



# Hydrogen Fueling Station Code Analysis

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## Introduction

- Meet the regulations for NFPA 2
- Meet the regulations for WAC Liquid and Gaseous code
- Code analysis on possible locations for Hydrogen refueling station
- Find if refueling station will meet code drawback distances
- Draw possible station orientations

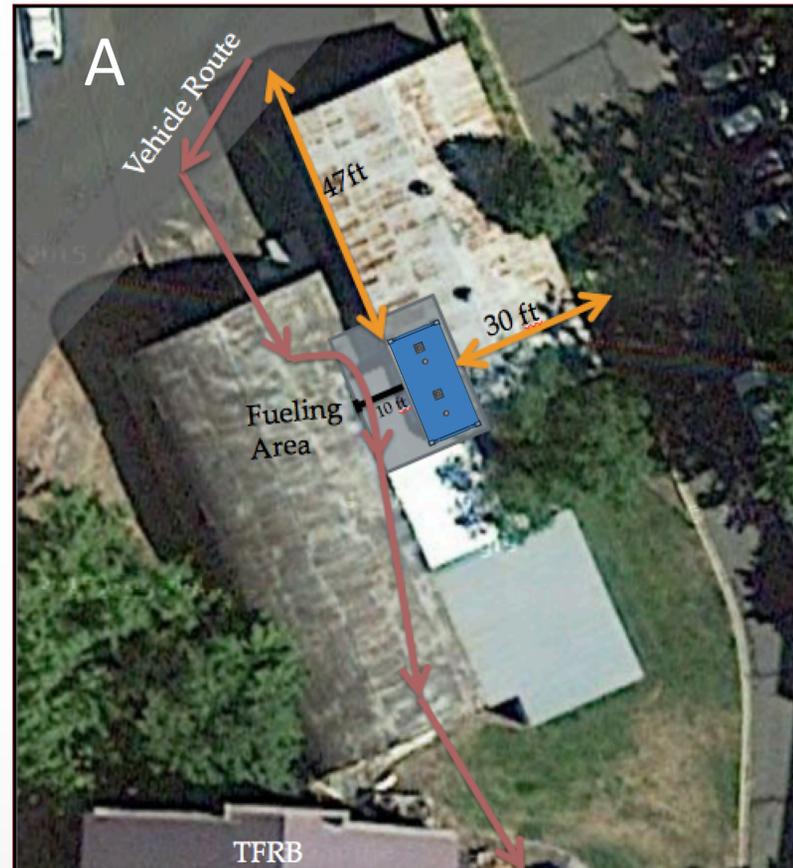
## Washington Administration Code (WAC) Liquefied System Code

- 1) Fire-resistive Building and Fire Walls\* 5 ft
- 2) Noncombustible Building\* 25 ft
- 3) Other Buildings\* 50 ft
- 4) Wall Openings
  - Windows etc (Need to be boarded up) 75 ft
- 5) Intakes
  - Air compressor intakes or inlets to ventilation or air-conditioning 75 ft
- 6) Flammable Liquids
  - Above ground and vent or fill openings 50 ft
- 7) Hydrogen Containers
  - Between stationary liquefied hydrogen containers 5 ft
- 8) Flammable Gas Storage 50 ft
- 9) Storage
  - Liquid oxygen storage and other oxidizers 100 ft
- 10) Combustible Solids 50 ft
- 11) Fire Hazard
  - Open Flames, smoking, and welding 50 ft
- 12) Concentrations of People
  - In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly etc. ... 75 ft
- 13) Public
  - Public ways, railroads, and property lines 25 ft

