18 April 2018

ARCHAEOLOGICAL IMPACT ASSESSMENT PERMIT REPORT

School District 40 (New Westminster) Heritage Investigations for the New Westminster Secondary School Replacement Project, New Westminster, BC

Heritage Conservation Act Permit 2016-0377
Seyem' Quantlen First Nation Heritage Inspection Permit SQ 2017-43
Squamish Nation Archaeological Investigation Permit 16-0170
Stó:lō Heritage Investigation Permit 2016-143
Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094

Submitted to:
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REPORT

Report **Number:** 0714120151-629-R-Rev0-16705

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Executive Summary

At the request of School District No. 40 (New Westminster), Golder Associates Ltd. undertook an archaeological impact assessment of archaeological site DhRr-233, in support of the development of a new secondary school (the New Westminster Secondary School Replacement Project) on School District No. 40 property located at 735 Eighth Avenue (Lot 3, District Lot 2055, and DL5678, Plan EPP17131, Group 1, New Westminster District, NwID 1185900), New Westminster, BC. The Project Area does not include the School District No. 40 property located at 835 Eighth Street, which is designated a Place of Interment under the *Cremation Interment and Funeral Services Act*.

The objectives of heritage investigations were to: (1) identify, record, and assess heritage features, including gravesites; (2) identify and evaluate possible impacts of the proposed school replacement to these features; and (3) recommend appropriate impact management actions. The archaeological impact assessment was conducted in general accordance with the 1998 *British Columbia Archaeological Impact Assessment Guidelines* developed by the Archaeology Branch of the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development.

No human remains or materials associated with burials were identified. Historical debris was identified in boreholes and mechanical excavations, but recovered artifacts were determined to have low significance, as they do not meet the criteria established in the British Columbia Archaeological Impact Assessment Guidelines (1998:13, 52).

Heritage investigations consisted of two approaches: (a) mechanical test excavations (2016); and, (b) geotechnical and geo-environmental borehole monitoring (2016 and 2017). The heritage investigations were conducted by Golder Associates Ltd. personnel and First Nations field technicians on the dates indicated in the Table below and reported in two interim reports, summarizing results of investigations for 2016 and 2017, respectively.

Table: Summary of Heritage Investigations Conducted under Permit 2016-0377

Interim Report No.	Interim Report Title	Assessment Date(s)	Personnel
1	Heritage Investigations for the New Westminster Secondary School Replacement Project (Conducted in 2016)	14 November to 9 December, 2016	**Golder Archaeologist**: Charles Moore, Andrew Mason, Meng Ying, Ryan Sagarbarria, Lindsay Foreman, Melody Reich, Grant Takasaki **Field Technicians:** Joey Antone (Seyem' Qwantlen) George Chaffee (Kwikwetlem First Nation), Mike Cook (Semiahmoo First Nation), Darryl Guss (Tsleil-Waututh Nation)
2	New Westminister Secondary School Subsurface Investigations Monitored in 2017	22 March to 23 August 2017	**Golder Archaeologist**: Meng Ying, Ryan Sagarbarria, Grant Takasaki, Jonathan Duelks **Field Technicians:** Dale Wadsworth (Seyem' Qwantlen), Shane Stubbington (Seyem' Qwantlen), Joey Antone (Seyem' Qwantlen), Will George (Tsleil-Waututh Nation)

Impact Management Recommendations

Given that the heritage investigation program did not identify any areas used for burials, or human remains or historic materials and features associated with cemetery use, no further archaeological investigations are recommended prior to development of the replacement school (in Investigation Areas B and C), provided that development impacts do not extend into areas of DhRr-233 where subsurface tests have not been conducted (e.g., Investigation Area A).

Should proposed development extend into Investigation Area A (or parts of the arena corridor that are within the site boundary of DhRr-233), Golder recommends that an archaeological impact assessment be conducted with test locations based on geophysical imagery to investigate the possible presence of gravesites, material associated with cemetery use and scattered human remains, prior to subsurface construction activities taking place.

Records indicate there have been extensive impacts to the cemetery areas known to have formerly existed within or adjacent to the Project Area. The extent of some of these impacts is also evident in the archaeological record. As a result, despite the negative results of investigations, Golder recommends implementing the following heritage management recommendations over the duration of the school replacement project, to be detailed in a future Archaeological Management Plan.

