



**PROJECT:**

# Gerald R. Ford International Airport Grand Rapids, Michigan

**NEED**

Grand Rapids' Gerald R. Ford International Airport (GFIA) is Michigan's second-largest airport, serving over 2.3 million passengers each year. To facilitate safe airfield operations, aircraft must be deiced during the winter months. The runoff from deicing operations contains high concentrations of glycol compounds, which while readily biodegradable, can result in environmental impacts to downstream receiving waters. To minimize potential impacts, GFIA needed a simple, robust treatment process that could handle peak flows and loadings resulting from winter storms.

**LOCATION**

Grand Rapids, Michigan

**PROJECT TYPE**

Airport Deicing

**COMPLETION DATE**

2015

**DESIGN CAPACITY**

6,000,000 gpd  
22,710 m<sup>3</sup>/d  
2,763 lb/d BOD<sub>5</sub>  
1,253 kg/d BOD<sub>5</sub>

**TREATMENT**

Vertical Flow Wetlands  
Fill-and-Drain Wetlands

**AWARDS**

*National Recognition Award for  
Engineering Excellence – 2017,  
ACEC*

**SOLUTION**

A Natural Treatment System (NTS) was built by GFIA that operates entirely by gravity flow. The first stage of the process utilizes six siphon-dosed vertical flow treatment cells with a total area of 1.1 hectares (2.5 acres), followed by six fill-and-drain treatment cells (siphon-drained) with a total area of 0.6 hectares (1.5 acres).

The NTS treats deicing runoff prior to discharge into the Thornapple River. Operating entirely on gravity, the system uses almost zero energy for water treatment; the only electricity required is for instrumentation and controls. Since the deicing compounds are nutrient deficient, a small amount of fertilizer is metered into the influent, based on the flow rate and concentration of the runoff. NWC teamed with the local Grand Rapids firm, Prein and Newhof, to implement the design.

**BENEFIT**

The NTS is an extremely robust, simple treatment system that has proven capable of handling a wide range of flows and organic loadings during many winter storms. The wetland meets all permit requirements for CBOD<sub>5</sub> removal and has won numerous state and national awards for environmental excellence.

