

E.S. Fox Limited

Power Generation



560 MW Cogeneration Station

COMPANY CONTACT

E.S. Fox Limited — Power Generation

www.esfox.com

905-354-3700 x1210

HEAD OFFICE

P.O. Box 1010
9127 Montrose Road
Niagara Falls, Ontario L2E 7J9
TELEPHONE: 905-354-3700
WEBSITE: www.esfox.com



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OSHAWA



Founder - Edward (Ted) Fox

E.S. Fox Limited

CORPORATE OVERVIEW

Since 1934, E.S. Fox Limited (ESFL) has set the standard for safety and quality in the fabrication and construction industry. ESFL, a privately owned, Canadian, multi-trade company, providing a single source for Industrial, Institutional, Commercial, and Power Generation projects. With over 3.0 million direct-hire man-hours last year, we self-perform Structural Steel Fabrication and Erection, Mechanical, Electrical, Sheet Metal, HVAC, Refrigeration, Millwright / Rigging, and Boiler Making.

The strength of our company stems from the vast experience of its people, the integration of a variety of skilled trades, and dedication to total control of construction through computerized planning and monitoring techniques.

ESFL has established a reputation for high quality workmanship, operational flexibility, efficiency, and timely project completion.

CONSTRUCTION CAPABILITIES

As a fully integrated, multi-trade construction firm, E.S. Fox Limited provides clients with a single source solution for their detail engineering, fabrication, construction, and maintenance needs. We are a solutions based provider that delivers a superior level of service from “cradle-to-grave,” as we offer multi-trade, service oriented solutions for all your ICI and Power Generation projects.

FABRICATION CAPABILITIES

E.S. Fox Limited is proud to operate three state-of-the-art fabrication facilities across Ontario. At our main fabrication facility in Port Robinson, we offer over 83,000 square feet of production space. We work to the highest standards to produce Pipe Spools, Modules, Cryogenic Cold Boxes, and Pressure Vessels. With over 800 weld procedures and 40 quality certifications including nuclear, E.S. Fox Limited continues to be a leader and a symbol of Canadian strength and tradition in the supply of Quality Fabrication Services for the Industrial, Commercial, Institutional, and Power generation markets for over eight decades.

SERVICES

- ENGINEERING
- FABRICATION
- STRUCTURAL DESIGN
- STRUCTURAL STEEL ERECTION
- BRIDGE ERECTION
- MILLWRIGHTING | RIGGING
- BOILERMAKING
- MECHANICAL SERVICES
- ELECTRICAL SERVICES
- SHEET METAL
- REFRIGERATION
- HVAC

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Environmental Health and Safety

SAFETY CULTURE

At ESFL, employee safety, protection of the environment, and work quality are the main focus of our safety culture. Both management and employees work together in an effort to further advance knowledge of safety and incident prevention. Together we work to ensure a safe work environment for all. Our employees believe in the fundamental principle that safety is everyone's responsibility.

One of our core values is to "Prevent the Event." Incident prevention is the integral part of every job with the safety and well-being of each individual the number one priority.

SAFETY PROGRAM KEY ELEMENTS

- Corporate Safety Manual
- Site Specific Safety Plans
- Orientation and Training
- Incident Investigation
- Lessons Learned Bulletins
- Job Safety Analysis
- Workplace Inspections
- Senior Management Review
- Safety First Attitude
- Trending and Analysis
- Setting Objectives and Targets
- Safety Workshops
- Mentoring Program
- J.H.S.C.
- Strong Communication
- Accountable Supervision
- Safety Meetings



International
Organization for
Standardization

ISO 45001:2018

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Quality Assurance



ISO	CSA	ASME
<ul style="list-style-type: none"> • ISO 9001:2015 • ISO 14001 • ISO 18001 	<ul style="list-style-type: none"> • CSA N285.0 Nuclear Class 1,2,3, & 4 Parts, Components & Support (Shop & Field) • CSA N285.0 Nuclear Material Supply Ferrous and Non-Ferrous (3 Locations) • CSA N286-12 Nuclear • CSA N299.1 – 2016 • CSA B51 Boiler, Pressure Vessels & Pressure Piping & Repairs (Shop & Field) • CSA B51 Category A, B, C, E & H Type Welded Non-Welded Fittings (Shop & Field) • CSA B51 Hot Tap & Line Stopping (Shop & Field) • CSA Z7396. 1-17 Medical Gas Pipeline Systems Part 1 	<ul style="list-style-type: none"> • National Board Registration for ASME Section III, R, VIII (Shop & Field) • ASME Section III, Division 1: N, NPT, NA, NS • ASME Section VIII, Division 1 & 2 Pressure Vessels (Shop & Field) • ASME U, U2, S, & PP Stamps (Shop & Field) • ASME U, UM Stamps: Edmonton Division (Shop & Field) • ASME B31.1 Power Piping (Shop & Field) • ASME B31.3 Process Piping (Shop & Field) • ASME B31.5 Refrigeration Piping (Shop & Field) • CSA B52 Mechanical Refrigeration Code
CWB		
Structural Steel CWB W47.1 Div. 1 Structural Aluminum CWB W47.2 Div. 1		



