In-Building Storage Tank - Supplying Appliances Requirements Check Sheet

STORAGE TANK PERMIT

Div C, 2.2.3.1.(5)

No person shall install, remove, alter or repair any part of a storage tank system unless a storage tank permit has been obtained from Edmonton Fire Rescue Services.

Permit Requirements:

1) A detailed scope of work.
2) All installations, removals, repairs or replacements of any storage tank system, in whole or in part, must meet all requirements of the NFC(AE).
3) The name and certification number of the individual that will be on site during the proposed scope of work must be included in the storage tank permit application.
4) All relevant documents must be included with the storage tank permit application, including but not limited to storage tank specification sheets, site maps with clearances, engineered drawings, applications for variance where applicable, etc.
5) Engineered drawings that bear the stamp and seal of a licensed engineering professional registered to practice in Alberta are required if any of the following apply:
    a) Any underground installation/repair of a storage tank system in part or in whole, including tank(s), lines, etc.
    b) Any in-building installation/repair of a storage tank system in part or in whole, including tank(s), lines, pumps, catch basins, etc.
    c) Any installation/repair of an aboveground storage tank system where an individual tank exceeds 8,000 L or the aggregate capacity of all tanks exceeds 20,000 L.

***Permits will only be issued by the reviewing Fire Safety Codes Officer with Edmonton Fire Rescue Services if all required information and documents are provided and the proposed scope of work in its entirety meets the requirements of the National Fire Code - 2023 Alberta Edition [NFC(AE)] Any permit application that is incomplete or missing the required information and documents may be subject to cancellation or refusal.**

CERTIFIED PETROLEUM MECHANIC

Div C, 2.2.3.1

1) Only individuals approved by the Provincial Fire Administrator are permitted to install, remove, repair or maintain aboveground or underground storage tank systems.
2) Approved persons are considered qualified to install, remove, repair and maintain aboveground and ,underground storage tank systems when they have received certification from
    a) The Canadian Petroleum Contractors Association (CPCA),
    b) The Technical Standards and Safety Authority (TSSA), and
    c) The Petroleum Tank Management Association of Alberta (PTMAA) (*see Note A-2.2.3.1.(2)(c)*)

Note A-2.2.3.2.(2)(c). - PTMAA certification will no longer be recognized after December 31, 2025. Anyone who has certification through PTMAA will need to gain their certification through the CPCA or TSSA before December 31, 2025.

STORAGE TANK REGISTRATION

Aboveground storage tanks with a capacity greater than or equal to 2,500 Litres and all underground storage tanks must be registered annually with Edmonton Fire Rescue Services.

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The information below lists the most common requirements related to in-building flammable liquid and combustible liquid storage tank systems. **Include all applicable information listed below in your documentation as well as any other applicable code requirements not listed below and refer to the National Fire Code - 2023 Alberta Edition or CSA B139 - Series 19 to ensure all code requirements have been met.**

STORAGE TANK SYSTEMS SUPPLYING APPLIANCES

APPLIANCES
Appliances means a device to convert fuel into energy. Storage tanks can be used to supply fuel to oil-burning equipment and diesel-engine driven equipment such as emergency generators and fire pumps.

IN-BUILDING STORAGE TANKS SUPPLYING APPLIANCES	
☐ Storage tank systems that are supplying an appliance and their ancillary equipment with a volume **less than or equal to 2,500 L** have been installed as per **CSA B139 - Series 19**	**See Section 1**
☐ Storage tank systems that are supplying an appliance and their ancillary equipment with a volume **more than 2,500 L** have been installed as per **Part 4, NFC(AE)**.	**See Section 2**

SECTION 1 - LESS THAN OR EQUAL TO 2,500 L

IN-BUILDING STORAGE TANKS <2,500 L SUPPLYING APPLIANCES

This section is in compliance with **CSA B139.1.1:19** code for storage tanks with volumes equal to or less than 2,500 L installed inside buildings and fueling stationary engines.

CONSTRUCTION

CSA B139.1.1:19 - 4.3.2.

Supply tanks or auxiliary tanks provided as part of an appliance shall comply with 6.2.1. of CSA B139.1.0.

CSA B139.1.0:19 - 6.2.1.1.

- ☐ When installed in a building, supply tanks and storage tanks shall be constructed in accordance with 6.2.1.2.

CSA B139.1.0:19 - 6.2.1.2.

