

Jack DiEnna

Executive Director

The Geothermal National & International Initiative

**Wm. L. Buck School, a partnership
between Bosch & American Water That
WORKS!**

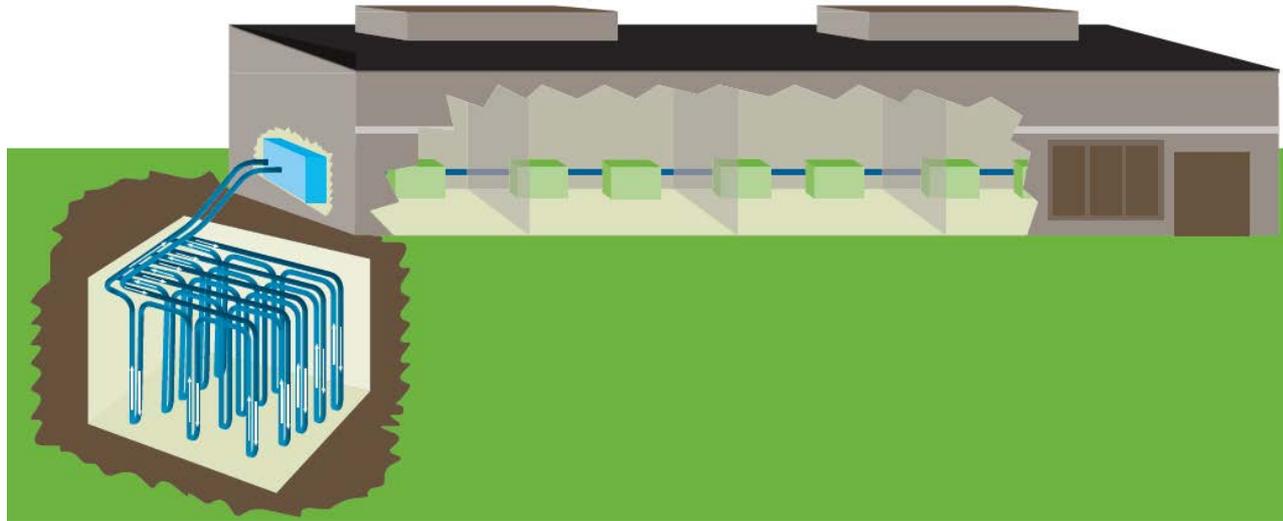
BACKGROUND: This project started in the office of PSC Commissioner Patricia Acampora when we were discussing our continuing frustration in getting a NY utility interested in promoting geothermal heat pumps. Since we had very little success with Electric & Gas Utilities, the commissioner suggested we try American Water, the largest privately held water company in the US. One phone call brought Wm Varley, then President of NY American Water & his Sr. VP B.Bruce and the project was started. I brought the project to R. Soper, President of Bosch TT and he immediately signed on and volunteered the services of D. Penn for the engineering.



Geothermal National and International Initiative Inc.
1615 M.Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