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Locations & Facilities

Head Office: Niagara Falls, ON —240,000 square feet

Branch Location	Capabilities		Square Footage
Darlington, ON	Construction		
Hamilton, ON	Construction	Fabrication	3,000 sq. ft.
Kingston, ON	Construction	Fabrication	17,000 sq. ft.
Port Robinson, ON		Fabrication	83,000 sq. ft.
Sudbury, ON	Construction		
Thunder Bay, ON	Construction	Fabrication	5,000 sq. ft.
Tiverton (Kincardine), ON	Construction		
Vaughan (Toronto), ON	Construction		
Oshawa, ON	Construction		
Total Fabrication			108,000 sq. ft.



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Capabilities

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We provide the following construction services:

- ◆ Piping
- ◆ Electrical
- ◆ Structural Steel
- ◆ Ironworkers
- ◆ Millwrights
- ◆ Boiler Making
- ◆ Sheet Metal
- ◆ HVAC
- ◆ Instrumentation & Controls
- ◆ Operating Engineering
- ◆ Insulation
- ◆ Carpenters
- ◆ Labourers
- ◆ Refrigeration



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FABRICATION CAPABILITIES

At our main fabrication facility in Port Robinson, Ontario, we offer over 83,000 square feet of production space. We work to the highest standards required to produce Cryogenic Cold Boxes, Pipe Spools, Modules, and Pressure Vessels. With more than 800 weld procedures, we fabricate:

Modules and Vessels

- ◆ Process Modules and Equipment Skids
- ◆ Cryogenic Air Distillation Columns for:
Oxygen, Nitrogen, and Argon
- ◆ Air Liquefaction / Separation
- ◆ Hydrogen Purification
- ◆ Catalyst Reclamation
- ◆ Oil/Water Purification

Pipe Fabrication

- ◆ Stand alone contracts & support of field projects and other fabrication projects
- ◆ Area of expertise is high alloy materials:
Stainless Steel, Aluminum, Titanium,
Chrome-Moly
- ◆ Carbon Steel up to 84" Diameter
- ◆ Victaulic—Roll Grooved Piping up to 48" Dia.
- ◆ Jacketed Pipe



Pressure Vessel



Cryogenic Cold Box

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PORT ROBINSON SHIPPING

We are unique in that we have access to the Welland Canal at our Port Robinson facility. This includes our own loading docks, where we can ship oversized modules from up to 800 tons to any water accessible location in the world.

Transportation Access & Dock Facilities

- ◆ 1/2 mile from Highway 406 extension providing direct access to Queen Elizabeth Highway
- ◆ 1/4 mile from Canadian National Railroad line
- ◆ Heavy Barge Roll On/Roll Off Loading Dock extending into the Welland Ship Canal turning basin providing 10' draught and 400 ton capacity
- ◆ Heavy Lift Dock of 800 ton capacity, dock face 475 ft. draught 25 ft. The dock can accommodate maximum Seaway length vessels
- ◆ The site incorporates 5 acres of level, well compacted, crushed stone assembly area



Cryogenic Cold Box - Port Robinson Loading Dock

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E.S. Fox Limited — Power Project Profile



Oxy Vinyls — New Cogeneration Plant

Client

SNC Lavalin Inc.

Scope

- One gas turbine generator unit of 5.7 MW nominal output, complete with excitation systems & other ancillary systems & equipment
- The GTG package was supplied in an enclosure with various shipped loose components, all to be installed by E.S. Fox Limited
- One heat recovery steam generator, requiring assembly & installation of various shipped loose components
- One condensing economizer requiring assembly & installation of various loose components
- 4160V generator switchgear in electrical room
- 115kV PTs to be installed in the HV2 outdoor substation

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E.S. Fox Limited — Power Project Profile



Portlands Power Generation Centre—550 MW Combined Cycle Facility

Client

SNC Lavalin Inc.

