelled to indicate function. The discharge controls shall be clearly labelled and colour-coded. Discharge drains and bleeder controls installed at the pump panel shall be colour-coded to match the corresponding discharge control.			
26.7.	The lower right pump panel shall be removable for ease			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	of maintenance. The upper panel will be hinged on the right side and able to swing open 90 degrees, closure will be compression latches. It shall allow easy access to plumbing and valves.			
26.8.	The engineering, layout, and functional "user friendly" design of the pump panel is of vital importance for this apparatus.			
26.9.	The left and right-side pump panels shall be provided with a full LED bar light, lights with switch on the panel. The hooded panels shall prevent glare to the operator's view.			
26.10.	Access shall be provided for servicing of the pump, all piping, valves, and controls. Wherever possible, hinged access doors and valve access panels shall be used to reduce repair costs. It is expected that the front, right side, and upper panels will be of quick removal type.			
27.	**PUMP ENCLOSURE HEATING**			
27.1.	The pump house shall contain an engine recirculation heater that shall be plumbed to the engine cooling system and shall be controlled with a control on the operator’s panel, minimum 40,000BTU.			
27.2.	The bottom of the pump house shall be fitted with a removable heat pan. The heat pan shall totally enclose all sides, front, and rear bottom of the pump house and shall be constructed from aluminum sheet and shall be installed to the underside of the pump house that shall be easily removable.			
28.	**PUMP TO CHASSIS WIRING**			
28.1.	Electrical wiring from the pump and applicable chassis wiring shall terminate in a sealed weatherproof junction box inside the pump enclosure next to pump access door. All connectors must be labeled for easy identification on the wiring diagrams. This will accommodate the removal of the pump, should removal be required for service.			
29.	**PUMP SPEEDLAY PRECONNECT HOSE BED**			
29.1.	Over the fire pump enclosure shall be an area for a double pre-connect speed lay compartments. The compartments shall be an integral part of the pump enclosure construction and shall not be a bolted-on tray attached to the top of the apparatus body.			
29.2.	The speed lay hose trays will be built of a durable material with two points on each end for easy maneuvering for loading and unloading of the trays.			
29.3.	Each speed lay pre-connect tray will hold a minimum of			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	200’ of 1.5” hose with nozzle.			
29.4.	The speed lay hose bed area shall have a vinyl cover installed on the sides of the speed lay bay openings. Covers shall be permanently attached to the top checker plate cover, and to the sides of the pump compartment, by hook and loop strips on each flap. The speed lay hose bed covers shall be black in colour.			
	PUMP AND PLUMBING GENERAL			
30.	**PUMP WARRANTY**			
30.1.	Waterous shall provide a limited manufacturer's pump warranty with a total protection package to be free from defects in material and workmanship, under normal use and service, for a period of seven (7) years from the date placed into service.			
31.	**STAINLESS STEEL PLUMBING WARRANTY**			
31.1.	A Stainless-steel Plumbing/Piping warranty shall be offered for a period of ten (10) years from the date of delivery.			
31.2.	All auxiliary suction and discharge plumbing related fittings, and manifolds shall be fabricated with schedule 10 stainless steel pipe, brass, or high-pressure flexible piping with stainless steel couplings. Galvanized components and/or iron pipe shall NOT be accepted to ensure long life of the plumbing system without corrosion or deterioration of the waterway system. Where waterway transitions are critical (elbows, tees, etc.), no threaded fittings shall be allowed to promote the smooth transition of water flow to minimize friction loss and turbulence. All piping components and valves shall be non-painted, unless otherwise specified. All piping welds shall be wire brushed and cleaned for inspection and appearance. The high-pressure flexible piping shall be black SBR synthetic rubber hose with 300 PSI working pressure and 1200 PSI burst pressure for flexible piping sizes 1.5" through 4". Sizes 3/4", 1" and 5" are rated at 250 PSI working pressure and 1000 PSI burst pressure. All sizes are rated at 30 in HG vacuum. Reinforcement consists of two plies of high tensile strength tire cord for all sizes and helix wire installed in sizes 1" through 5" for maximum performance in tight bend applications. The material has a temperature rating of -40° F to +210° F. The stainless-steel full flow couplings are precision machined from high tensile strength stainless steel. All female couplings are brass. Mechanical grooved and male 3/4" and 1" couplings are brass. A high tensile			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	strength stainless steel ferrule with serrations on the I. D. is utilized to assure maximum holding power when fastening couplings to hose.			
32.	**FIRE PUMP AND RELATED EQUIPMENT**			
32.1.	The fire pump shall be tested and certified to CAN/ULC -S515-M88 by a certified third party. A copy of the test results shall be provided to the purchaser upon delivery of the apparatus and an engraved certification plate shall be affixed to the pump operator's panel.			
32.2.	The fire pump shall be a Waterous CSU single stage centrifugal pump. It shall be of a size and design to mount on the chassis rails of commercial truck chassis with a minimum rated capacity of 5000 LPM – 1050 IGPM and shall meet all CAN/ULC -S515-M88 and NFPA current Edition requirements.			
32.3.	The pump shall be the Class "A" type and shall deliver the percentage of rated discharge at pressures indicated below. • 100% of rated capacity at 150 PSI net pump pressure • 100% of rated capacity at 165 PSI net pump pressure • 70% of rated capacity at 200 PSI net pump pressure • 50% of rated capacity at 250 PSI net pump pressure			
32.4.	The entire pump shall be hydrostatically tested to a pressure of 600 PSI. The pump shall be fully tested at the pump manufacturer's factory to the performance spots as outlined by the latest NFPA Pamphlet No. 1901. The pump shall be free from objectionable pulsation and vibration.			
32.5.	The Pump drive unit shall be of sufficient size to withstand the full torque of the engine in both road and pump operating conditions. The drive unit shall be designed with ample capacity for lubrication reserve and to maintain the proper operating temperature without supplemental cooling.			
32.6.	Driveline equipment must be of the heavy-duty type, with hollow-tube driveline, and heavy-duty universals. The engine shall provide sufficient horsepower and RPM to enable the pump to meet and exceed its rated performance.			
32.7.	The Allison transmission shall be provided with direct gear pump lock-up provision. Transmission shift control pad in cab will lock transmission in direct drive pump position, when in			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	pump gear.			
32.8.	The discharge and intake piping, valves, drain cocks and lines and intake and outlet closures, shall be suitable to withstand a minimum hydrostatic burst pressure of 3450 KPA (500 PSI.) The only exception to this requirement shall be the tank fill and tank suction piping on the tank side of the valve.			
32.9.	Stainless steel fittings shall be utilized (no galvanized fittings will be permitted) for tank fill or tank to pump.			
