Tariffville Connecticut's New Water Tank Construction Started Fall, 2016 – To be completed soon !

This document was started 17 October, 2016; last updated 4 December, 2016.

Our present tank, built nearly 80 years ago!

Our present tank, as it looks today.

New tank location, topsoil scraped away.

Hoe Ram removing basalt bedrock.

Site preparation was done by Simscroft-Echo, a Simsbury company.

The new tank will have the same water capacity of 330,000 gallons, which is enough for domestic water and fire protection for the entire Village of Tariffville.

A laser level was used to ensure the new tank floor was level.

The site preparation is completed, ready for DN Tank company to begin construction.

A 4’ x 8’ sign on Elm St. describes the project to the public. Federal EPA requires the sign.

DN Tanks works safely, and has great experience installing water tanks world-wide.

The new tank total cost is expected to be $1.501 million dollars. $300,000 of that amount is a subsidy from the CT Dept. of Public Health’s DWSRF (Drinking Water State Revolving Fund), and the remainder is a loan. That leaves $1.201 million dollars to be paid by the customers of the Tariffville Water Commission (TWC). This will be done using a 20-year loan of EPA money (Federal Environmental Protection Agency) administered by the State of Connecticut, at approximately 2% interest.

CT DPH visited on 10/13/16 to inspect all aspects of the the project, including safety, signage, & documentation.

The forms for the concrete for the tank base are in place, and concrete trucks will soon arrive.

A groundbreaking ceremony was held on Sept. 22 Speaking were DPH Deputy Commissioner Yvonne Addo, CT Representative John Hampton, Simsbury 1st Selectman Lisa Heavner, and TWC V.P. Kevin Donahue.

Members of the Tariffville Water Commission show they can shovel sand too.

This is a ***concave up*** pouring bed for the 13 wall sections. Each wall section weighs 8.4 tons, is 4.5 inches thick, and Measures 12 feet wide by 24 feet high.

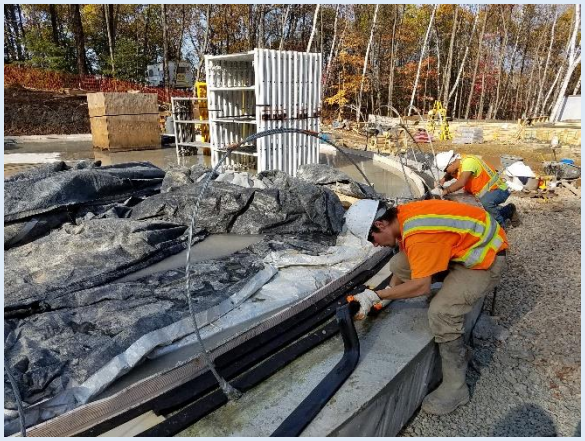
This is a ***convex up*** pouring bed for a dome sector. Each of the 12 dome sectors weighs 4.25 tons, is 17 feet long, 13 feet wide at wide end, and 4.5 feet at narrow end.

The rebar in the dome sector can be seen here as concrete is poured. The “screed board” on the right ensures the shape and thickness is correct.

The pouring of concrete in the wall section 12’ wide by 24 feet high is starting.

As of November 1, 2016, the concrete floor is complete. Next week a large crane will lift the wall panels into place, getting the tank closer to completion.

"Seismic" cables will stabilize wall sections.



Foam padding is applied where the wall sections will rest on the tank foundation.

A 36" "manway" will allow entry into the empty tank.

The manway hatch is all stainless steel.

Roof dome sectors were poured one atop the other, one per day. 12 of these are needed, 4.25 tons each.

The center dome panel is curing. It will have the vent, and weighs 3.79 tons. The scaffolding that will support the roof dome sectors, and the center dome panel, during construction, can be seen being assembled.

Six wall panels, one atop the other, were poured, one per day. The wood inserts which created the "keyway" at the bottom of each panel, are being removed above, prior to being lifted into place by a crane.