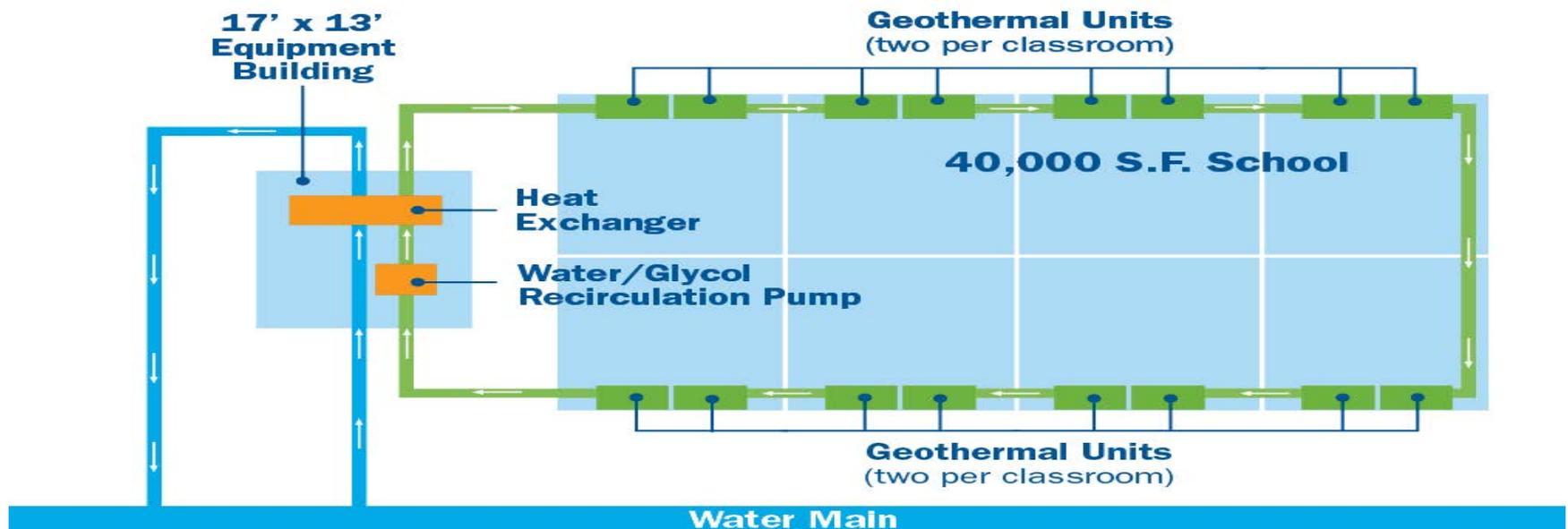
We are all Familiar with a conventional loopfiled arrangement, unfortunately they do not always work in an “urban” setting.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This is the final configuration and the overall goal of the project, to put the water back into the system after extracting the heating & cooling energy from it.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This is the heat exchanger where the utilities water is used as the transfer medium to deliver the heating and cooling energy which increases the comfort level in the classroom.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This is the building that contains the heat exchanger and the glycol recirculation system. This was done so that American Water could have access to the equipment at all times of the day.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This is how the units went in as you can see we replaced the 63 year old unit vents with Bosch CA model water source console units.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

These are the water to air geo units that are located above the ceiling that provide the conditioned air to the open areas of the building such as the gym & cafeteria.