Chance Find Management

To address the potential of finding intact or fragmentary human remains or burial-related historical material during construction, Golder recommends the development and implementation of a Chance Find Management Procedure for use by School District 40. The objectives of this Procedure include the preservation and proper management of heritage resources that are unexpectedly encountered during school replacement activities. This will also minimize disruption to construction activities and scheduling. The document will include both general guidelines and detailed steps to follow for the appropriate response to the discovery of known or suspected archaeological materials, including human remains or grave goods, during the course of school replacement activities. In addition to providing instructions for construction crews, it will include a list of important contacts and telephone numbers for reference.

Heritage Conservation Act Permitting

Following advice from the Archaeology Branch and to address the possible need for additional archaeological testing, as well as the potential for encountering fragmentary human remains and to allow for archaeological monitoring, valid *Heritage Conservation Act* permits (section 12 and section 14) will be in place during construction. Having the permits in place would likely allow for the timely implementation of appropriate resource management procedures in the event that such remains are encountered anywhere in the Project Area.

Archaeological Monitoring

As an added precaution, archaeological monitoring by a qualified archaeologist is recommended under terms of the *Heritage Conservation Act* permit during construction-related activities that may result in subsurface disturbance of the historical fill, primarily within Investigation Areas A and B with a buffer extending 20 m from DhRr-233 into Investigation Area C. Based on the negative results of the archaeological impact assessment, monitoring would not be required at all times during these activities, but may be implemented on occasion according to development plans (particularly proposed depths for excavations), following comparison to recorded depths of imported and historical fill, per guidance developed in the Archaeological Management Plan, and through on-going discussions with the Archaeology Branch and School District 40 when and where potentially more sensitive areas are being impacted.

Revisit Archaeological Site Boundary

At the conclusion of the Project, when all the archaeological results are available, (including from monitoring and possible chance finds during construction), the boundary of site DhRr-233 should be reviewed taking into account the areas where any cemetery-related material may have been found archaeologically and those untested areas with potential for the presence of burials.

Glossary of Technical Terms

Many terms and abbreviations used throughout this report have historical, anthropological or archaeological significance and may be unfamiliar to non-specialists. These terms are defined below. In addition, this list also defines frequently used abbreviations. A more detailed glossary is included in Appendix A.

Term / Abbreviation	Definition
AIA	See Archaeological Impact Assessment.
Anthropogenic	Anything derived from human agency, as opposed to anything occurring in natural environments without human influence.
Anomaly	A signature identified in the geophysical data (see EM and GPR) that exhibits contrasting characteristics in a localized subsurface area with the surrounding soil. For the purposes of this study anomalies have been further characterized as follows: • Strong: an anomaly with high contrast to ambient material, possibly including metallic characteristics. • Subtle: an anomaly with low to moderate contrast with ambient soil. • Primary: a judgemental assessment of an anomaly that should be prioritized for testing based on specific characteristics, location and results in previous tests for sampling purposes. • Alternate: a judgemental assessment of an anomaly as an alternate or second tier of prioritization for sampling purposes that may become a priority for testing depending on on-going results.
Archaeological Impact Assessment	A study to assess for potential conflicts between known archaeological sites or areas with the potential to contain archaeological resources and a proposed development. Sites are located and recorded, site significance is evaluated, and the nature and extent of expected impacts are assessed. Recommendations to mitigate potential project effects on sites are provided.
Archaeological Site	A location that contains physical evidence of past human activity and that can be studied by archaeological methods of investigation, including site survey, excavation, and data analysis.
Archaeology	The study of human societies using the material remains of their behaviour. Some objectives of archaeology are to construct culture history, reconstruct past lifeways, and study cultural processes.
Artifact	A portable object made, modified, used, or transported by humans; includes finished objects, waste products, and unmodified raw materials.
Basal	Referring to the bottom, specifically the bottom of a test pit, and the basal sediments typically comprised of undisturbed natural silts.
Below Surface	Beneath the ground surface.
Borden Number	A unique archaeological site number composed of four letters and one number (e.g., DhRt-5) based on the longitude and latitude of the location.
CIFSA	*Cremation Interment and Funeral Services Act.*
Cultural Deposit	Accumulated sediments directly produced or modified as the result of human activity. Typically comprised of stratified layers of anthropogenic soils, charcoal, ash, fire-altered rocks, faunal remains, and artifacts.
Cultural Remains	Includes archaeological deposits (surface and subsurface) as well as features, structures and objects.