This scaffolding is temporary, used to hold the weight of the 12 "dome sectors" and one circular "dome panel" during the erection of wall panels and the dome.

This ladder will provide access to the hatch on the dome, for inspection & testing.
A locked plate will prevent unauthorized climbing of the ladder.

This top wall panel contains the iron “overflow” pipe, encased in concrete,
to be used only if the pumps fail to turn off when the tank is full.

This 5-axle crane (10-wheel drive) has all axles steerable. It weighed 130,000 pounds as delivered, then had two 20,000 pound counterweights added to provide the stability needed to lift the heavy wall sections from where they were poured, to the base of the tank.

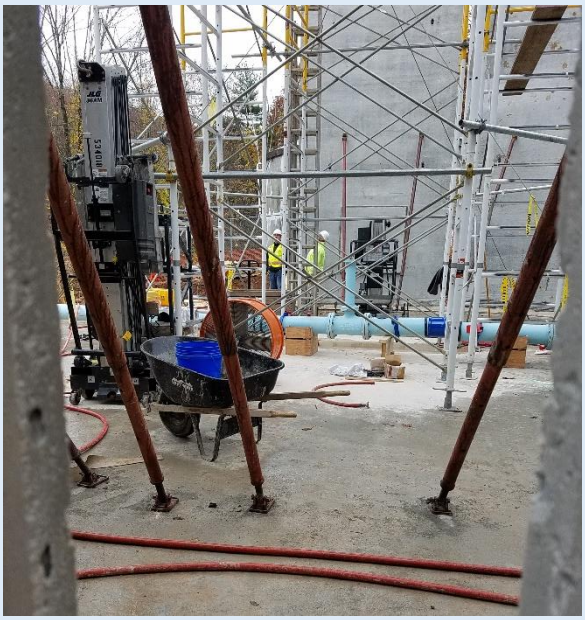
275-ton crane, used to lift and install 13 wall sections and 12 roof dome sectors.

8.5 ton 26 foot high wall section lifted, soon to be lowered onto tank floor concrete.

Scaffolding in place, awaiting dome panel. Done panel goes first, then wall panels.

1st wall panel being lowered onto tank floor.

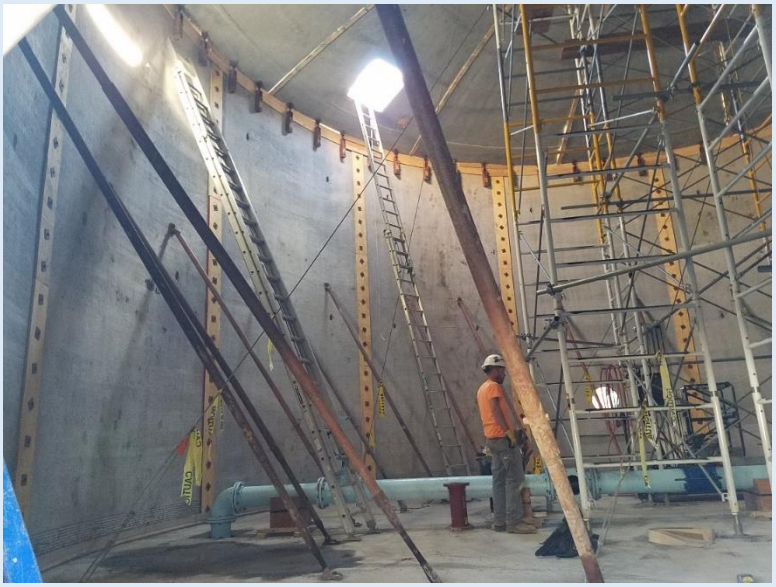
13 wall sections in place. Note the mold for circular dome panel in foreground.



4 wall section braces keep each wall panel vertical until dome sectors are installed.

Inlet/outlet piping on floor of water tank.
Passive mixing is used to prevent stagnation.