- ☐ Tank shall comply with one or more of the following ULC standards:
  - ☐ CAN/ULC S601;
  - ☐ CAN/ULC S602;
  - ☐ CAN/ULC S652;
  - ☐ CAN/ULC S653
  - ☐ CAN/ULC S655;
  - ☐ CAN/ULC S670 (**Superseded by ANSI/CAN/ULC/UL 2258**); or
  - ☐ CAN/ULC S677;
- ☐ Be designed and constructed in conformance with ASME or CSA B51;
- ☐ API 650 for tanks exceeding 175,000 L

CSA B139.1.0:19 - 6.2.3.2.1.

- ☐ Horizontal clearance from tank to appliance must be at least 0.6 m or 2 ft except where the storage tank is an integral part of the appliance (belly tank).
- ☐ When the clearance above is impractical, the distance may be decreased by providing a shield between tank and appliance that has a minimum fire rating of 1 hr and completely shields the tank from the appliance by exceeding the height and width of the tank.

SUPPORT, INSTALLATION, FOUNDATIONS, AND ANCHORAGE

CSA B139.1.1:19 - 4.3.2.

Engine supply tank supports shall comply with the requirements of Clause 6.3.3. of CSA B139.1.0.

CSA B139.1.0:19 - 6.3.3.

- ☐ A tank shall be supported on rigid non-combustible supports.
- ☐ Where the tank will be supported greater than 300 mm from the adjacent floor shall have a fire-resistance rating of not less than 2 hrs.

CSA B139.1.0:19 - 6.3.7.

A tank shall be installed:

- ☐ To permit the installation and maintenance of shut-off valves, filters, and associated fittings.
- ☐ So that the certification label is clearly visible after installation
- ☐ So that, if installed on a double walled tank, the vacuum gauge is clearly visible after installation.

PIPING AND TUBING

CSA B139.1.0:19 - 5.2.1.1.

- ☐ Fuel oil piping shall be installed in accordance with
  - ☐ ASME B31.1;
  - ☐ ASME B31.3; or
  - ☐ ASME B31.9

CSA B139.1.0:19 - 5.2.1.4.

- ☐ Fill and vent pipes for supply and storage tanks shall be of steel, stainless steel or galvanized construction.

CSA B139.1.0:19 - 5.2.1.6.

- ☐ A flexible connection may be used at the appliance where rigid connection is impractical and shall:
  - ☐ Conform to ULC/ORD C536 or CAN/ULC S633
  - ☐ Not exceed 1.5 m (60 in) in length; and
  - ☐ Be installed in accordance with manufacturer requirements

CSA B139.1.0:19 - 5.2.1.16.

- ☐ Piping and tubing shall not be installed in chimneys, vents, elevator shafts, dumbwaiters,chutes, air distribution ducts, or duct shafts used as return air plenums.

  Note - Fuel supply piping and tubing may be installed in vertical service spaces including those that contain ducting.

CSA B139.1.0:19 - 5.2.1.12.

- ☐ Piping or tubing shall be sleeved or double wrapped with a pipe wrap tape where the piping passes through:
  - ☐ An exterior wall above ground;
  - ☐ An interior wall of masonry or concrete construction; or
  - ☐ Horizontal masonry, concrete, or asphalt material installed at grade level.

PIPING JOINTS AND CONNECTIONS

CSA B139.1.0:19 - 5.2.2.1

- ☐ Piping and tubing joints and connections shall be made in accordance with the following:
  - ☐ Made fuel oil tight;
  - ☐ Standard threaded pipe fittings of iron, brass or stainless steel; or
  - ☐ Welded connection
- ☐ Unions requiring gaskets or packing shall not be used in connection with fuel oil lines, fill lines, or vent lines.

TANK FILL CONNECTIONS

CSA B139.1.0:19 - 10.1.2.

- ☐ Each fill connection shall be installed not less than 1 m above ground level and in a spill containment device that conforms to CAN/ULC-S663 or CAN/ULC-S664.

CSA B139.1.0:19 - 10.1.9.

- ☐ The entry to a fill pipe shall be located outside the building at an elevation lower than the termination of the vent pipe from the tank

CSA B139.1.0:19 - 10.3.1.

- ☐ An auxiliary supply tank fill pipe shall be equipped with a level control device that:
  - ☐ When the fuel level reaches 90% capacity, the fill line pump shuts off or the closing of an automatic valve.
  - ☐ When the fuel level reaches 95% capacity, the fill line pump shuts off, an alarm to annunciate, or the closing of an automatic valve that will alarm to annunciate.

TANK OVERFILL PROTECTION

CSA B139.1.1:19 - 4.5.7.