Term / Abbreviation	Definition
DBS	Depth below surface (of the ground).
EM (Conductivity Mapping)	Electromagnetic Conductivity Mapping; a geophysical method that consists of generating and measuring electromagnetic fields which are affected by ground constituents, including: soil/rock type, porosity, soil moisture content and mobile ion concentrations, and buried metal. For this Project, EM was used to produce map-view images for locating buried features of interest and areas of different ground types/conditions. This method is discussed in more detail in the report.
Exhumation	The digging up or removal of something generally buried and is used to describe removing human remains from a grave or vault for the purpose of examination or reburial at a different location.
Faunal Remains	The remains, typically bone, of animals discovered in an archaeological context.
Feature	Non-portable archaeological remains such as hearths or post holes, or grave shaft.
Geotechnical	A branch of civil engineering concerned with the engineering behaviour of earth materials.
Geo-environmental	The application of engineering principles to subsurface contamination, to protect the environment and human health.
Geophysics	Study of physics of Earth (e.g., gravity, geomagnetism, tectonophysics, and seismology) and using physics to image Earth's interior based on contrasts in physical properties of earth materials and buried objects.
GPR	Ground penetrating radar; a geophysical method that emits electromagnetic pulses into the ground and measures resulting radar reflections from soil layering and buried objects. The resulting profile is a high resolution cross-sectional image of subsurface layering and a wide variety of natural or artificial buried features. This method is discussed in more detail in the report.
Grave Shaft	The pit excavated for a burial. The column of backfilled soil may remain visible in GPR or in subsurface tests.
Gravesite	A location where a human burial likely occurred, whether or not human remains are still present within the grave.
Ground-truth	Identification through visual inspection, following excavation or other means necessary for direct access, of an anomaly previously observed in geophysical data.
HCA	See *Heritage Conservation Act*.
Heritage	Any structure, object, site, quality, or thing that is considered of historical or archaeological significance by a community or people.
Heritage Conservation Act	The provincial Act that provides for the protection and conservation of heritage sites and objects within BC. All archaeological sites, whether or Provincial Crown or private land, including land under water, that predate AD 1846 are automatically protected under the HCA. Certain sites, including human burials and rock art sites with heritage value, are automatically protected, regardless of their antiquity. The HCA does not distinguish between those archaeological sites which are "intact" (i.e., those sites which are in a pristine, or undisturbed state) and those which are "disturbed" (i.e., those sites which have been subject to alteration, permitted or otherwise). All archaeological sites, regardless of condition, are protected by the Act, as described above.
In Situ	An object in its original position, that is, not disturbed.
Interment	The burial of human remains.
NWSS	New Westminster Secondary School.
Pauper's Field	See Potter's Field.

Term / Abbreviation	Definition
Post-Contact	See Contact.
Potter's Field	A place for the burial of unknown or indigent people.
Pre-Contact	Related to indigenous populations from before contact with settler communities, arbitrarily set at 1846 in British Columbia.
Project	New Westminster Secondary School Replacement Project.
Project Area	The area under investigation in this report is illustrated in Figure 2.
Provincial Heritage Register	A centralized listing of protected heritage sites and objects located in BC.
SD40	British Columbia School District 40, located in New Westminster.
Signature	The overall variation in geophysical data that may be associated with specific subsurface conditions, or objects, that are different (anomalous) compared to background readings.
Site Inventory Form	A form used by the Province of BC to document archaeological site information in a consistent and standard format.
Subsurface Testing	A method used by archaeologists to locate and identify subsurface archaeological remains (e.g., shovel testing, machine testing).
Stratigraphy	In the context of this report, it refers to the vertical subsurface layering of soil and rock layers or horizons.

Table of Contents

TABLES

FIGURES

APPENDICES

Credit Sheet

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Permit Report Authors	Charles Moore
	Ryan Sagarbarria
Senior Technical Review	Andrew Mason

Field crew participation is summarized in the following Table.

