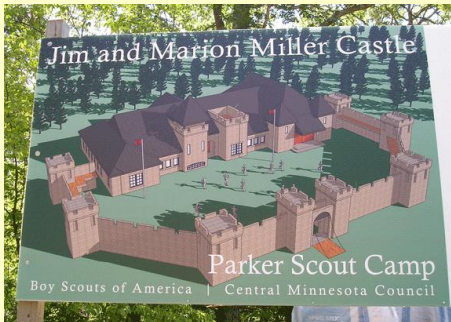




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## Underground Drip Installation at the Miller Castle.



When you think of Castles, you probably have images of the Royal Castles in Europe. Castles which are only for visitors to look upon, and for royalty to show off their wealth. There is another castle that is only a short distance from St. Cloud. This Castle is not host to royalty, but to hundreds of Scouts using it as a place to camp and to interact with the medieval surroundings. Every weekend Scouts throughout Minnesota embark on a journey to Merrifield Minnesota to have the opportunity to stay in a state of the art facility which is the Jim and Marion Miller Castle which is just North of Brainerd Minnesota. The castle is a full service facility with indoor sleeping quarters, full service dining hall and shower facilities. The detail which was used to decorate the castle is unbelievable. A person who had an impact in making these details a reality is Bruce Gohman of W. Gohman Const. and Eagle Trace Golfers Club. Bruce who is a past president of the Central Minnesota Scouting council has been apart of the creation of this reality for many years. When he was faced with the challenge of irrigating the 6000 square foot courtyard, Bruce knew that he did not want to apply overhead irrigation. Because of the high content of iron in the water, the overspray would discolor the



concrete walls. Bruce started to research other products that would do the same job and provide a good stand of turf. The result was underground drip. Though drip has been available for planting beds for many years, under-ground drip in a turf

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application brings on its own challenges. The small emitter which put out 1 gallon of water per hour can easily be clogged by intruding roots. Bruce came upon a product which is made by Toro a Minneapolis based irrigation and turf equipment company. This is DL2000



sub surface drip tubing. This drip tubing uses a US Government-approved non-toxic TREFLAN® that creates a force-field effect, guarding against root intrusion. TREFLAN is impregnated during the manufacturing process and requires no maintenance. Drip In® PC self-cleaning emitters provide precise, trouble-free water application. This product would provide the water which was needed without applying any overspray on the castle walls. With product chosen, now began the hard part, installing over 7000 feet of pipe and over 1000 fittings and a hi-tech irrigation clock to operate it all. I was very fortunate to have been given the opportunity to help with the installation of this system. Due to the sand soil pipes were to be installed on 1 foot centers with emitters at each foot of the pipe. The subsurface drip had to be placed 4 inches below the soil.



Special filtering and pressure regulation had to be used to deliver water to the system. Because of the low output emitters the pressure had to be reduced to 30 PSI and Micro Screen inline filters were used to keep out contaminants. It took over a hundred Man Hours to successfully install this system. Continued->

A traditional irrigation system for this sized property would only take about 25 Man Hours to install. With the Irrigation being totally submersed underground, the application of the water was very pin point, applying the water exactly where it was needed, which was at the root zone. Here are some pictures showing one of the zones through a 10 minute period.

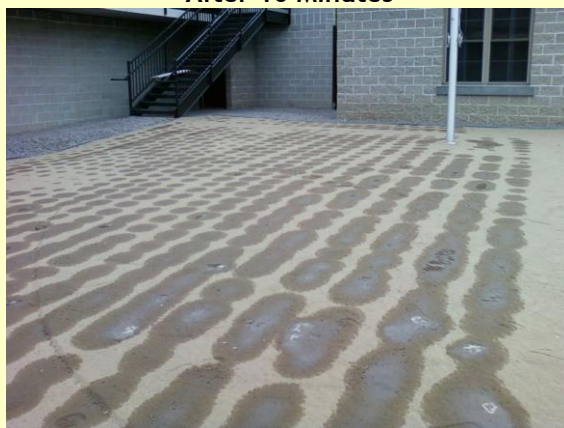
After 2 Minutes



After 4 Minutes



After 10 Minutes



Once full saturation was complete, the system would only have to maintain the water which is used by the grass plant. The implimentation of the program was to be performed by an advanced irrigation controller which was also provided by Toro.



This controller in combination with the wireless water conservation rain sensor would control the amount of water which would be needed for the turf to grow.



This is definitely the future of Irrigation. With the demand of water increasing every day, the use of it will require more intelligent delivery systems like the one shown here. For more info on this type of system or other water smart systems, call 320-310-4241 or email me at [chrisv@useyourwaterright.com](mailto:chrisv@useyourwaterright.com).

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