Supply tanks or auxiliary tanks provided as part of an appliance shall comply with 10.1.3. of CSA B139.1.0.

CSA B139.1.0:19 - 10.1.3.

- ☐ Fuel oil tanks shall be equipped with an overfill protection device that conforms to CAN/ULC-S661.

TANK VENTING

CSA B139.1.1:19 - 6.3.

Venting of supply tanks or auxiliary tanks shall comply with 10.5. of CSA B139.1.0.

CSA B139.1.0:19 - 10.5.

- ☐ Venting requirements must meet the tank manufacturer's construction standards

CSA B139.1.0:19 - 10.5.1.4.

- ☐ The tank vent pipe shall be no less than the tank vent fitting size

CSA B139.1.0:19 - 10.5.1.7.

- ☐ The tank vent pipe shall terminate at least 6 inches above the connection to the fill pipe.
- ☐ The outlet shall be provided with a weatherproof hood or vent cap with equal or greater opening as the outlet.

CSA B139.1.0:19 - 10.5.1.8.

A vent pipe that terminates adjacent to a building shall be installed so that the termination point is:

- ☐ Close to the building;
- ☐ High enough to clear snow accumulation;
- ☐ Not less than 2 ft from building openings (windows, doors, air intakes, etc.,)

CSA B139.1.0:19 - 10.5.2.1.

- ☐ When installed inside a building, an engine enclosure, shed, or other type of permanent structure, a tank, except an integral supply tank certified as part of the appliance, shall be equipped so that the normal and emergency vents, or combined normal and emergency vents are piped to terminate outdoors.

CSA B139.1.0:19 - 10.5.2.2.

- ☐ For tanks provided with secondary containment (double walled tanks), the secondary containment (interstitial) vent is not required to terminate outdoors.

STORAGE ROOMS FOR TANKS

CSA B139.1.0:19 - 7.4.1.

- ☐ Storage tank rooms shall be dedicated to housing aboveground storage and supply tanks and related equipment and shall be used for no other purpose than storage and distribution of combustible liquids in closed processes.

CSA B139.1.0:19 - 7.4.2.

- ☐ Each storage tank room shall:
  - ☐ Minimum 2hr fire rated as per AHJ
  - ☐ Walls constructed of solid masonry units or poured concrete construction
  - ☐ A floor of concrete or other non-combustible construction, and sealed to be resistant to fuel oil;
  - ☐ A door to the room that includes a self-closing device that has a fire-resistance rating applicable to the fire separation rating.
  - ☐ A minimum of 600 mm clearance around the tank for the purpose of inspection and maintenance;

CSA B139.1.1:19 - 7.4.4.

- ☐ Floor drains shall not be installed in tank storage rooms.

CSA B139.1.0:19 - 7.4.5.

- ☐ Sumps for sanitary drainage or sub-soil drainage and their associated pumps and control systems may be located in a tank storage room, provided that
  - ☐ The sump is protected by a dike equal in height to that required in **7.4.2.** Which separates the sump from the rest of the room;
  - ☐ The floor area inside the dike is sealed;
  - ☐ The edge of the sump projects above the floor a minimum of 50 mm (2 inches) and is liquid tight;
  - ☐ An oil detection device is installed inside the sump dike area; it shall provide an alarm to a supervised location.

SPILL CONTROL

CSA B139.1.1:19 - 6.2.1

Tanks that directly supply engines shall be

- ☐ Installed in an engineered spill control system which conforms with the provincial fire code.

SECTION 2 - GREATER THAN 2,500 L

IN-BUILDING STORAGE TANKS > 2,500 L SUPPLYING APPLIANCES

This section is in compliance with **Division B, Part 4 of the National Fire Code - 2023 Alberta Edition** for tanks with volumes greater than 2,500 L installed inside buildings.

OCCUPANCY - *NFC(AE), Div B, 4.3.13.1.*

- ☐ Storage tanks located inside buildings shall
  - ☐ conform to NFC(AE) Subsections 4.3.13. to 4.3.15.
  - ☐ Be installed in industrial occupancies
  - ☐ Be installed in occupancies other than industrial occupancies where combustible liquids are stored and used for fuel for oil-burning equipment, emergency generators and fire pumps.

MAXIMUM QUANTITIES AND LOCATION- *NFC(AE), Div B, 4.3.13.4.*

- ☐ Storage tanks for flammable liquids or combustible liquids shall be
  - ☐ Located in dedicated storage rooms conforming to Subsection 4.3.14. and
  - ☐ Located in conformance with Tables 4.3.12.4.-A and 4.3.13.4.-B.