Scope

E.S. Fox Limited performed the all-trades installation of two GE Frame 7FA Gas Turbines rated at 180 MW each, two DLN Combustion Turbines, all associated equipment, electrical and piping as well as the offsite assembly, transportation, and erection of tow 20' diameter by-pass stacks. The scope of work included:

- Transporting and setting of GE 7FA Gas Turbine Generators
- Exhaust Diffusers
- Exhaust Ducts c/w Air Inlet Filter Houses
- Filter House Structural Steel
- Ducting
- Accessory Modules
- LEC Modules
- LCI Modules
- Turbine Enclosures
- Piping and Supports, Tubing and Supports, Valves, other specialty equipment
- Supply and install all cable tray, conduit, supports and accessories necessary

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E.S. Fox Limited — Power Project Profile



640 MW Cogeneration Plant

Client	TransCanada Pipelines
Scope	<ul style="list-style-type: none">• Supplied and erected 1500 Tons of Structural Steel• Field installed two Alstom HRSG's• Associated piping and electrical work for ten process modules• Assembled modules at our main yard and dock facility in Port Robinson• Shipped job to site for final assembly by ESFL
Trades	Ironworkers Sheet Metal

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E.S. Fox Limited — Power Project Profile



Goreway Power Station

Client

SNC Lavalin

Scope

E.S. Fox Limited's scope of work encompassed the all-trades installation of one Siemens Steam Turbine rated at 300 MW and all associated equipment, electrical, and piping. The scope of work included:

- Establishing datum and elevation lines
- Foundation preparation
- Setting of generator and alignment, and coordination with heavy hauling subcontractor
- Installation and connection to condenser
- Assembly and installation of 4 main steam valves
- Installation of on-board turbine piping
- Installation of seal, steam, gland condenser, hogger ejector skids and accessory equipment
- Installation of piping, supports, valves, and specifically equipment associated with the STG
- Installation of instrumentation
- Installation of cable, trays, generator termination, neutral grounding supports
- Pre-commissioning activities

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ET Clarke Cogeneration System Installation

Client

McMaster University

Scope

E.S. Fox Limited was the General Contractor for the Cogeneration System Installation. This scope included retrofitting of the existing boiler plant, with existing foundations of the boiler room to be upgraded. Installation of a new gas turbine generator, heat recovery steam generator, high voltage electrical upgrades, installation of a gas compressor, absorption chiller, centrifugal chiller as well as the modification of the building envelope.

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Magnolia—The Grange—Micro-Turbine Installation

Client

Magnolia Generation

Scope

- Design/Build project within existing operational High Rise Residence
- Installation of four 65kW micro-turbines exhausting into two heat recovery boilers
- Acted as the Prime to the owner in a CCDC2 Contract 4,000 hour job
- Installation of four new 65kW National Gas Micro-Turbines and all associated instrumentation systems dependent for these engines
- Pumps, heat exchangers, piping etc, along with process instrumentation for the new heat recovery portion of the job
- Installation of necessary switchgear, panels, transformers, wiring etc., for the project

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Markham District Energy— Birchmount & Bur Oak Electrical

Client

Markham District Energy

Scope

- Installation of two new 5kV Natural Gas Generators (3 MW and 4 MW) and all associated Instrumentation & Control systems for the engines
- Installation of process instrumentation for new Heat Recovery system
- Modifications to existing equipment and installation of owner supplied 5kV equipment
- Supply and install new 600V and 208V Distribution equipment
- Installation of three new 5kV Switch Gear Cells at Birchmount and four new cells at Bur Oak
- New 600V and 208V systems at both sites

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E.S. Fox Limited — Power Project Profile



Queen's University—15 MW Cogeneration Facility

Client

Queen's University

Scope

- The project consisted of the installation of a 15 MW cogeneration facility within an existing operational Central Heating Plant
- This was a Design-Build project with E.S. Fox Limited responsible for all aspects of the plant construction
- This project was based on the installation of two 7 MW Solar Taurus 70 combustion gas turbines exhausting into two heat recovery boilers each rated at 75,000 PPH with supplemental duct burners
- The boilers included economizers and isolation dampers with seal air fan. These units feed into the existing steam distribution system. In total, 30 tie-ins were made to existing plant systems

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