32.10.	The plumbing of the pump shall be built to firefighting standards, using stainless steel pipe or premium quality fire apparatus high-pressure Class 1 flexible piping. The flexible piping shall have a minimum burst pressure rating of 8400 kPa (1200 Psi) and a temperature rating of -40 to 210 degrees F. Where vibration or body flexing may damage or loosen piping or where a coupling is required for servicing, the piping shall be equipped with Victaulic couplings, 90-degree elbows shall be of the sweep type. All plumbing and valving shall meet NFPA standards.			
32.11.	In-line valves used in the fire pump installation shall be all quarter-turn ball action, unless otherwise specified. To allow easy repair or replacement of valve seats, all control valves; discharge and intakes (suction) shall be AKRON heavy duty brass swing-out quarter turn full flow ball valves.			
32.12.	All valves, (suction) intake and discharge valves mounted on the pump shall be flush mounted type (exposed valves will not be acceptable). Either panel controlled or with remote control type handles. No valves shall be installed upside down.			
33.	**PUMP SHIFT**			
33.1.	The drive unit shall be provided with an air pump shift system. The control valve shall be a spring loaded guard lever that locks in "Road" or "Pump" mode. To the left of the pump shift control, there shall be two indicator lights to show the position of the pump when the control is moved to "Pump" position. A green light shall be energized when the pump shift has been completed and shall be labeled "PUMP ENGAGED"; a second green light shall be labeled "OK TO PUMP" energized when both the pump shift has been completed and the chassis automatic transmission is engaged. A third green indicator light shall be installed adjacent to the throttle on the pump operator's panel. This light shall be labeled "PUMP ENGAGED". In addition to this indicator light, an additional indication			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	shall be provided to the pump operator at the panel when the pump is ready to pump. This additional indication shall be that one (1) of the operator's panel illumination lights will only activate when the "OK TO PUMP" indicator is lit.			
34.	**DRAINS AND BLEEDERS**			
34.1.	The pump shall be equipped with a Trident Master Pump drain to allow draining of the lower pump cavities, volute and selected water carrying lines and accessories. The drain shall have an all-brass body with a stainless-steel return spring. The valve shall be installed lower than the main pump body to permit complete draining of the pump and water carrying lines and accessories. Secondary drains shall be provided at any low points in the pipe. All drains must be controlled from the left (driver's side) pump panel or pump panel nearest to the valve. All ball valve drains will be ¾" lift handle type.			
34.2.	Valve intake shall be equipped with minimum 19 mm (3/4") bleeder valves controlled at the valve or pump panel.			
34.3.	All 2.5" or larger discharges shall be equipped with minimum 3/4" bleeder valves controlled at the valve or pump panel.			
34.4.	Drain and bleeder discharges shall terminate below the frame and heat pan of the apparatus.			
34.5.	Discharge drains and bleeder controls mounted at the pump panel shall be colour coded to match the corresponding discharge.			
35.	**PRIMING SYSTEM**			
35.1.	A Trident air operated, 12-volt automatic operation, 2 location primer system will be installed. The panel rocker switch will have a "PRIME" position, "OFF", and an "AUTO" position. When pushed and held in the "PRIME" position, air will be supplied to the primer causing sufficient vacuum to prime the fire pump. Once prime is achieved, the operator can move the rocker switch to the "AUTO" position which will automatically restart the primer if the discharge pressure drops below 20-PSIG. An indicator light built into the rocker switch will be lit when the "AUTO" mode is engaged. An interlock on the wiring harness will be wired to allow for AUTOMATIC operation only when the "OK to pump indicator" light is ON. The panel will have a "PRIME" switch for the driver side master intake valve. This prime option is used in conjunction with the valve to accelerate drafting			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	operations.			
36.	**ENGINE CONTROL**			
36.1.	A FRC InControl 4 pressure governor and monitor shall be installed at pump operator's panel.			
36.2.	The following continuous displays shall be provided: • Engine RPM. • Battery voltage. • Engine coolant temperature. • Engine oil pressure. • Battery voltage.			
37.	**MASTER GAUGES**			
37.1.	Innovative Controls, 4.5" gauges shall be provided. The master intake and discharge gauges indicate pressure from -30hg to 600 PSI. The pressure gauge shall be filled with pulse and vibration dampening Interlube to lubricate the internal mechanisms to prevent lens condensation and to ensure proper operation to minus 40 degrees F. To prevent internal freezing and to keep contaminants from entering the gauge, the stem and Bourdon tube shall be filled with low temperature material and be sealed from the water system using an isolating Sub Z diaphragm located in the stem. The gauges dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
38.	**WATER LEVEL GAUGE**			
38.1.	There shall be one (1) FRC Tankvision Pro 400 LED electronic water level gauge located on the operator's control panel.			
39.	**TEST PORT**			
39.1.	Test port connections for pressure and vacuum shall be provided at the pump operator's panel. One shall be connected to the intake side of the pump, and the other to the discharge manifold side of the pump. They shall have 0.25 in. standard pipe thread connections and be manufactured of non-corrosive polished stainless steel or brass plugs.			
40.	**INTAKE RELIEF VALVE DISCHARGE**			
40.1.	There shall be one (1) suction side stainless steel 2-1/2-inch intake relief pump valve with a discharge pipe that will exit to the left (driver side) of truck, below heat pan.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	For normal pumping operations, the relief valve shall not be capped and there shall be a placard stating “DO NOT CAP” installed.			
41.	**PUMP COOLER**			
41.1.	There shall be a 3/8-inch (9.5 mm) line running from the pump to the water tank to assist in keeping the pump water from overheating. A quarter turn on/off valve shall be installed on the operator's panel.			
42.	**HEAT EXCHANGER**			
42.1.	A closed-circuit auxiliary heat exchanger shall be installed with controls at the pump operator’s panel. The system shall provide additional engine cooling capacity without the loss of coolant. The operator must be able to shut off water to the heat exchanger from the pump panel. The intake water feed from the hydrant shall not feed the heat exchanger without the operator having opened the cooler valves on the pump panel.			
42.2.	Piping from the fire pump to the heat exchanger shall be with high pressure flexible hose lines with threaded copper fittings. The piping shall be installed to completely drain with no low points in the hose to prevent freezing.			
	SUCTION			
43.	**SUCTION PORTS (6 INCH INTAKES)**			
43.1.	A 6” pump manifold inlet shall be provided on each side of the pump. The main pump inlets shall have National Standard Threads and include removable screens designed to provide cathodic protection for reducing deterioration in the pump.			
43.2.	There shall be two (2) 6" long handled chrome plated self-venting lug caps installed on the apparatus. The caps shall be National Standard Thread.			
43.3.	Two (2) Electric Master Inlet Intake Valves (MIV) shall be installed, one on each suction port. The valve shall be 6" NH and include a drain valve.			
