

# 2021 Canadian Consulting Engineering Awards WEST NIAGARA SECONDARY SCHOOL AND NEW RIDGEVIEW GARDEN CENTRE

Submission Category: Environmental Remediation





ASSOCIATION OF CONSULTING ENGINEERING COMPANIES CANADA



Postcard showing Grimsby Brick and Tile in background, circa 1940s (Source: F.H. Leslie Limited - Windfield Photographic Collection and Archives, online)

# **ABOUT THE PROJECT**

#### SITE HISTORY

From 1875 to the 1970s the Grimsby Brickworks / Beamsville Brick & Tile Company operated a shale quarry and coal-fired and wood-fired brick kilns on the east side of the property located northwest of the intersection of Durham Road and King Street (Highway 8) in Grimsby, Ontario. The brickworks manufactured clay bricks and agricultural drainage tiles until it was demolished, and its remnants buried where it had stood for nearly a century. The quarry operation was derelict for several decades, into the early 1980s.

In 1984, the property was purchased and has operated as a local family business, the Ridgeview Garden Centre, a landscaping and produce market. The former quarry area and the original pond/wetland area were subsequently infilled with various types of material to bring the surface up to the surrounding grade. From May to October 1994, a large quantity of construction and demolition waste, that included shredded construction, demolition waste, and shredded wood, was received from Harbour Front Recycling Inc. (HFR) of Burlington, Ontario and placed in the abandoned quarry (Part 1 and Part 2). Due to complaints of improper waste disposal, the Ministry of the Environment investigated and subsequently issued a Director's Order for the site in 1997 amid concerns of an impact to the natural environment.



#### PRESENT DAY

In 2017, the District School Board of Niagara (DSBN) approached Ridgeview with an offer to purchase the western portion of the property (Part 1 and Part 4) to develop and build the new West Niagara Secondary School, tapping the potential of this underutilized property. Ridgeview Garden Centre will be relocated to the eastern half of the property. While this brownfield site sits within a Greenbelt, it is directly adjacent to the Grimsby Settlement Area, surrounded by multiuse commercial, residential, and institutional properties. Redevelopment of this site helps minimize urban sprawl and maintain the integrity of the Greenbelt. Our role was to remediate and prepare the site for its twin purposes as an educational property and a commercial garden centre.

To facilitate the redevelopment, the waste was removed to a licensed landfill, and impacted soil (brickworks and other quarry fill) was extracted from the new school building footprint.

The new school will replace a couple of older high schools in Grimsby, Beamsville, and Smithville, accommodating approximately 1,500 students. It is expected to open its doors in September 2022.





HFR waste destined for landfill 2019-06-12 (Source: Budget Environmental)



HFR Excavation (Source: WSP)

### **INNOVATION**

In 2017, the District School Board of Niagara (DSBN) purchased the property with an extensive site history to build a new secondary school. The site activities dated to 1875 and included a former brickwork that was demolished with its remnants buried on site and a shale quarry infilled with construction and demolition (C&D) waste. The historical land left the site burdened with poor quality soil and approximately 140,000 cubic metres of waste.

Given the challenges with previous site characterization data, DSBN retained WSP to complete an updated Phase I and II ESA including the filing of a Record of site Condition (RSC) for the site. The results of the Environmental Site Assessments (ESAs) showed a complex site with multiple challenges.

Based on the historical documentation, 73,000 tonnes of C&D waste was estimated. On the east side of the quarry, unanticipated thin ribbons of waste were discovered leading to a secondary, deep area of waste. The final volume of C&D waste was approximately 170% of the original estimate.

The soil originally used to cap the waste was also impacted with polycyclic aromatic hydrocarbons (PAHs). The Ministry of the Environment, Conservation, and Parks (MECP) had previously documented the cap material to be environmentally non-impacted, having been sourced on-site from outside of the former quarry area. This added an unexpected 73,000 m<sup>3</sup> of soil requiring risk management on-site.

