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North Oakville East Wastewater Pumping Station

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SUMMARY

The North Oakville East Wastewater Pumping Station has been operating successfully since November 2013.

Studies conducted by the Region of Halton determined the need for a new wastewater pumping station to meet the increased servicing requirements in North Oakville. An AECOM-led team was retained to identify a preferred servicing solution, and to provide design and construction services for this new facility. The pumping station has been operating successfully since November 2013 and serves an area of approximately 2,400 hectares with an estimated population of 46,000 people.

INNOVATION

The North Oakville East Wastewater Pumping Station is a landmark project in terms of its presence in the community. Although it is a public utility building, it was designed to be an attractive building that maintains the heritage character of the community. The building utilizes design components found on early 20th century fire stations and incorporates earth-tone masonry materials, large arched doors and a peaked roof constructed to an appropriate scale.

A design challenge of this project was the incorporation of a tall exhaust stack required for the emergency diesel generator. The solution was to mask the stack by surrounding it with a clock tower that ultimately became the focal point of the building. This clock tower, with clocks on all four sides, is visible from afar and from all sides. It has become a point of reference for members of the community and visitors to the area, as well as a welcome sight in the rather featureless terrain.

A number of key urban design components were addressed in the site organization including:

- Providing a streetscape treatment that is consistent with the vision and principles of the North Oakville Urban Design and Open Space Guidelines for this section of Dundas Street West;
- Placing and massing the building to emphasize the corner location of the site;
- Using landscaping to provide screening of the utility functions of the building;
- Locating driveway access, loading and service facilities out of sight at the rear of the building; and
- Creating a balance between the need to maintain site security and public realm appearance.

The clock tower has become a point of reference for members of the community and visitors to the area.

From a technical perspective, initial low flows received from the station required the development of detailed commissioning and phasing plans to ensure the station pumps and other equipment were operated and maintained to optimize performance and energy consumption. Detailed plans were also developed to ensure all of the equipment, SCADA and instrumentation were tested to meet specifications without discharging to the outgoing force mains which were still under construction downstream of the station. In order to ensure that all testing scenarios were simulated, equipment was commissioned using water instead of sewage, and was recirculated through the Station's piping and gates. In order to accommodate future growth and development in the area, the station's operating plan has been designed to adapt in order to suit and meet demand as increased wastewater flows to the station occur over time.

COMPLEXITY

Throughout design and construction, significant coordination of efforts with the residential developers and home-builders to the north of the project site was required to ensure the station would be in service and ready to receive the additional flows that would immediately be generated upon occupancy of the homes they were building.

The design of The North Oakville East Wastewater Pumping Station also had to adhere to the North Oakville Urban Design and Open Space Guidelines. These guidelines are a detailed set of objectives and illustrated recommendations encompassing the North Oakville East Secondary Area. The following elements had to be specifically considered and addressed according to the stated guidelines:

- Building orientation and site layout
- Building articulation and detailing
- Choice of building materials
- Porches and building projections
- Private signage

To meet these guidelines, the following design elements were incorporated:

- The Station frames the streets by maintaining a consistent front yard setback with a decorative fence and landscaping along the corresponding property lines.
- The facades of the building are highly articulated with false metal doors and false inset window panels, and through the use of alternating materials and recesses in the walls. Roof gables are finished with decorative aluminum louvers.
- The material palette consists of masonry and glazing. Masonry includes brick and stone which are used in conjunction with projecting wall planes to emphasize the articulation of the massing. Vertical surfaces of the facades are broken up with horizontal lintels of masonry which also help establish the line of the second story.

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SOCIAL AND/OR ECONOMIC BENEFITS

The North Oakville East Wastewater Pumping Station is a significant project in terms of its presence in the community. Having a public utility building situated within a community can be perceived as deterring from the appeal of a neighbourhood. The project team's objective was to create a design that met the functional requirements of the building on a site that is aesthetically pleasing and maintains the heritage character of the community.

Building massing was developed to complement the surrounding environment, add visual appeal and create an appropriate relationship with the street. The station provides an appropriate built form and massing in that the apparent bulk of the building is reduced with articulated roof lines, and the height is appropriate in terms of the street right-of-way. The following are some of the measures implemented to allow the building to blend seamlessly within the existing community while also emphasizing pedestrian comfort:

- Site planning focused on strong built-form relationships to the street and compatibility with both the existing and future planned built-form patterns;
- Architectural treatment and materials were selected to complement the residential nature of the house-form buildings to the south of the project;
- Visibility of the utilitarian functions of the building, such as the service and loading areas, were minimized through the use of landscaping that acts as a buffer between these areas and the street;
- Design elements were used to help articulate the building facades; and
- A naturalized landscape was created using native, hardy species to enhance bio-diversity and wildlife habitat.

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ENVIRONMENTAL BENEFITS

The original project site was largely undeveloped with no discernible natural features except for some trees. Despite being very close to the work area and approved for removal, the majority of the trees were protected and left in place during construction. The site was also identified as a nesting location for the bobolink and eastern meadowlark grassland birds, both threatened species in Ontario. A custom built wood bird house, which serves to attract birds and provide a nesting/breeding habitat, was erected as part of the landscaping plan.

Sustainability has been integrated through the use of a pervious driveway and parking area. Below-grade rainwater tanks were also installed as part of the site's stormwater management plan. The building incorporates many sustainable materials including the roof shingles which are manufactured with used tires and contain 95% recycled content.

Site sustainability objectives have been implemented to reduce surface runoff, treat storm water prior to discharge, maximize vegetation cover to reduce the urban heat island effect, reduce grounds maintenance costs and use recycled materials. Porous paving was used on all hard surfaces and the balance was landscaped with a palette of 'layered' plantings: tree canopy, shrubs massing and herbaceous plants to maximize infiltration and reduce runoff. To mitigate water quality, bioswale and runoff, storage tanks were also implemented to remove impurities and reduce discharge into the municipal system.

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MEETING THE CLIENT'S NEEDS

The North Oakville East Wastewater Pumping Station has been operating successfully since November 2013. The services provided on this project were completed to the satisfaction of the client and the overall objectives of the project were met within the final approved budget and timeframe.

The North Oakville East Wastewater Pumping Station provides a streetscape treatment that is consistent with the vision and principles of the North Oakville Urban Design and Open Space Guidelines for Dundas Street. It is a necessary element in the provision of sanitary services to the existing North Oakville communities and has been designed to adapt to increased wastewater flows throughout the area. It meets the functional need of the area while also creating an attractive streetscape that is compatible with its surroundings and appealing to the public realm. The streetscape is based on a well-defined concept addressing criteria for function, design, and maintenance while at the same time enhancing the urban character of the public.

In 2013, the Region of Halton was recognized for this project when it was awarded the Town of Oakville's Livable by Design Citizen's Choice award. These awards celebrate urban design, heritage preservation and sustainable building excellence, and recognize those who have developed well-designed and executed projects. In the fall of 2014, AECOM and Halton Region received further recognition for this project when it was awarded the Ontario Public Works Association Project of the Year Award in the category of Structures, $10 to $50 Million.

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