44.	**FRONT SUCTION PORT (4 INCH INTAKES)**			
44.1.	A 4” pump manifold inlet shall be provided on the front bumper. The inlet shall have a 90 degree chrome Storz fitting and include a removable screen designed to provide protection from debris entering the pump.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
44.2.	There shall be one (1) 4" hard suction hose five (5) feet in length installed on the swivel connection, with a pre-connected 4” low bottom strainer and mounting plate.			
44.3.	One (1) Electric Master Inlet Intake Valve (MIV) shall be installed. The valve shall be 5" bolted flanged and include a drain valve.			
45.	**LEFT AUXILLLARY SUCTIONS**			
45.1.	There shall be a 2.5" gated suction inlet with a .75-inch bleeder installed on each side of the apparatus. A total quantity of two (2) shall be provided with the following specified components: A 2.5" Akron Brass 8800 series swing-out valve with stainless steel ball. The suction shall be controlled from the operator's panel. The plumbing shall consist of 2.5" piping and shall incorporate a manual drain control installed below the pump area for ease of access. The suction termination shall include the following components: • One (1) 2.5" NST Swivel Female adapter with screen. • One (1) 2.5" NST male self-venting plug, secured by a chain.			
46.	**TANK SUCTION**			
46.1.	One (1) 3" slow close valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type. The valve shall be controlled from the operator's panel. The supply line shall have a minimum of 2273 L/min (500 imperial GPM) flow capacity and shall be flexible to allow movement between the tank and the pump module. A check valve shall be provided in the system to prevent pressurizing the water tank.			
47.	**DISCHARGE LEFT (DRIVER) SIDE**			
47.1.	There shall be two (2) gated discharge installed on the left side of the apparatus. They shall be provided with the following specified components: A 2.5" Akron Brass 8800 series swing-out valve with a stainless-steel ball. The discharge shall be controlled from the operator's panel. The plumbing shall consist of 2.5” piping and shall			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	incorporate a manual drain control installed below the pump area for ease of access. The 30-degree discharge shall include the following adapters: • Two (2) 2.5" NH Female by Male CSA swivel adapter. • Two (2) 2.5" Female CSA self-venting cap, secured by a chain. An Innovative Controls, 2.5" (63mm) gauge shall be supplied for the discharge pressure reading of 0-400 psi. The gauge shall be white faced and black lettering. The gauge dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
48.	**LARGE DISCHARGE RIGHT (PASSENGER) SIDE**			
48.1.	There shall be a master discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components: A 3"Akron Brass 8800 series Slo-Cloz swing-out valve with a stainless-steel ball. The discharge shall be controlled from the operator's panel. The plumbing shall consist of 4” piping and shall incorporate a manual drain control installed below the pump area for ease of access. The discharge termination shall include the following components: • One (1) 4" NST Female swivel by 4” Storz cast aluminum 30-degree elbow. • One (1) 4" female Storz self-venting cap, secured by a chain. An Innovative Controls, 2.5" (63mm) gauge shall be supplied for the discharge pressure reading of 0-400 psi. The gauge shall be white faced and black lettering. The gauge dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
49.	**DISCHARGE RIGHT (PASSENGER) SIDE**			
49.1.	There shall be a gated discharge installed on the right side of the apparatus. A total quantity of one (1) shall be provided with the following specified components: A 2.5" Akron Brass 8800 series swing-out valve with a stainless-steel ball.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	The discharge shall be controlled from the operator's panel. The plumbing shall consist of 2.5” piping and shall incorporate a manual drain control installed below the pump area for ease of access. The 30-degree discharge shall include the following adapters: • One (1) 2.5" NH Female by Male CSA swivel adapter. • One (1) 2.5" Female CSA self-venting cap, secured by a chain. An Innovative Controls, 2.5" (63mm) gauge shall be supplied for the discharge pressure reading of 0-400 psi. The gauge shall be white faced and black lettering. The gauge dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
50.	**2.5 INCH REAR RIGHT DISCHARGE**			
50.1.	There shall be a gated discharge installed on the rear right of the apparatus. A total quantity of one (1) shall be provided with the following specified components: A 2.5"Akron Brass 8800 series swing-out valve with a stainless-steel ball. The discharge shall be controlled from the operator's panel. The plumbing shall consist of 2.5” piping and shall incorporate a manual drain control installed below the pump area for ease of access. The discharge termination shall include the following components: • One (1) 2.5" Female NPT by 2.5" Male CSA 30-degree elbow. • One (1) 2.5" female CSA self-venting cap, secured by a chain. An Innovative Controls 2.5" gauge shall be supplied for the discharge pressure reading of 0-400 psi. The gauge shall be white face and black lettering. The gauge dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
51.	**SPEED LAY DISCHARGE – 1.5”/1.75”**			
51.1.	Two (2) forward speed lays shall be installed on top of			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	the pump module. The speed lays shall hold 200' of 1.5" double jacket fire hose on each side. A 1.5" NPSH mechanical swivel hose connector shall be used in each speed lay to provide access to hose in either direction. Each speed lay shall have one (1) 2" Akron brass 8800 series valve. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. Valve shall be controlled with a chrome-plated push/pull locking "T" handle mounted on the pump panel. There shall be Innovative Controls, 2.5" pressure gauge mounted on the panel near each control to indicate pressure. Each discharge shall also come equipped with a lift up ¾" drain valve. Each discharge must be capable of flowing 180 GPM or greater.			
51.2.	A 3/16” aluminum speed lay tray will be supplied for each speed lay. The tray will have a black Polyarmor finish and have hand hold cutouts on both ends for easy installation and removal.			
52.	**FRONT DISCHARGE (BUMPER)**			
52.1.	There shall be a 1.5” gated discharge installed inside the front bumper compartment of the apparatus. A total quantity of one (1) shall be provided with the following specified components: A 1.5" mechanical swivel hose connector shall be used to use of the hose in either direction. It will have 1.5” NPSH threads. A 2"Akron Brass 8800 series swing-out valve with a stainless-steel ball. The discharge shall be controlled from the operator's panel. The plumbing shall consist of 2” piping and shall incorporate a manual drain control installed below the pump area for ease of access. The discharge termination shall include the following components: An Innovative Controls, 2.5" gauge shall be supplied for the discharge pressure reading of 0-400 psi. The gauge shall be whited face and black lettering. The gauge dial shall be provided with pressure measurement indication readings in kPa {kilopascals} in addition to Psi, providing dual pressure scales on the same dial.			
53.	**TANK FILL LINE**			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
53.1.	One (1) 2" discharge with an Akron Brass 8800 series brass valve shall be plumbed to the tank. The valve shall be a quarter turn ball type and fixed pivot design to allow easy operation at all pump pressures. The 2"(5.08cm) valve outlet terminates with 2" (5.08cm) grooved connection. The valve shall be controlled from the operator's panel.			