Rather than landfilling the cap material and existing quarry fill that was determined to not be suitable on-site, an off-site receiving facility accepted and reused approximately 100,000 m<sup>3</sup> of soil. While additional effort was needed in soil characterisation (in compliance with the receiving facility's CPU), processing and tracking, this resulted in a solution that was sustainable and diverted soil from landfills.

2,000 tonnes of slag were present on-site, mixed with about 10,000 tonnes of soil and concrete. The mixed-slag stockpile was screened and crushed appropriately for re-use (fine-grained particles from the stockpile were screened out and treated as contaminated soil to be managed accordingly). The larger-sized slag and crushed concrete were used as a prescribed aggregate base for the new cover-all building behind the new Ridgeview Garden Centre.

A motivated proponent (the DSBN), the Ministry of Education, previous site owner Ridgeview Garden Centre, and the MECP District Officer have enabled the remediation and redevelopment of the site to successfully move forward, achieving significant environmental improvement by removing the construction waste and properly managing contaminated soil and significantly enhancing the use of the land.



Original pond/wetland area of the site



Project site with pond/wetland shown in the top left-hand corner

### COMPLEXITY

### HIGHLIGHTS OF PROJECT WORK AND CHALLENGES

HFR Waste	—	Based on the historical documentation, 73,000 tonnes of HFR waste was estimated.
	—	On the east side of the HFR area, unanticipated thin ribbons of waste were discovered leading to a secondary, deep area of waste that continued eastward up to the on-site pond and the East Stream.
	_	The final volume of HFR was approximately 170% of the original estimate.
Soil Cap	_	The soil that had been used to cap the HFR waste, that was previously documented by the MECP to be clean soil (having been sourced on-site from outside of the former quarry area), was also impacted with PAHs.
	_	This added an unexpected 73,000 m <sup>3</sup> of impacted soil requiring risk management on-site.
Historical Quarry Fill	_	Soil quality data on the underlying historical quarry fill was not well documented.
	—	Upon excavation, the historical quarry fill was found to contain deleterious material and was geotechnically unsuitable for future use on the site
	—	A further 80,000 to 110,000 m <sup>3</sup> of soil now required management. Site design could not accommodate all this excess soil on-site, so another solution was required.
	_	WSP were able to locate a property in Hamilton, Ontario, which has dispensation from the MECP (via CPU) to accept fill soil of this quality for subgrade application. An excess soil management plan and a soil and ground water management plan were completed to successfully transfer large volumes of soil between projects, and much of the excess soil has been reused at this off-site location.
Off-Site Soil Management	_	Rather than landfilling the cap material and existing quarry fill that was determined to not be suitable on- site, an off-site receiving site was secured which was able to accept and re-use approximately 100,000 m <sup>3</sup> of soil.
	—	While additional effort was needed in soil characterisation (in compliance with the receiving facility's CPU), processing, tracking, this resulted in a solution that was sustainable and diverted soil from landfills.
Former Orchard	_	DDE found in shallow soil in the former orchard area (north portion of Part 4). Due to significant budget increases, extensive collaboration between DSBN, the geotechnical engineer, and WSP exploring alternative options to satisfy the environmental and geotechnical requirements for the future sports fields area at the school.
	_	Since an orchard can be classified as an agricultural land use, an RSC was not required to change from an agricultural to an institutional land use. Therefore, the orchard was surveyed as a separate part of the site, so that an RSC could be filed for the remaining portions of the school site only, which was last used as a garden centre. In doing so, the impacted soil on the orchard portion can be efficiently managed through use of the new soil management tools available through O. Reg. 406/19 (On-site and Excess Soil Management) or via due diligence risk assessment and management. This work is ongoing.