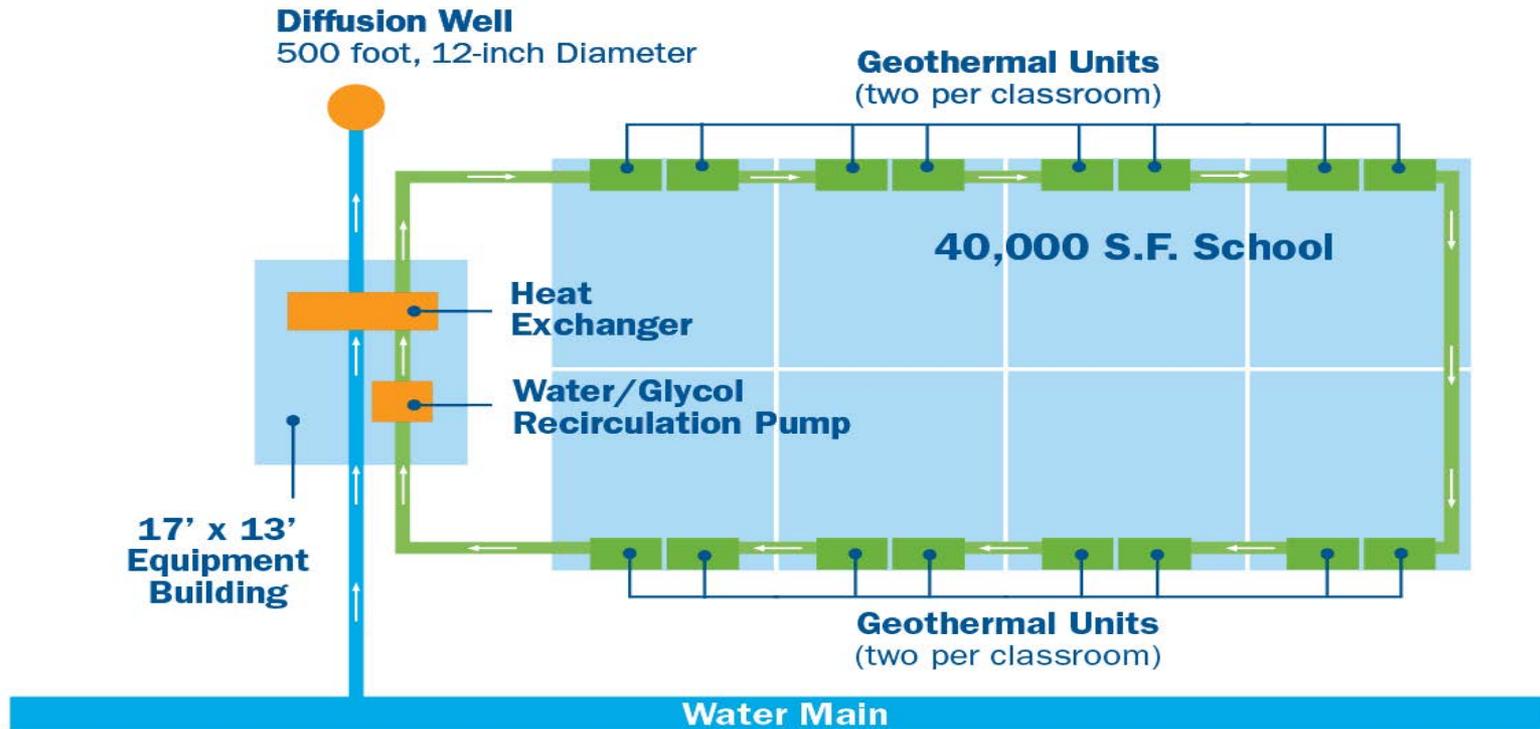


GEO  NII

Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This innovative system designed specifically for this project opens up a entire new market for our technology.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

This innovative project, which would retrofit a 1950's era school with a new high efficiency geothermal system, began in September 2014. With the construction crews working at night to avoid any disruption of classes the project was completed in February of 2015 and the system was put into service. The school in 2014 was using 73kbtu per sq ft with the heating only boiler system, no cooling except for 19 window units in the offices. In 2016 they were using 32kbtu per sq ft with the geo system providing heating and cooling (2015 was eliminated since both systems were used.)

The school has saved over \$4,000 annually while reducing energy use by 56% and reducing costs by 6%.



Geothermal National and International Initiative Inc.
1615 M. Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

How much energy can be extracted from the Ground?

In a study conducted by Dr. Marvin Smith at the IGSHPA lab at OSU in 1999, he determined that a four ton system extracts 30,510 BTUs per hour (3413 BTUs= 1kW) X 24 hours = 732,240 BTUs per day or 214.5 kW of energy daily.

In a 30 day period that would equate to 21,967,200 BTUs or 6,436.33 kW which equates to 6.438 MWh.

In The MA Alternative Portfolio Standard 1 MWh = 1 Alternative Energy Credit (AEC) which is worth \$22.23 this affords another reason why Utilities or 3rd party owners want to own a ground loop.



Geothermal National and International Initiative Inc.
1615 M.Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

**We cannot solve our problems with the
same thinking we used when we created
them.” - Albert Einstein**

“DARE GREATLY” - CADILLAC



Geothermal National and International Initiative Inc.
1615 M.Street N.W. Suite 800 Washington DC 20036

The Road to 30%!

The Geothermal National & International Initiative.

If you have any questions or need further information please contact me at 610-659-4998 or e-mail me at jdienna@geo-nii.org



Geothermal National and International Initiative Inc.
1615 M.Street N.W. Suite 800 Washington DC 20036

The Road to 30%!