	TANK			
54.	**WATER TANK**			
54.1.	The tank shall be Fire truck design with flat back, flattop, low center of gravity, low profile, design.			
54.2.	The tank shall be manufactured by Brayneck Canaplast Inc.			
54.3.	The water tank shall have a minimum capacity of 1200 gallons. It shall be of a specific configuration and designed to meet the customer's requirements. The water tank shall be constructed of 1/2" thick copolymer material. The water tank shall be welded with Heavy Duty extruded joints inside and outside. The material shall be certified, high quality, non-corrosive, stress relieved thermoplastic. The tanks will be white in colour. The tank shell thickness may vary depending on the application and may range from ½ to 1" as required. The unit shall incorporate transverse partitions manufactured with 3/8" copolymer material which shall interlock with a series of longitudinal partitions constructed of 3/8" copolymer. All swash partitions shall be designed to allow for maximum water and air flow between compartments and are fully welded to each other as well as to the tank's walls and floor. Tank will be baffled in accordance with NFPA 1901 requirements. The top of the tank is equipped with lifting points designed to facilitate tank removal.			
55.	**FILL TOWER**			
55.1.	The tank shall be equipped with a combination vent/overflow and manual fill tower. The fill tower shall have a minimum OD of 14" x 14". The tower shall be in the portion in front of the tank. There shall be a vent / overflow installed inside and to the extreme rear of the tower approximately 2½" down from the top of the fill tower. This vent / overflow shall be of a standard schedule 40 polypropylene pipe with minimum ID of 4". The vent / overflow shall be piped internally through the tank and designed to discharge water behind the rear wheels as required in NFPA 1901 to not interfere with rear tire traction. The tower shall have a 3/8" thick removable copolymer screen and a stainless steel			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	bolted hinged-type cover. The tank cover shall be constructed of 1/2" thick copolymer material, white in colour. The top of the cover shall be engraved in blue, green, yellow, or black, indicating what the tower should receive.			
56.	**SUMP**			
56.1.	There shall be one (1) sump standard per tank. The sump shall be constructed of a minimum of 1/2" copolymer material and be in the left front quarter of the tank, unless specified otherwise. On all tanks that require a front suction, a 3" schedule 40 polypropylene pipe shall be installed from the front of the tank to the sump location and equipped with an anti-swirl plate located approximately 3” above the inside floor. The sump shall have a minimum 3" NPT threaded outlet on the bottom for a drain valve Akron brass 8800 series and valve shall be controlled from pump panel. This shall be used as a combination clean-out and drain.			
57.	**TANK OUTLETS**			
57.1.	There will be two (2) standard tank outlets: one (1) 3" for the tank-to-pump suction line, and one (1) 2" for tank fill line. All tank fill couplings shall be backed with a flow deflector especially designed to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates of up to 1000 G.P.M.			
58.	**HOSE BED**			
58.1.	The apparatus hose bed compartment shall be provided on top of the water tank, it shall be smooth and free of sharp corners that may catch hose or couplings.			
58.2.	The hose bed shall be covered with black PVC Turtle-Tiles, to assist in air circulation and hose drying.			
58.3.	Hose bed dividers constructed of aluminum shall be installed. The divider shall be reinforced as required to protect the divider from bending caused by shifting of the hoses. There shall be one (1) forward divider to separate a hose bed dunnage area where the water tank fill tower is located from the main hose bed. The divider shall be secured to the hose bed by utilizing adjustable track type channels and fasteners. The divider shall be the full width and depth of the hose bed.			
58.4.	The hose bed shall be as large as possible, but hold the minimum required hose loads of the following: • 800’ of 4" hose			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	• 600’ of 2.5" hose • 500’ of 1.50" hose			
58.5.	There shall be a double door aluminum checker plate hose bed cover. Each door will be reinforced and be capable of supporting 400lbs. Each door will be capable of being opened independently. The rear of the hose bed will have a folding vinyl flap that is held in place by 2” wide heavy-duty hook and loop straps. The doors will be fabricated of 0.188” polished aluminum checker plate with stainless steel hinges. There will be a gas shock to hold each cover in the open position and assist with lifting. The rear of the hose bed doors will include one (1) full width extruded handrail to assist in opening and closing the doors. The hose bed cover will be wired to the open-door warning light in chassis cab to warn crew when the cover is open when the transmission is placed into drive or reverse movement mode. The doors will include a manual lock to prevent the doors from inadvertently closing and will also serve as a physical safety barrier. This will be located at the front and rear of the doors. The final design will be confirmed prior to construction.			
59.	**TANK CERTIFICATION**			
59.1.	All water tanks are fully inspected and tested for any leaks and defects. All tanks come with a tank certification that states the maximum fill rate, maximum fill pressure, tank weight, water and foam tank capacity, manufacturing date and serial number.			
60.	**TANK MOUNTING**			
60.1.	The tank shall be cradled mounted to the exact design suggested by the manufacturer and easily removed from the body. The tank shall be isolated from the cradle and chassis frame with 3" X 1" rubber sills.			
61.	**TANK WARRANTY**			
61.1.	Brayneck Canaplast Inc. warrants each water tank, water skid tank and foam tank to be free from defects in material and workmanship for the service life of the original vehicle (a vehicle must be used for normal fire suppression applications). This warranty is transferable within the United States and Canada only with prior written approval by Brayneck Canaplast.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
62.	**INTERMEDIATE REAR PLATFORM**			
62.1.	The intermediate rear platform shall be 12” in depth and shall center on the rear of the truck. The step shall be constructed of diamond back tread plate. The step shall be mounted on the flat back of the apparatus with gusset-type mounting to provide sufficient support for loading and deploying the hose and for gaining access to the hose-bed area.			
	BODY DESIGN			
63.	**GENERAL REQUIREMENTS: Apparatus Body, substructure, and sub-frame**			
63.1.	The apparatus body, substructure, and sub-frame shall be designed with sufficient carrying capacity for the weight of the specified hose, equipment, water, and to withstand the rigours of emergency service operations typical of a busy urban fire department.			
63.2.	To extend the service life of the vehicle, the body shall be separate and removable from the chassis frame and be able to be reinstalled on a new chassis.			
63.3.	Prior to the construction of this vehicle, various chassis attachments such as battery boxes, air reservoirs, mufflers and tail pipes, filters and other bolt-on frame attachments may be removed and relocated to permit full utilization of the chassis for equipment compartments. The equipment removed shall be relocated as noted in these specifications and/or remounted under the chassis frame or cab.			