Table: Field Crew Roles

Crew Member	Role	Affiliation	Dates of Participation
Charles Moore	Field Director	Golder Associates	23-25, 28-29 November, 5, 7-8, 12-13, December 2016
Andrew Mason	Field Director	Golder Associates	30 November; 1-2 December 2016.
Meng Ying	Field Supervisor	Golder Associates	5, 7-8, 12 December 2016; 1 June; 20 July, 14-16 August 2017.
Ryan Sagarbarria	Field Supervisor	Golder Associates	17-18, 21-25, 28-30 November; 1-2,13 December 2016; 30-31 May, 2,8,9, 22 June, 10, 12 July 2017.
Lindsay Foreman[1]	Field Supervisor	Golder Associates	23-25, 28-30 November, 1-2, 5, 7-8, 12-13 December 2016.
Melody Reich[2]	Field Supervisor	Golder Associates	23-25, 28-30 November, 1-2, 5,7 December 2016.
Grant Takasaki[3]	Field Supervisor	Golder Associates	23-25, 28 November, 8, 12-13 December 2016; 22 March 2017.
Jonathan Duelks[4]	Field Supervisor	Golder Associates	23 August 2017.
George Chaffee	Field Assistant	Kwikwetlem First Nation	17-18, 23-25, 29 November, 13 December 2016.
Mike Cook	Field Assistant	Semiahmoo First Nation	28-30 November 28-30; 1-2, 5, 7-8, 13 December 2016.
Joey Antone	Field Assistant	Seyem' Qwantlen	17-18, 21, 23-25, 28-30 November, 1-2, 7, 13 December 2016; 30 May, 9 June 2017.
Shane Stubbington	Field Assistant	Seyem' Qwantlen	30-31 May; 1-2 June, 16 August 2017
Dale Wadsworth	Field Assistant	Seyem' Qwantlen	8 June, 10, 12 July 2017
Will George	Field Assistant	Tsleil-Waututh Nation	14, 15 August 2017
Darryl Guss	Field Assistant	Tsleil-Waututh Nation	23-24, 28-30 November; 1, 7-8, 12-13 December, 2016

[1] Field Director In-Training: November 23-25, 28-30; December 1-2, 5, 7-8, 12-13, 2016.

[2] Field Director In-Training: November 23-25, 28-30; December 1-2, 5, 7, 2016.

[3] Field Director In-Training: December 12-13, 2016. March 22, 2017.

[4] Field Director In-Training: August 23, 2017.

1.0 INTRODUCTION

At the request of School District No. 40 (New Westminster), Golder Associates Ltd. (Golder) undertook an archaeological impact assessment (AIA) of archaeological site DhRr-233, in support of a new secondary school (the New Westminster Secondary School Replacement Project) on School District No. 40 (SD40) property located at 735 Eighth Avenue (Lot 3, District Lot 2055, and DL5678, Plan EPP17131, Group 1, New Westminster District, NwID 1185900), New Westminster, BC (Figure 1). The Project Area does not include the SD40 property located at 835 Eighth Street, a property which has been designated a Place of Interment under the *Cremation Interment and Funeral Services Act* (CIFSA) (Figure 2).

Heritage work included: (1) geotechnical and geo-environmental borehole monitoring within and immediately adjacent to the area of archaeological site DhRr-233; and (2) mechanical testing of identified geophysical anomalies to determine the presence/absence of human remains and/or buried evidence of historical cemetery use within the Project Area and DhRr-233. This report summarizes the results of the AIA work within the Project Area (Figures 1 - 8) completed under Permit 2016-0377 between 14 November 2016 and 23 August 2017, and are listed below in Table 1.

Table 1. Proposed Project Summary

Interim Report No.	Title	Appendix	Assessment Date(s)
1	School District 40 (New Westminster) Heritage Investigations for the New Westminster Secondary School Replacement Project New Westminster, BC, AIA Interim	A	calendar year 2016
2	New Westminister Secondary School Subsurface Investigations Monitored in 2017	B	calendar year 2017

1.1 Project Objectives

The AIA was conducted in general accordance with the 1998 British Columbia Archaeological Impact Assessment Guidelines (Guidelines) developed by the Archaeology Branch of the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development. The objectives of the investigations were to: (1) identify, record, and assess heritage features, including gravesites and materials that might be associated with burials; (2) identify and evaluate possible impacts of the proposed school replacement to these features; and, (3) recommend appropriate impact management actions.

The specific goal for the heritage investigations was to assess which areas of the archaeological site and permit area were potentially used as burial areas, and which areas were not. The process of study was to first survey the available areas by non-intrusive means (geophysical study), and then selectively conduct subsurface tests to sample locations of interest observed in the geophysical imagery, to identify the nature of these locations, detailed as follows:

- Identify through geophysical survey (including electro-magnetometry and ground-penetrating radar [EM and GPR]) image patterns, or signatures, which are locations of interest, including those which potentially represent historic-period (post-contact) gravesites.

- Conduct select subsurface inspections by excavating with machine and by hand to assess the nature of the locations of interest.
- Delineate, through a review of geophysical survey data and subsurface inspection results, the likely extent of historical burial areas within the permit area.