STORAGE TANK CONSTRUCTION- *NFC(AE), Div B, 4.3.13.5.*

- ☐ Storage tanks with an individual capacity exceeding 2,500 L but not exceeding 20,000 L that are used in conformance with Table 4.3..13.4.-B shall be:
  - ☐ Double walled construction in conformance with CAN/ULC-S601, and
  - ☐ Monitored for leakage in conformance with high-tech secondary containment monitoring that continuously monitors the secondary containment.
- ☐ Storage tanks with an individual capacity exceeding 20,000 L that are used in conformance with Table 4.3..13.4.-B shall be:
  - ☐ Double walled construction in conformance with CAN/ULC-S655, and
  - ☐ Monitored for leakage in conformance with high-tech secondary containment monitoring that continuously monitors the secondary containment.

PIPING SYSTEMS - *NFC(AE), Div B, 4.3.13.6.*

- ☐ Piping systems serving oil-burning equipment, diesel-engine-driven emergency generators and fire pumps shall conform to CSA B139 Series 19.

CONNECTIONS FOR FILLING AND EMPTYING - *NFC(AE), Div B, 4.3.6.4*

- ☐ Connections for filling and emptying storage tanks shall be provided with a spill containment device in conformance with CAN/ULC-S663 - ***New***
- ☐ Connections for filling and emptying in building aboveground storage tanks shall
  - ☐ be kept closed to prevent leakage when not in use, and
  - ☐ be located not less than 1.5 m away from building openings (exit, bay door, window, air intake, etc.)

SUPPORTS, FOUNDATIONS AND ANCHORAGE - *NFC(AE), Div B, 4.3.13.11*

- ☐ Storage tank(s) foundation is level ground and/or non-combustible supports.
- ☐ Supports exceeding 300 mm in height shall have a minimum fire-resistance rating of 2 hr supported by documentation.

VENTS - *NFC(AE), Div B, 4.3.13.10.*

- ☐ Normal and emergency vents for storage tanks in buildings shall be in conformance with API STD 2000, "Venting Atmospheric and Low-Pressure Storage Tanks," or the tank design standards.
- ☐ Location of vent pipe outlets on storage tanks must meet the following requirements:
  - ☐ Normal Vent Pipes for storage tanks of Class I liquids shall be located outside buildings not less than:
    - ☐ 3.5 m above adjacent ground level,
    - ☐ 1.5 m from any building openings, and
    - ☐ Discharge so that flammable vapours will not enter the building or be trapped anywhere near the building.
  - ☐ Normal Vent Pipes for storage tanks of Class II or IIIA liquids shall be located outside buildings not less than:
    - ☐ 2.0 m above adjacent ground level,
    - ☐ 1.5 m from any building openings, and
  - ☐ Emergency vent outlets for storage tanks shall discharge outside buildings not less than 1.5 m from any building opening and from any combustible component of any building's exterior wall.
- ☐ Storage tanks are permitted to be connected to a common vent pipe for normal relief venting, provided the vent pipe size is designed to accommodate the requirements of all tanks.

ROOMS FOR STORAGE TANKS - *NFC(AE), Div B, 4.3.14.*

Design and Construction

- ☐ Rooms for storage tanks inside buildings shall be:
  - ☐ Separated from the rest of the building by a fire separation having a fire-resistance rating of at least 2 hrs;
  - ☐ Designed to contain a spill equal to at least 100% of the volume of the largest storage tank, or drain away the spilled flammable liquids or combustible liquids,
  - ☐ Made liquid-tight where the walls join the floor, and
  - ☐ Used for no other purposes than the storage and handling of flammable liquids or combustible liquids.

Clearances

- ☐ A minimum clear space of 550 mm shall be maintained between the storage tank and the walls of the room for storage tanks. If the clearance cannot be met, Edmonton Fire Rescue Municipal Variance EFRS-MV003 will be in effect and all requirements there-in shall be followed.

Placards

- ☐ Placards that identify the liquids stored as flammable liquids or combustible liquids shall be posted on the entrance door to the room.

IDENTIFICATION OF PIPING SYSTEMS- NFC(AE), Div B, 4.5.4.1.

- ☐ All pipelines for flammable liquids or combustible liquids shall be marked with the contents of the line and direction of flow

FIRE EXTINGUISHER - *NFC(AE), Div B, 2.1.5*

- ☐ A room for storage tanks shall be provided with a minimum 10BC fire extinguisher.

Failure to comply with the National Fire Code (Alberta Edition) can result in fines and even jail time as outlined in the Safety Codes Act.

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