63.4.	Fabrication shall be with inert gas continuous wire feed welders only. The use of stick type welding is not acceptable on body due to heat distortion.			
63.5.	The entire body shall be of welded construction. The use of pop rivets in any portion of the construction of the vehicle will not be acceptable; this includes body sheet metal, inner pans of compartment doors, or any other portions of the body. Stainless steel bolts, nuts and stainless-steel sheet metal screws shall be used in mounting the exterior trim, hardware, or equipment. Dissimilar metals shall not come in immediate contact with each other to prevent corrosion and galvanic reaction.			
64.	**BODY STRUCTURE**			
64.1.	The aluminum body shall be designed for fire and rescue service operations. Commercially designed bodies intended for use in other applications are not acceptable due to lower levels of quality, construction,			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	and longevity. The body module shall utilize a fully welded sub-frame, separate from the chassis, incorporated into the welded body under the structure.			
64.2.	The complete body shall be formed and welded, built with 5052H32 marine grade 0.188" (3/16") aluminum, with 0.125" (1/8") non-slip polished aluminum checker plate overlays.			
64.3.	All exterior lower compartments and walls shall have fully welded seams with all upper walls, compartments, and interior dividers having stitch welding every 6" minimum. All welding and sheet metal fabrication shall be completed with the highest degree of quality and precision. All welds and seams shall be caulked and sealed with permanent pliable silicone.			
64.4.	Strict attention shall be given to the elimination of hazards to personnel and equipment, such as rough edges, sharp corners, or protruding nuts and bolts. All exposed welded corners on aluminum checker plate shall be polished to a bright finish. All exposed sharp corners shall be radiused and deburred. All structural seams shall be fully seam welded. All other body seams and shall be welded on 6" centers and then silicone caulked prior to painting.			
64.5.	Due to the engineered combination of specifically chosen materials, no dissimilar metals shall be used in the body and its supporting substructure without being separated by a sufficient corrosion and electrolysis inhibitor. All holes shall be drilled prior to painting. Any holes drilled after painting which break the paint seal shall be treated as dissimilar metal and shall be suitably separated. This shall consist of isolation pads, ECK, and other structural adhesives.			
64.6.	The body shall be completely modular in design, thereby allowing its transfer to a new chassis without cutting or welding in the event of an accident or the replacement of the chassis. The apparatus body shall be form built and building a body directly on the chassis shall be not required or permitted.			
64.7.	The body and tank shall be supported with over the frame cross tubing. These tubes shall be aluminum extrusions with a minimum dimension of 2" x 3" x 0.250" thickness. The exterior side compartments shall have an aluminum angle welded to cross channels and rear compartment walls. The front to rear angle shall be a minimum of 3.5" x 5" x .375" thickness extrusion.			
64.8.	The compartment floors shall be 0.188" aluminum and shall be sweep out construction design, which shall permit easy cleaning of the compartments. The outer flange of the compartment floors shall be fabricated to form a mounting area of exterior rub rails. This flange			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	shall be a minimum of 3.5" vertical dimension, full width of the compartment floor.			
64.9.	The front entrance to the compartment shall have a 2" deep x 1" high recess break for mounting of compartment doors.			
64.10.	Each compartment shall include one (1) 4" circular vent with screen.			
64.11.	Each compartment shall be finished with a full height Unistrut channel. All full-depth compartments shall include two (2) channels on the left wall and two (2) channels on the right-side wall. All half depth compartments shall include one (1) channel on the left wall and one (1) on the right-side wall.			
64.12.	Each compartment shall include a drain hole in the left and right rear corners to allow wash-out and water drainage.			
64.13.	The front face of the body shall be finished with a 0.125" aluminum checker plate overlay. The rear of the body shall be unpainted smooth aluminum covered by ULC and NFPA required reflective chevrons.			
64.14.	The top of the storage compartments shall be 0.125" non-slip NFPA aluminum checker plate and shall be bolted to the body with stainless steel bolts.			
64.15.	The body shall be mounted to the chassis frame with floating spring attachment mounts and ridged mounts. These spring mounts shall allow the chassis to twist and bend independently from the body and shall prolong the structural life of the body. This combination of mounts shall be installed as per the chassis manufacturer recommendations.			
64.16.	All mounts to the chassis frame shall have rubber block isolators to permit movement of the chassis frame under the apparatus body.			
64.17.	The body shall be grounded to the chassis frame with a minimum of two (2) body ground straps mounted metal to metal contact and coated with dielectric grease.			
65.	**REAR WHEEL WELLS**			
65.1.	The outer wheel well fenders and wheel well liners shall be integral to the compartments and constructed of 0.188" smooth aluminum. Both shall be painted red and the wheel well liners covered with black gravel guard.			
66.	**LEFT-SIDE BODY COMPARTMENTS**			
66.1.	Compartment L1 The compartment dimensions shall be approximately 54" wide by 28” deep by 63" high.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	This compartment shall include: • Two (2) full depth adjustable shelves • One (1) drawer assembly with 4 drawers • One (1) Battery box with top tray • One (1) 2000W Xantrex inverter/charger • One (1) 120V receptacle • One (1) hose roll divider for two rolls of hose.			
66.2.	Compartment L2 The compartment dimensions shall be approximately 65" wide by 28” deep by 28" high. This compartment shall include: • One (1) tilt down adjustable shelf • One (1) 120V receptacle.			
66.3.	Compartment L3 The compartment dimensions shall be approximately 45" wide by 28” deep by 63" high. This compartment shall include: • Two (2) full depth adjustable shelves • One (1) 120V receptacle • One (1) full depth pull out tray.			
67.	**RIGHT-SIDE BODY COMPARTMENTS**			
67.1.	Compartment R1 The compartment dimensions shall be approximately 54" wide by 28” deep by 63" high. This compartment shall include: • One (1) full depth fixed shelf • One (1) drawer assembly with 4 drawers • Two (2) pull out vertical tool storage boards with eight (8) SCBA brackets • One (1) full depth adjustable shelf • One (1) 120V receptacle			
67.2.	Compartment R2 The compartment dimensions shall be approximately 65" wide by 28” deep by 28" high. This compartment shall include: • One (1) rear wall Battleboard tool board • One (1) swing out Battleboard tool board.			
67.3.	Compartment R3 The compartment dimensions shall be approximately 45" wide by 28” deep by 63" high.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	This compartment shall include: • One (1) full depth adjustable shelf • One (1) full depth fixed shelf • One (1) 120V receptacle • Four (4) SCBA storage tubes.			
68.	**REAR BODY COMPARTMENT**			
68.1.	Compartment B1 The compartment dimensions shall be approximately 35" wide by 32” deep by 26" high. This compartment shall include: • One (1) full depth pull out tray • One (1) 120V receptacle.			