In the event of the discovery of an intact gravesite, an objective was to keep disturbance to a minimum. No recovery of any burial was planned, but the gravesite would be mapped in place and reburied, pending consultation with stakeholder groups, First Nations and the Archaeology Branch. Collection of human remains would be limited to previously disturbed remains (scattered by historical activity) recovered during overburden removal.

2.0 PROPOSED PROJECT

2.1 Project Description and Location

SD40 commenced work on the New Westminster Secondary School Replacement Project, beginning with background preparation for the Project in the mid-2000s. Following announcement of the Project's funding approval in 2016 (SD40 2016), a series of site-specific studies, including geophysical, geotechnical, geo-environmental, and heritage investigations, have taken place to further characterize the property.

Anticipated to open in September 2020, with construction starting in 2018, the new school will accommodate 1,900 grade 9 to 12 students (SD40 2018a). The new school will replace the existing school that was built in 1949. Previous historical uses of the Project Area include a public works yard, a staging area with military barracks set up during the Second World War, two isolation hospitals, and cemeteries. SD40 and the Ministry of Education have committed that no construction will take place on known burial areas.

The area under investigation in this report (Project Area) consists of approximately 6.4 hectares (ha) of grass playing field, paved lane and parking surfaces, and buildings including much of the existing New Westminster Secondary School (NWSS) (Figure 2; Appendix A Photos 1 and 2). It is located at 735 Eighth Avenue, New Westminster, BC, and is bounded by Tenth Avenue to the northwest, Sixth Street to the northeast, Eighth Avenue to the southeast, and Eighth Street to the southwest. Existing school infrastructure occupies most of the western portion of the block between Sixth Street and Eighth Street (Figure 2). With the exception of strips extending within the current road right-of-ways to the corner of Tenth Avenue and Eighth Street, archaeological site DhRr-233 is contained within the Project Area. The Project Area (and the 735 Eighth Avenue property) also includes an "'L'-shaped" parcel currently occupied with playing fields and a skate park located outside of archaeological site DhRr-233 (Figure 2).

A cemetery area (2.28 ha), designated as a Place of Interment under the *Cremation Interment and Funeral Services Act* (CIFSA), lies outside of the Project Area (Figure 2). This cemetery area corresponds with the parcel 835 Eighth Street, and is also identified as historic site DhRr-401 in Appendix A. The status of the site has since changed and its current configuration is illustrated in Figure 2. The site was formally registered under Order-in-Council 2018-028 (February 5, 2018) with a polygon "drawn to include the area likely to contain the historic Chinese Cemetery" (Provincial Heritage Register 2018). This configuration of historical place DhRr-401

places it entirely within archaeological site DhRr-233, with a narrow strip overlapping the designated cemetery area (Figure 2). The change in location of DhRr-401 under section 18 of the HCA does not reflect a change in legislated protection either to the cemetery area as a Designated Place of Interment under the CIFSA, or within archaeological site DhRr-233.

The Project Area also excludes the properties occupied by Mercer Field, Moody Park Arena, and Thornebridge Gardens Retirement Community (this property is also an historical site, DhRr-51). No heritage investigations occurred in these areas (outside the Project Area) with the exception of two monitored subsurface geo-environmental tests conducted near the Moody Park Arena, with permission of the City of New Westminster. The portion of archaeological site DhRr-233 that overlaps the Project Area represents 4.14 ha and corresponds with the permit area defined in *Heritage Conservation Act* (HCA) permit 2016-0377 (Figure 2). The Project Area is further subdivided into investigation areas A, B and C, for the purposes of discussion and these are mapped in Figure 3.

Both the Government of British Columbia and SD40 made a commitment to protect and preserve the historical significance of the site and to ensure that no construction will take place on any known burial area. The 'L'-shaped parcel is where the new school is to be located (SD40 2018b). A passive park with a memorial area will be established, likely in the portion of the property that has been designated under the CIFSA (Figure 2). Through the Memorialization Advisory Committee, information will be gathered to help determine the best way to memorialize the history of the site (SD40 2018b).

2.2 Potential Impacts to Heritage Resources

In general, land-altering activities associated with the Project that could have direct adverse impacts to heritage sites may include but are not necessarily limited to:

- Subsurface investigations (i.e., borehole drilling) for geotechnical and geo-environmental purposes.
- Demolition of existing facilities and services (e.g., schools and other buildings, paved parking and roadways, underground utilities) through the use of heavy machinery and/or other means.
- Clearing, excavation, and levelling associated with the construction of proposed school buildings and associated facilities, creation of paved parking lots and roadways, and trenching for utility installation (e.g., sanitary sewer and water main).