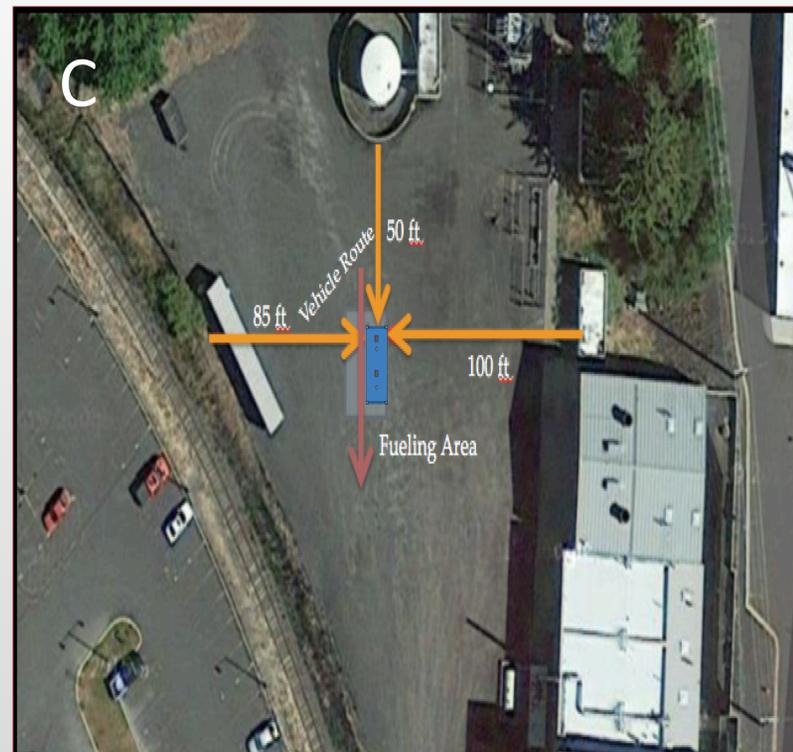
\* Refer to standard types of building construction, NFPA No. 220-1969 for definitions of various types of construction.

Note 1: The distance in Nos. 2, 3, 6, 8, 10, and 13 may be reduced where protective structures, such as firewalls equal to height of top of the container, to safeguard the liquefied hydrogen storage system, are located between the liquefied hydrogen storage installation and the exposure.

Note 2: Where protective structures are provided, ventilation and confinement of product should be considered. The 5-foot distance in Nos. 1 and 7 facilitates maintenance and enhances ventilation



- A. Possible station orientation at our Quonset Hut location
- B. Possible station orientation at our Quonset Hut location
- C. Possible station orientation at our coal yard location



## Washington Administration Code (WAC) Gaseous System Code

- 1) Building or Structure\*
  - Wood Frame Construction 10 ft
- 2) Wall Openings
  - Not above any part of a system 10 ft
  - Above any part of a system 25 ft
- 3) Flammable Liquids Above Ground
  - 0 to 1,000 gallons 10 ft
- 4) Flammable Liquids Below Ground
  - 0 to 1,000 gallon tank 10 ft
  - Vent or fill opening 25 ft
- 5) Flammable Gas Storage Low/High Pressure
  - 0 to 15,000 CF capacity 10 ft
- 6) Fast Burning Solids
  - Lumber, excelsior, or paper... 50 ft
- 7) Slow Burning Solids
  - Heavy timber or coal... 25 ft
- 8) Sources of Ignition
  - Open flames etc. ... 25 ft
- 9) Intakes
  - Air compressor intakes or inlets to ventilation or air-conditioning 50 ft
- 10) Concentrations of People
  - In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly etc. ... 25 ft
- 11) Public Sidewalks 15 ft
- 12) Line of Adjoining Property 5 ft

\* Refer to NFPA No. 220 standard types of building construction for definitions of various types of construction. (1969 Ed.)

## Conclusion

- Orientation A and B complies with NFPA 2
- Orientation A and B at the Quonset Hut location will fail to meet the WAC code for distance away from concentrations of people for the Liquid System Code
- Orientation C at the coal yard location best complies with NFPA 2 and the WAC code
- If WAC code is changed or replaced with NFPA 2, then the Quonset Hut location will comply

## References

NFPA 2  
Hydrogen Technologies Code  
National Fire Protection Association, Quincy, MA (2016)

WAC 296-24-31505  
Washington Administration Code  
Liquefied Hydrogen Systems

WAC 296-24-31503  
Washington Administration Code  
Gaseous Hydrogen Systems

## National Fire Protection Association (NFPA 2) 2016 ed.

- Not less than 25 ft (7.6 m) from the nearest important building not associated with the LH2 facility
- Not less than 25 ft (7.6 m) from the line of adjoining property that can be built upon
- Not less than 25 ft (7.6 m) from fixed sources of ignition
- Such that all parts of the vehicle being served will be on the premises of the service station
- Such that the nozzle, when the hose is fully extended, will not reach within 10 ft (3 m) of building openings, as adopted in 10.3.3.2.2.4
- Fueling facilities shall be free within 25 ft (7.6 m) from rubbish, debris, weeds, and other material that present a fire hazard