A concrete pump, to be used to bring concrete up to the top of the new tank to complete the connecting of the wall sections together, and the dome sectors together.



Inside the tank, showing the scaffolding (to be in place until concrete is poured to hold all wall sections & dome sectors together). The blue inlet/outlet 8” pipe, and wall braces (temporary) can be seen. At the top is the access hatch, to be used for periodic inspections of the new tank.

The “Dome Ring” forms are in place, and soon cement will create the dome ring on the outside of the dome sectors, and cement will fill the slots between the wall sections. The Simscroft BobCat is creating a level “ring road” around the tank, so that wire wrapping (many hundreds of turns of steel wire), to keep all concrete in compression, can soon happen.

Dome ring (at top) in place, and “shotcrete” being sprayed on steel wall outer layer. Note bare steel on right, soon to be coated.

Close-up of tank wall after shotcrete was applied.

Apparatus used to wrap the tank walls with more than 400 turns of 0.168” steel wire. Here the top 8 feet or so of the tank has Been wrapped with “pre-stress” steel wire.

Close-up view of the wire wrapping “traveler dolly” that precisely spaces turns.

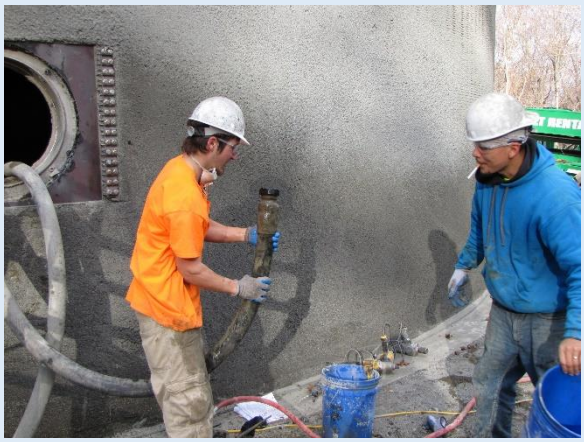
The total amount of steel wire used to “pre-stress” the 13 concrete wall sections and the concrete “Dome Ring”, is more than 12 miles long, and weighs just over 5,000 pounds. The steel wire is always in tension (steel loves this), and that keeps the concrete in compression (concrete is very strong in compression and is happy to be this way).

This device applies the wire with precision spacing below the wire just applied above it. The tension in the wire is enormous, to keep the concrete in compression always, and to oppose the outward force on the wall sections when the tank is full of water.

With the Dome Ring at the top of the tank wrapped with pre-stress wire, and covered with shotcrete, the scaffolding can be safely removed. It (and a LOT of other tools and equipment used inside the tank) were removed through the rectangular opening in one wall panel of the tank.

The steel wall panel braces, 3 or 4 for each of the 13 wall panels, will be removed once the wire wrapping is completed. Then the rectangular hole will be sealed with a steel plate and concrete.

Concrete being delivered to the concrete pump, which pushes concrete through hoses to the “cove” inside the water tank.