Project site working along side the working Ridgeway Garden Centre

### HIGHLIGHTS OF PROJECT WORK AND CHALLENGES...continued

Slag		2,000 tonnes of slag were present on-site, mixed with about 10,000 tonnes of soil. The mixed-slag stockpile was screened and crushed appropriately for re-use (fine-grained particles from the stockpile were screened out and treated as contaminated soil to be managed accordingly, the larger-sized slag and crushed concrete were used as a prescribed aggregate base for the new cover-all building behind the new garden centre.
Tenant Operating On- Site	_	As part of the purchase agreement, DSBN agreed to allow the Ridgeview Garden Centre to remain open throughout remedial efforts.
	_	An intricate dance of shunting material around the site was performed so as to not unduly interfere with the Garden Centre operation.
Infilling of Former On-Site Pond	_	The on-site pond located east adjacent to the site was infilled using cap material and existing quarry fill (as part of on-site management of impacted soil). Approvals from DFO, MNRF, NPCA, and MECP were obtained.
Environmental Site Assessments	_	Following extensive historical work on-site and given challenges with previous older characterization data, DSBN retained WSP to complete an updated Phase One and Two ESA including the filing of an RSC for the site. The RSC was filed with the MECP on June 11, 2020, confirmation number 44459521.
Regulatory Liaison	_	High visibility project with numerous regulatory stakeholders Extensive communication and collaboration with: Town of Lincoln, Town of Grimsby, Regional Municipality of Niagara, MECP, DFO, Niagara Peninsula Conservation Authority, and the MNRF.



HFR Excavation (Source: WSP)

### SOCIAL AND/OR ECONOMIC BENEFITS

"Each school is working to support a successful transition for students and to celebrate the many years of service the Grimsby and Beamsville buildings have given to the community," said Helen McGregor, Superintendent of Curriculum and Student Achievement, 9-12.

#### THE FUTURE LANDSCAPE

#### West Niagara Secondary School

West Niagara Secondary School will serve students and families in the towns of Grimsby, Lincoln, and West Lincoln and is scheduled to open in September of 2022.

It will be a state-of-the-art facility that brings the best learning opportunities to all students. It will combine the specialized programs from the current schools-Beamsville District Secondary School and Grimsby Secondary School-and add to that based on student choice and voice. This set of programs will include French Immersion, Specialized School to Community and Specialized School to work. WNSS will offer a wide range of technological subjects including Hospitality and Tourism, Horticulture, Computer Technology, Health Care, Transportation (auto), Construction (wood), Manufacturing and Welding, Design, TV and Video, Food Processing and Cosmetology (hair and esthetics) – all offered within brand new facilities. The academic offerings will be extremely diverse and provide the learning that students want and need to gain entrance to and succeed in the best post-secondary pathways - colleges, universities, apprenticeships, the workplace, or the community. The new centrally located West Niagara Secondary School will comprise 60 classrooms that will accommodate more than 1,500 students from the towns of Grimsby, Beamsville, and Smithville. The school will be easily accessible by transit and close to other facilities such as the YWCA, incorporating a more community feel, with knock-on effects felt throughout the community. For those students required to take the Niagara Student Transportation Services, the new school location will keep bus ride times to a minimum. With the school being located on 8 hectares, the surrounding land will also provide enough space for an athletic field and running track, as well as ample parking.

#### **Ridgeview Garden Centre**

The revitalized Ridgeview Garden Centre will reopen, having shifted its location only a few hundred metres along King Street to maintain ease of access for the patrons of this family-owned, family-operated business.

"The DSBN will be working to establish community partnerships to enhance the school and provide students with even more opportunities to pursue their interests and support their success." Warren Hoshizaki, DSBN Director of Education, DSBN News Release online, February 26, 2019



Existing Ridgeview Garden Centre (Source: Ridgeview Facebook page)



Excavation and Ridgeview Garden Centre (Source: Budget Demolition)

### **ENVIRONMENTAL BENEFITS**

The environmental benefits of the project include:

- In redeveloping this former industrial site, DSBN has improved the local environment, reduced urban sprawl, and with the New West Niagara Secondary School in a central location means less travel time to get to school, reducing CO2 emissions, and making for a generally safer and healthier Niagara.
- Resolution of long-standing MECP Order when 140,000 m3 of HFR waste was removed from the site to licensed landfill.
- 205,000 m3 of impacted soil has been sequestered and is being appropriately managed (via site-specific risk assessment and Certificate of Property Use, in the process) on the eastern portion of the site, under the new Ridgeview Garden Centre.
- 100,000 m3 of impacted soil was reused off-site at a property that has dispensation from the MECP to accept fill soil
  of this quality for subgrade application. This means that 0 m3 of soil was sent to landfill.
- 16,000 m3 of orchard soil is being appropriately managed in place. The DDE contaminated shallow soil layer was sent to the off-site property above. Options for the remainder of the soil is being explored and could be used under the track field area. This work is ongoing.
- 2,000 m3 of slag and crushed concrete was separated from,8,000 m3 of soil and has been reused on-site as aggregate.
- By removing the constructed pond, allowed for the stream, on the east side of the site, to return to a more natural function.



Rendering of the new West Niagara Secondary School (Source: CS&P Architects)

# **MEETING THE NEEDS OF THE DSBN**

#### COLLABORATION ACROSS SECTORS

A motivated proponent (the DSBN), the Ministry of Education, Ridgeview Garden Centre, and the MECP District Officer have enabled the remediation and redevelopment of the site to successfully move forward in a tight timeline, achieving significant environmental improvement by removing the HFR waste, properly managing contaminated soil, and significantly enhancing the use of the land.

A strong partnership between all stakeholders and WSP was forged to maintain project schedule, overcome challenges along the way, and achieve a positive outcome. It was required to keep Ridgeview Garden Centre in operation during the remediation and redevelopment which required an intricate dance of shunting material around the site in order to not interfere with the business.

As a multidiscipline consulting firm, WSP was also able to accommodate additional client requests with respect to assessments of noise and vibration, air quality, and land use compatibility for the new WNSS.

Our repeat clientele relies on our Qualified Personnel (QPESA|RA) to provide environmental remediations and coordination of field programs with a successful outcome to their project challenges.

The Ministry of Education has worked closely with the District School Board of Niagara and local municipalities to ensure the project meets the needs of families and students.

"Our Government is committed to providing first-rate learning environments to students across Ontario. We know this investment will support the community of West Niagara, serving as more than a school but also as a gathering place for families for generations to come."

Lisa Thompson, Minister of Education, Niagaraatlarge.com, February 18, 2019



Partially remediated site, existing Ridgeview Garden Centre in operation in background 2019-09-24 (Source: Budget Environmental)



Road signage for new school (Source: WSP)

# **PROJECT SUCCESS (CONCLUSION)**

#### PROJECT ACHIEVEMENTS TO DATE

- 140,000 m<sup>3</sup> of HFR waste was been removed from the site to licensed landfill.
- 205,000 m<sup>3</sup> of impacted soil has been sequestered and is being appropriately managed (via site-specific risk assessment and Certificate of Property Use, in the process) on the eastern portion of the site, under the new Ridgeview Garden Centre.
- 16,000 m<sup>3</sup> of DDE-impacted orchard soil is being appropriately managed in place.
- 2,000 m<sup>3</sup> of slag and crushed concrete was separated from 8,000 m<sup>3</sup> of soil and has been re-used as aggregate.
- 100,000 m<sup>3</sup> of impacted soil was reused off-site.
- 0 m<sup>3</sup> of soil was sent to landfill.
- The western portion of the remediation area has been backfilled with aggregate in preparation for construction of new West Niagara Secondary School main school building.
- Documentation to remove the MECP Order and RSC being finalized/reviewed by MECP
- On the new Ridgeview portion of the site, redevelopment is underway for new Ridgeview Garden Centre (decommissioning on-line pond and realigning the stream to a natural setting, establishing a new off-line pond, site grading).

"There are few things that energize a community more than a new school...It will provide students with many more pathways to success and we appreciate the support of the Ontario Government in moving this important project forward."

Doug Newton, DSBN Trustee for West Lincoln and Wainfleet, DSBN News Release online, February 26, 2019