It is expected that ground disturbance may extend to, or exceed, a depth of two metres below current ground surface in some locations.

2.3 Heritage Legislation, Polices and Permitting

The following legislation is relevant to the Project in that it applies to land within or directly adjacent to the Project Area.

2.3.1 Heritage Conservation Act

All archaeological sites located on Provincial Crown or private land that predate or are assumed to predate AD 1846 are automatically protected under the HCA. Specific site types, if they have heritage value and including burial sites are protected regardless of age. Inspection, investigation or alterations to archaeological sites require a permit issued by the Archaeology Branch, Ministry of Forests, Lands Natural Resource Operations, and Rural Development.

2.3.2 Cremation Interment and Funeral Services Act

The CIFSA is administered by the Business Practices and Consumer Protection Authority (BPCPA) and provides specific details and regulations for cremation, cemetery and funeral services in BC. It outlines the legislated process for the establishment, operation, and closure of cemeteries and crematoria. All operators or funeral providers are responsible for ensuring the place of interment or crematorium is operated in accordance with CIFSA. Relevant to this Project is Part 4 of the Act (Exhumation, Disinterment and Removal of Human Remains).

Prohibition on removal of remains

Section 19:

2) A person must not disinter or remove human remains, or any part of human remains, from the place they are interred unless the disinterment or removal is in accordance with,
(a) this Act, the *Coroners Act* and the regulations under those Acts, or
(b) a permit or an order under the *Heritage Conservation Act*.

3.0 PROJECT BACKGROUND

A summary of the Project background information reviewed including past historical uses in and adjacent to the Project Area and use of the area as a cemetery is detailed in Appendix A. This document builds on the Douglas Road Cemetery Historical Site Study (Golder 2008) and further details historic site use and archaeological site investigation work undertaken in 2016 associated with the New Westminster Secondary School Replacement Project. The extent of lands set aside for cemetery use, and the recorded locations of structures related to subsequent land use are presented in Appendix A, Figures 4, 5 and 6. The report identified five cemetery areas representing distinct operational periods as well as distinct cemetery areas as defined by their operators, cultural practices, administrative processes, and pattern of interment. Table 2 includes the five basic cemetery areas, with years of reported availability for interment, and location by site and investigation area (Figures 2 and 3).

Table 2: Cemetery Area with Years Operation and Current Status.

Cemetery Name	Interment Years	Current Location	Investigation Area
New Westminster Public Cemetery	1861 – ca. 1907	Designated Place of Interment	N/A
The ‘Old’ Chinese Cemetery	1892 – 1909	Archaeological site DhRr-233 (DhRr-401)	A and B
The Potter’s Field	ca. 1892 – ca. 1907	Archaeological site DhRr-233	A and B
Douglas Cemetery	1908 – ca. 1920	Designated Place of Interment	N/A
The ‘New’ Chinese Cemetery	1909 – 1914	Archaeological site DhRr-233 (DhRr-401)	B

Note that the Designated Place of Interment includes areas of interment available for a cumulative period of 59 years, while the 'Old' Chinese Cemetery and the Potter's Field were available concurrently for 17 years and the 'New' Chinese Cemetery area for five. The two Chinese cemetery areas, set aside at the community's request, were the only areas used by an ethnically distinct group, and the archaeological record in these areas might be expected to contain material reflecting culturally Chinese burial practices.

The New Westminster Public Cemetery was non-sectarian, however some denominations and other groups began burying their community members in areas set aside for them at the cemetery in Sapperton, beginning with the Anglicans (Holy Trinity Parish) in 1869, and continuing over subsequent years with the Wesleyans (Methodist congregation), Presbyterians (St. Andrew's congregation), Free Masons (New Westminster Masonic Lodge), Oddfellows (New Westminster's Independent Order of Oddfellows), and, finally, the Roman Catholics (St. Peter's Parish), in 1883. The New Westminster Public Cemetery had always included burials for local institutions (see full list in Appendix A) and for the last 12 years of use (at the Douglas Cemetery) the plots were divided for use between the City and Provincial institutions in the New Westminster area.