69.	**ROLL-UP STYLE - COMPARTMENT DOORS**			
69.1.	Compartments shall be equipped with Amdor brand roll-up anodized aluminum doors complete with the following features: • Amdor Luma Bar LED strip lighting, integral to the door frame on both sides of the door • 1” aluminum double wall slats with continuous ball & socket hinge joint designed to prevent water ingression and weather tight recessed dual durometer seals • A double wall reinforced bottom panel with stainless steel lift bar latching system • bottom panel flange with cut-outs for ease of access with gloved hands, reusable slat shoes with positive snap-lock securement • smooth interior door curtain to prevent equipment hang-ups • one-piece aluminum door track / side frame • top gutter with non-marring seal • non-marring recessed side seals with UV stabilizers to prevent warping • dual leg bottom seal, with all wear component material to be Type 6 Nylon • A door ajar switch system shall be provided by Amdor and shall include magnetic proximity-based components. The switch device shall be a military grade contact switch capable of meeting MIL-S-8805 which can only be activated through positive engagement of the lift bar. The door			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	striker will include support beneath the lift bar to prevent door curtain bounce.			
70.	**COMPARTMENTS SHELVING**			
70.1.	There shall be adjustable shelves provided, constructed of 0.188” 5052 H32 marine grade aluminum. The shelves shall have 2" edges on all sides of the shelf, with fully welded corners.			
70.2.	The shelves shall include heavy-duty mounts and be capable of a minimum 500 pounds load capacity.			
70.3.	All shelves shall be unpainted aluminum.			
71.	**ROLL-OUT TRAYS**			
71.1.	There shall roll-out trays provided, constructed of 0.188” 5052 H32 marine grade aluminum. The trays have 2" edges on all sides of the shelf, with fully welded corners. The trays shall include sliding aluminum mechanisms, 3 stage 100% extension with a 500lb. capacity.			
71.2.	All trays shall be unpainted aluminum.			
71.3.	All trays shall include red and lime reflective tape on all sections of the tray that protrude from the side of the apparatus body.			
72.	**HARD SUCTION HOSE STORAGE**			
72.1.	There shall be two (2) 6” hard suction hose storage compartments on the rear of the truck. One (1) each side above the side compartments.			
73.	**PIKE POLL STORAGE**			
73.1.	There shall be a pike pole storage for eight (8) pike poles. Four (4) each side above the hard suction hose storage compartments.			
74.	**SCBA CYLINDER STORAGE**			
74.1.	There shall be four (8) SCBA cylinder storage provided.			
74.2.	The SCBA cylinder storage shall comprise of black Polyarmor painted aluminum tubes with a aluminum painted to match the body, double door with rubber gasket, with nylon straps to secure the cylinders. There shall be accommodation for the following: • Two (2) SCBA bottle in the left forward wheel well, driver side. • Two (2) SCBA bottle in the left rear wheel well driver side. • Two (2) SCBA bottle in the right forward wheel well passenger side.			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	• Two (2) SCBA bottle in the right rear wheel well passenger side.			
75.	**REAR FOLDING LADDER**			
75.1.	An aluminum folding ladder will be installed on the rear driver side of the apparatus. The ladder will fold in the stowed position allowing sufficient space for the quick-dump chute to rotate 180 degrees.			
76.	**TAILBOARD**			
76.1.	A bolt on DIAMOND BACK tailboard shall be installed on the rear of the apparatus spaced out from the body to provide drainage. The step shall be bolted to the body frame and finished with safety grip or similar material to provide a durable anti-slip surface. The tailboard shall extend across the full width of the vehicle and shall extend out from the body sufficiently for standing while loading the hose.			
77.	**HANDRAILS**			
77.1.	Aluminum handrails with knurled finish shall be installed on the rear of the apparatus, tank and pump panel area as required to provide for three (3) point contact when climbing or mounting the tailboard and climbing onto the hose bed.			
78.	**RUB RAIL**			
78.1.	Aluminum “C” channel rub rails shall be installed along the full length of the body. The rub rails shall be bolted on the exterior edge of the compartment floors, spaced from the body.			
78.2.	The rub rails shall extend to a minimum of 1" from compartment doors.			
79.	**TOW EYES**			
79.1.	Two (2) screw-in drop forged tow eyes or brackets shall be installed on the apparatus. Tow eyes or brackets shall be secured directly to the rear of chassis frame.			
80.	**REAR WHEEL FENDERETTES**			
80.1.	Polished stainless steel fenderettes shall be bolted at each rear wheel opening. The fenderettes shall be positioned outside of the wheel well panel to cover any tire area that extends past the body.			
81.	**COMPARTMENT FLOORING**			
81.1.	There shall be black PVC Turtle Tile protective flooring provided. The following locations shall include the flooring:			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	• All adjustable shelves • All roll-out trays			
82.	**MUD FLAPS**			
82.1.	Mud flaps shall be installed behind the rear wheels to protect the body and components from road spray.			
83.	**LICENSE PLATE HOLDER**			
83.1.	There shall be one (1) Cast Products Inc. LP-0005-1-A polished cast aluminum license plate holder with LED light mounted at the rear of the apparatus.			
	ELECTRICAL			
84.	**ELECTRICAL SYSTEMS**			
84.1.	Shall be a 12-volt electrical system (NFPA 1901- Most Current Edition Standards.)			
84.2.	All wiring shall be of the design type GXL and size appropriate for the anticipated circuit loads.			
84.3.	All wiring shall be protected from heat and physical damage. Wiring shall be colour coded and labelled on the insulation every 4" minimum. Wires outside of the cab or body shall be in loom and coded.			
84.4.	All terminals shall be crimping type, with insulated shanks or stud type bolted. Deutsch connectors or equivalent shall be utilized where possible.			
84.5.	All terminals and components in exposed areas shall be protected from the elements. Exposed area is defined as any area outside of the cab or body. Deutsch connectors shall be utilized on all outside connections.			
84.6.	The entire body and chassis electrical system shall be protected by automatic re-settable circuit breakers or fuses. Load does not exceed 80% of breaker or circuit ratings.			
84.7.	Lighted rocker type switches shall be used in the cab area to indicate when the switch is in the “on” position.			
84.8.	A master battery disconnect switch shall be used to activate the system and provide power to the power panel. A green pilot light (Battery on) shall illuminate to indicate that the battery bank is activated.			
84.9.	Individual body components such as the cab and compartments shall be grounded to each side of the frame with grounding cables.			
85.	**CENTER CONSOLE**			
85.1.	A center console equipment box shall be installed inside the cab. Centre console shall be constructed of			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	1/8"aluminum. The console shall be Poly Armour painted black.			