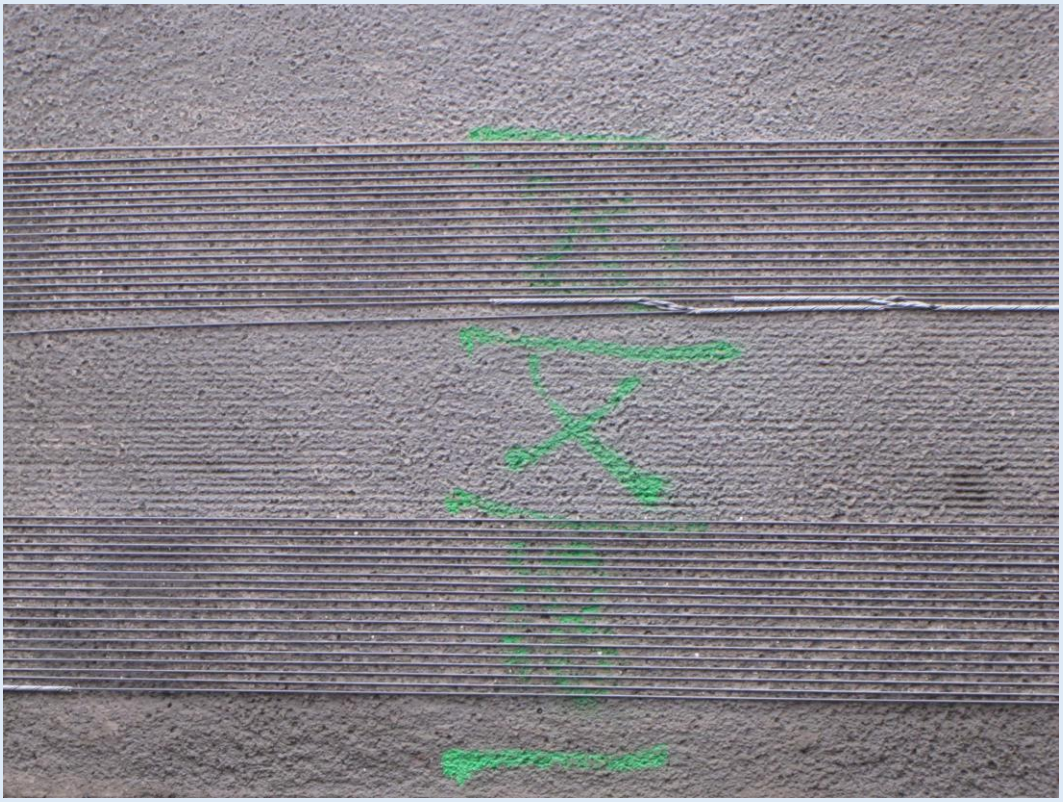
Garrett & Felix preparing to clean the hose after the concrete “pouring” of the “cove” is done for the day.

The metal frame for the “manway” in place after the pre-stress wires have been cut. The clamps on both sides of frame hold the wires in tension, ensuring the tank concrete is always under compression.

Close-up of the clamps for the pre-stress wire that keep it in tension, even when it is cut for openings in the tank wall (for the manway and for the overflow pipe).

At this point, about ½ of the pre-stress wire (over 12 miles, 5,000 lb. total) has been wrapped around the water tank.

After all the steel wire is wrapped around the tank, additional shotcrete will be applied over it. Finally the tank will be connected to the water main, it will be treated with chlorine (only once, to disinfect the entire tank inside surfaces), and placed “online” as the only water source for the over 1,300 residents of the Village of Tariffville.



Shown above is the final wrapping of the steel “pre-stress” wire. Over 12 miles, (5000 pounds) of wire has now been applied to the tank walls.
This wire ensures that the concrete is always in compression, and helps to resist the pressure of 1/3 of a million gallons of water in the tank.

On December 3, 2016 the tank was coated, again, with the final application of "shotcrete". The shotcrete assures that the pre-stress wire will always be in tension, keeping the concrete in compression, and opposing the outward force of the water stored in the tank.

Next steps are to attach a few items to the tank (vent, solar panels and hatch on the dome, external climbing ladder, overflow piping, inlet/outlet piping and valves, and the "manway" hatch in the wall). Then the connection to the water main will be done, the tank will be washed on the inside and fully sanitized with chlorine.

FYI, chlorine will be used once, to sanitize the tank. The Tariffville water is well water goes directly from our wells to the tank, and that normally has nothing added to it (no chlorine, no fluoride). However, right after the tank sanitizing is done, you may notice a slight chlorine taste and odor. The chlorine concentration will be very close to what most water systems (including MDC, and Aquarion in Simsbury) must add constantly to keep the water safe. The Tariffville water chlorine concentration will decrease rapidly, and soon we'll again enjoy drinking some of the best water in Connecticut from our wells.

Come the spring of 2017, the tank wall will be painted, and the old water tank will be demolished and removed.