School construction, including landscaped grounds and starting in 1948, overlapped all of the cemetery areas. Previous historical uses involving land-clearing, construction and demolition included: the New Westminster Regimental Training Barracks (1939-1945, over the Douglas Cemetery and the 'New' Chinese Cemetery areas); and the new isolation hospital and City Works Yard (1912-1948, over the Potter's Field and 'Old' Chinese Cemetery areas) (see Appendix A; Figure 5 and 6).

The Douglas Road Cemetery Historical Site Study (Golder 2008) was the product of time-limited archival research undertaken at a number of repositories in the Lower Mainland and Victoria. The purpose of the study was to determine as far as possible with available records when and where burial areas were located within current school property. The study also sought records of exhumation, and found that there was nothing to suggest an organized, formal program of removal and or relocation of human remains that was implemented following official closure of the cemetery grounds in 1917, although exhumation of some burials for relocation to China occurred and applications for exhumations were being submitted on behalf of the Chinese community as late as 1919.

Based on the archival research (Golder 2008), including surveys of property boundaries, fence lines and other as-built records, and records of interments that are considered reliable in terms of location within specific cemetery areas, the boundaries of the New Westminster Public Cemetery and Douglas Cemetery were determined, and the two adjacent areas were together designated as a Place of Interment on the land under a Certificate of Public Interest (30 October 2009). This area was thereby provided legislated protection from disturbance under terms of the CIFSA.

Historical records confirms that land was set aside for burials outside of the designated area (New Westminster Public Cemetery and Douglas Cemetery), likely for the 'Old' Chinese Cemetery[5], and certainly for the Potter's Field and the 'New' Chinese Cemetery. Although it is uncertain to what extent the additional lands were actually used for burials, legislated protection under terms of the HCA for the full extent of land known to be set aside for possible burial use was provided when the archaeological site boundaries for DhRr-233 were accepted in the Provincial Heritage Register in December, 2007.

[5] The circular boundaries of DhRr-401 shown in Figure 2 represent generalized and speculative possible locations for the "Old" Chinese Cemetery.

Following the establishment of the protected areas (see Figure 2) archaeological monitoring was conducted during subsurface investigations or excavations located within the boundaries of archaeological site DhRr-233 and occasionally in adjacent areas (see section 3.2; Appendix A, Figure 7), including under this permit (Figure 4; Appendix A, Figure 10; Appendix B). Archaeological tests conducted under this permit (2016-0377) represent the first to systematically investigate the possible extents of areas used for burials within site DhRr-233. Based on historical records of subsequent land use, including land levelling and excavations for construction and demolition, the monitoring of subsurface tests, and archaeological tests addressed both the potential for scattered fragmentary material related to burials (possibly including human remains), as well as evidence of intact gravesites located within site DhRr-233.

3.1 Community Interests and Involvement

A copy of the HCA permit application was distributed widely for review and comment. This list included First Nations groups identified in the Province's Consultative Areas Database Internal Map Application, cultural groups known or suspected to have used parts of the NWSS property for burial purposes, and First Nations, community groups, or fraternal organizations with members that records indicate were interred on the land whether the interments were located within the Project Area or the dedicated cemetery area between 1861 and 1920 (Table 3). The Tsilhqot'in National Government was included given their interest in the identification and recovery of the remains of Chief Ahan who was executed in New Westminster in 1865[6]. In conjunction with the permit application referral, representatives of SD40 and Partnerships BC made telephone contact with many of the permit application referral recipients.

Table 3: Community Interests and Involvement

First Nations	Cultural Groups	Religious Organizations	Community Groups
■ Council of the Haida Nation ■ Cowichan Tribes ■ Halalt First Nation ■ Hul'qumi'num Treaty Group ■ Hwlitsum ■ Katzie First Nation ■ Kwantlen First Nation ■ Kwikwetlem First Nation ■ Lake Cowichan First Nation ■ Lyackson First Nation ■ Musqueam Indian Band ■ New Westminster Indian Band ■ Penelakut Tribe ■ Semiahmoo First Nation ■ Stó:lō Nation People of the River Referrals Office ■ Stz'uminus First Nation ■ Squamish Nation ■ Tsawwassen First Nation ■ Tsleil-Waututh Nation ■ Tsilhqot'in National Government	■ Chinese Benevolent Association of Vancouver ■ Legacy Initiatives Advisory Council (LIAC) ■ Métis Nation British Columbia ■ National Congress of Chinese Canadians ■ National Nikkei Museum and Heritage Centre (Burnaby) ■ Khalsa Diwan Society (New Westminster	■ Diocese of New Westminster, Anglican Church of Canada ■ First Presbyterian Church, New Westminster ■ Holy Trinity Cathedral, New Westminster ■ Queens Avenue United Church, New Westminster ■ St. Peter's Roman Catholic Church, New Westminster c/o Gardens of Gethsemani ■ Vancouver School of Theology	■ Canadians for Reconciliation Society ■ City of New Westminster ■ Inclusion BC ■ Union Solomon Masonic Lodge