86.	**DOOR AJAR**			
86.1.	Compartment door “ajar” warning light and buzzer shall be installed according to most current NFPA 1901 requirements.			
87.	**CHARGER, COMPRESSOR AND SHORELINE POWER**			
87.1.	A Xantrex Freedom X 2000W inverter charger shall be installed inside the L-1 compartment and connected to the shoreline power receptacle. The unit will supply power to all receptacles when plugged into shore power and when truck engine is operating.			
87.2.	A Kussmaul Super 20 Auto Eject and Charger Status Bar Graph Display Model #091-055-51266-YW shall be mounted on the pump panel to provide 120-volt shoreline power to the battery charger, one (1) 120-volt power outlet in cab and the power outlet(s) in body compartment(s). The receptacle shall be in a conspicuous location visible to the driver when entering the cab.			
87.3.	A Kussmaul air compressor Model #091-9HP 120 volts shall be mounted inside the pump module. Power for the compressor shall be provided from the Auto Eject shore power.			
88.	**MOBILE RADIO REQUIREMENTS**			
88.1.	The center console will have radio previsions as follows. • Fused 12-volt master switched power • Fused 12-volt ignition switched power • Ground bus bar connection point			
88.2.	The vehicle shall be adequately radio interference suppressed to permit understandable voice radio communications under all operating conditions.			
88.3.	An antenna base, for use with an NMO type antenna, shall be mounted centered on the cab roof so not to interfere with light bars or other roof mounted equipment.			
88.4.	The antenna cable shall be routed from the antenna base mounted on the roof to the area inside the center of the console.			
89.	**OPTICAL WARNING SYSTEM AND LIGHTING**			
89.1.	Optical Warning System and Lighting shall comply with NFPA Standard 1901 Most Current Edition. Certification that the system has been installed within the geometric			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	parameters shall be provided with the apparatus on delivery.			
89.2.	Emergency lighting control panel/switches to be mounted on the top of the center console.			
89.3.	The electrical body system shall be a Whelen multiplex system.			
89.4.	A Whelen WCX Cencom Core #CCTL6 controller shall be installed in center console.			
89.5.	One (1) 100-watt Whelen siren speaker shall be flush mounted in front left section of the bumper.			
89.6.	A Federal signal Q2B siren shall be flush mounted on the left side of the bumper. Siren shall be activated by a push button in the center console for the Q2B break accessible to the driver and officer.			
89.7.	A Whelen projector series speaker shall be installed on the right side of the bumper. The control of the speaker shall be part of the siren and light control system.			
89.8.	A Whelen NFPA 72″ Freedom lightbar clear lens configured with white, red, and blue LED lights installed on the roof of the cab.			
89.9.	When the parking brake is applied all white warning lights shall be deactivated in the light bar.			
89.10.	Two (2) Whelen M Series - one (1) Model # M6RC and one (1) Model # M6BC LED warning lights with clear lenses and chrome bezel Model # M6FC shall be installed on the front grill.			
89.11.	Two (2) Whelen M Series - one (1) Model # M6RC and one (1) Model # M6BC LED warning lights with clear lenses and chrome bezel Model # M6FC shall be installed forward of the front axle centerline and as close to the front corner of the apparatus as practical.			
89.12.	Two (2) Whelen M Series - one (1) Model # M6RC and one (1) Model # M6BC LED warning lights with clear lenses and chrome bezel Model # M6FC shall be installed forward of the rear axle centerline.			
89.13.	Two (2) Whelen M Series - one (1) Model # M6RC and one (1) Model # M6BC LED warning lights with clear lenses and chrome bezel Model # M6FC shall be installed behind the rear axle centerline and as close to the rear corner of the apparatus as practical.			
89.14.	Two (2) Whelen M Series - one (1) Model # M6RC and one (1) Model # M6BC LED warning lights with clear lenses shall be installed behind in the rear facing brake lights clusters provided on the rear of the body.			
90.	**COMBINATION WARNING AND SCENE LIGHT**			
90.1.	Two (2) Whelen M Series - one (1) Model # M9V2RC			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	and one (1) Model # M9V2BC combination 180° warning/perimeter light with chrome bezel Model # M9FC shall be installed at the most forward point of the body side as high as possible.			
90.2.	Two (2) Whelen M Series - one (1) Model # M9V2RC and one (1) Model # M9V2BC combination 180° warning/perimeter light and chrome bezel Model # M9FC shall be installed at the most rear point of the body side, as high as possible.			
90.3.	Two (2) Whelen M Series - one (1) Model # M9V2RC and one (1) Mode l# M9V2BC combination 180° warning/perimeter light and chrome bezel Model # M9FC shall be installed at the back of the body as high as possible, in each corner.			
90.4.	The rear scene lights shall come on when the truck is put in reverse.			
91.	**SCENE LIGHTING**			
91.1.	One (1) Whelen Pioneer Summit 44 inch brow light will be installed under the light bar.			
91.2.	Two (2) Whelen Dual Panel Pioneer Plus #PCPSM2C Lights shall be installed at the center of the body as high as possible. One each side of the body.			
91.3.	Two (2) Whelen Pioneer Summit nine (9) inch flood light bars will be installed at the rear of the body facing rearward. One (1) each side on top of the hard suction hose compartments.			
91.4.	The lights will be controlled on the Cencom Core controller and an auxiliary switch panel on the pump house.			
92.	**BRAKE LIGHT CLUSTER**			
92.1.	There shall be two (2) rear facing brake like clusters provided on the rear of the body. Each cluster shall include the following: • One (1) C62BTT red Whelen LED brake/taillight. • One (1) C62T amber Whelen LED arrow turn indicator. • One (1) C62BU white Whelen LED back-up light. • One (1) open location for warning lights (M6RC or M6BC). • One (1) M6FCV4 chrome plated Whelen bezel.			
93.	**TRAFFIC ADVISOR**			
93.1.	Whelen Traffic Advisor™ model # TAL65 shall be installed at rear of the apparatus as high as possible. The controls for the TAL65 shall be mounted in the			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	center console. The directional light bar shall have a protective cover to protect it from objects coming from the hose bed.			
94.	**GROUND LIGHTS**			
94.1.	Amdor Luma Bar H2O (High Output) led lights shall be installed on the apparatus. • Two (2) twelve-inch H2O shall be installed under chassis steps. One (1) on each side. • Two (2) twelve-inch H2O shall be installed under pump module. One (1) each side. • Four (4) twelve-inch H2O shall be installed, one (1) under each compartment (L1, L3, R1, R3). • Two (2) twenty-inch H2O shall be installed under the rear tailboard. The lights shall be mounted to prevent accidental breakage. The lights shall be activated automatically when the parking brake is applied. Individual switch(s) shall not be installed. This shall be deemed to meet the individual door switching requirements of NFPA 1901-Most Current edition.			
95.	**CHASSIS STEP LIGHT**			
95.1.	Four (4) TecNiq LED step light part #D07 shall be installed under the chassis to illuminate the top step. Two (2) each side.			
95.2.	Four (4) TecNiq LED step light part #D07 shall be installed under the chassis to illuminate the first step. Two (2) each side.			
95.3.	Two (2) TecNiq LED step light part #D07 shall be installed between the rear ladder steps.			
95.4.	The lights shall be activated automatically when the parking brake is applied. Individual switch(s) shall not be installed. This shall be deemed to meet the individual door switching requirements of NFPA 1901-Most Current edition.			
96.	**COMPARTMENT LIGHTING**			
96.1.	Four (4) compartments, each with two (2) Amdor Luma Bar LED lights, integral to door construction shall be installed.			
96.2.	The door switches shall be magnetic, switches shall be protected from physical damage and activate a light in the cab to indicate compartment door open condition. When the parking brake is released, the light will flash, and an audible alarm will sound. This shall be deemed			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	to meet the individual door switching requirements of NFPA 1901- Most Current edition.			
96.3.	The compartment lighting shall be activated by opening the roll up doors.			
97.	**HOSEBED LIGHTING**			
97.1.	There shall be lights provided to illuminate the hose bed for nighttime hose loading. The following lights shall be supplied: • Two (2) Amdor 40” Luma Bar H2O (High Output) LED lights on the inside of each of the hard covers for a total of four (4) lights. • One (1) Amdor 12” Luma Bar H2O (High Output) LED light will be installed in the front hose bed donnage. The lights shall be activated automatically when the parking brake is applied. This shall be deemed to meet the individual door switching requirements of NFPA 1901- Most Current edition.			
98.	**ENGINE COMPARTMENT LIGHTING**			
98.1.	One (1) twelve-inch Amdor Luma Bar H2O (High Output) LED light shall be installed under the chassis hood to illuminate the engine. The lights shall be activated automatically when the parking brake is applied. Individual switch(s) shall not be installed. This shall be deemed to meet the individual door switching requirements of NFPA 1901- Most Current edition.			
99.	**PUMP COMPARTMENT LIGHTS**			
99.1.	One (1) twelve-inch Amdor Luma Bar H20 LED (High Output) light shall be installed in the pump compartments. The light shall activate with a switch located on the pump panel.			
100.	**SIDE TURN/MARKER LIGHTS**			
100.1.	The sides of the body shall include two (2) Weldon part # 9186-8580-29 LED round turn signal /side marker lights shall be installed in front of rear axle.			
101.	**BODY CLEARANCE LIGHTS**			
101.1.	LED identification lights and reflectors shall conform to Canadian Motor Vehicle Safety Standards as well as Ontario Ministry of Transportation standards. The red and amber light shall be made by TecNiq and the part number is S33-RR-OP-01 and S33-AA-OP-01. All lower identification lighting shall be located within the rub rails			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	for protection.			
102.	**CAMERA SYSTEM**			
102.1.	There shall be a Fire Research inView™ TrueSight™ model BCA111-A00 kit to include: • One (1) 130° camera with 18 infrared illuminators. • One (1) 7" digital monitor. Camera shall be located at the rear of apparatus as high as possible The 7" colour screens and controls shall be located inside the cab on the driver side.			
	FINISHING			
103.	**PAINT WARRANTY**			
103.1.	The cab and chassis shall be covered by a limited manufacturer paint warranty which shall be in effect for ten (10) years from the first owner's date of purchase or in service or the first 100,000 actual kilometers, whichever occurs first.			
104.	**CHASSIS**			
104.1.	The chassis shall be painted during factory construction. Colour is to be chosen during the Pre-Construction meeting.			
105.	**BODY**			
105.1.	The aluminum body exterior shall have all mounted components removed prior to painting, to ensure the full coverage of metal preparations. The body shall be painted to match the chassis.			
105.2.	All roll up doors and accessories shall be installed after painting to assure the proper paint coverage of the body.			
105.3.	The metal surface shall be sanded to remove all burs and imperfections in the aluminum before preparation for painting.			
105.4.	The metal surface shall be cleaned and prepped with solvent and washed with fresh water to remove oxidization and other surface contaminants, to give a bright, conditioned and chemically etched surface for finishing. The aluminum surface shall be conditioned with a conversion chemical treatment and washed with fresh water to produce a corrosion resisting			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	conversion coating, to prevent oxidization and other surface contaminants, leaving a surface that allows excellent paint adhesion.			
105.5.	The aluminum surface shall have a spray on, wash primer, to seal and provide a smooth surface for final coats.			
105.6.	The aluminum body shall be painted with a high luster urethane paint to match the chassis red from the factory.			
106.	**FIRE DEPARTMENT GRAPHICS – FULL PACKAGE**			
106.1.	All graphics shall be applied prior to apparatus delivery. A graphics layout must be provided prior to application to confirm accuracy and signed off by the fire department. Failure to do this is grounds for rejection if the graphics package is incorrect. The following shall be supplied: • Up to 1”x 4” x 1” white reflective stripe along the perimeter of the apparatus. • Up to 100 x 4” or smaller white/black shadow reflective letters.			
107.	**REFLECTIVE CHEVRONS**			
107.1.	The rear wall of the body shall have red and fluo-lime retroreflective 6” chevrons installed as per the requirements of ULC and NFPA. The front bumper shall have red and fluo-lime retroreflective 6” chevrons installed.			
	EQUIPMENT			
108.	**LOOSE EQUIPMENT**			
108.1.	• One (1) set of Zico folding wheel chocks with mounting brackets. • One (1) ABC 5lbs fire extinguisher. • One (1) Truck first aid kit. • One (1) set of emergency triangles. • One (1) 24' 2-Section extension ladder. • One (1) 14' Roof ladder. • One (1) 10' Folding attic ladder. • Two (2) 6” 10’ Long handles hard suction hoses. • Two (2) sets of two (2) spanner wrenches with mounting brackets			

	EAST FERRIS FIRE DEPARTMENT PUMPER 1200 IGAL			NOTES
	• One (1) rubber mallet with mounting bracket • One (1) 4” 5’ hard suction hose with Storz • One (1) 4” low bottom strainer • Six (6) Streamlight Survivor flashlights (orange) with chargers • Two (2) Streamlight Vulcan flashlights (orange) with chargers • Two (2) 50’ 1.75” material (green) hose			
108.2.	All additional loose equipment that may be required by ULC or NFPA shall be provided by and installed by the fire department prior to apparatus entry into service. The fire department may be required to sign a waiver prior to the ULC test confirming they will be supplying the required equipment.			
109.	**END OF SPECIFICATIONS**			