[6] Prisoners from the New Westminster Gaol were buried at the New Westminster Public Cemetery beginning in 1879, and likely at the gaol before that date, but the burial location for Chief Ahan is not recorded.

Golder applied for and received Seyem' Qwantlen Heritage Investigation Permit SQ 2017-43, Squamish Nation Archaeological Investigation Permit 16-0170, Stó:lō Heritage Investigation Permit 2016-143, and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094. Golder also applied for a Musqueam Indian Band Agreement to Conduct Archaeological Research within Musqueam Traditional Lands, but have not received a permit at the time of writing.[7] Representatives of the Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, and Tsleil-Waututh Nation participated in field work.

3.2 Previous Archaeological Assessments

Archaeological investigations (all consisting of monitoring of geo-environmental or geotechnical boreholes, or excavations for construction) undertaken within the Project Area (and within or in the vicinity of archaeological site DhRr-233) and prior to the work conducted under HCA permit 2016-377 are listed in Table 4. The locations and extent of these investigations are also mapped in Appendix A, Figure 7.

Table 4: Previous Archaeological Assessment Conducted within the Project Area.

Title	HCA Permit
New Westminster Secondary and Middle School Project Stage 2 Preliminary Site Investigation, Archaeological Monitoring Results. Technical Memorandum Submitted to School District 40, 23 November 2007 (Golder 2007).	N/A
New Westminster Secondary and Middle School Project Detailed Site Investigation, Archaeological Monitoring Results. Technical Memorandum Submitted to School District 40, 18 February 2008 (Golder 2008b).	N/A
Assessment of Installation of Underground Electrical services and New Classroom Portables, New Westminster Secondary School, New Westminster, BC. Letter report submitted to School District 40, 2 September 2011 (Golder 2011).	N/A
School District No. 40 (New Westminster) School Facilities and Infrastructure Installation and Monitoring. Site Alteration Permit 2012-0404. Interim Report submitted to Ministry of Forests, Lands and Natural Resource Operations, Archaeology Branch, Victoria, BC (Golder 2014a).	2012-0404
City of New Westminster Archaeological Monitoring Report, Site DhRr-0233. Site Alteration Permit 2012-0393. Final Report submitted 10 March 2016, to Ministry of Forests, Lands and Natural Resource Operations, Archaeology Branch, Victoria, BC (2016).	2012-0393

As the Project Area is a relatively flat, paved and landscaped school ground in an urban setting, there are no visible features remaining to suggest previous structures or land uses, including human burials. Geophysical reconnaissance consisting of electro-magnetometry (EM) and ground-penetrating radar (GPR) has been conducted on three occasions to reveal below ground features of interest. In 2007, a reconnaissance was conducted in the parking lot within the area that is now a designated place of interment. Some geophysical anomalies were observed suggesting possible gravesites in their size, depth, and alignment (Golder 2009). In 2012, a second reconnaissance was conducted in the southwestern part of the property near the intersection of Eighth Street and Eighth Avenue (see Investigation Area A in Figure 3), as well as in part the north playing field. Some aligned geophysical anomalies were observed in the southwest corner of the property, but nothing similar was observed in the field (Golder 2014b). The areas covered by the 2007 and 2012 surveys and the locations of noted anomalies are also mapped in Appendix A, Figure 7.

[7] The Musqueam Indian Band have issued permit MIB-2017-173-AIA for subsequent archaeological work for the NWSS Replacement Project.

In 2016, Golder conducted further geophysical reconnaissance (EM and GPR) of all the accessible ground surface (i.e., pavement and grass not covered or blocked with existing buildings and other infrastructure) within the boundary of archaeological site DhRr-233 and the limits of the Project Area, and not previously subject to geophysical assessments (Golder 2017b). The areas within the Project Area subject to geophysical survey are represented by Investigation Areas A and B in Figure 3.

4.0 FIELD AND ANALYSIS METHODOLOGY

4.1 Inventory

Prior to conducting sub-surface investigations under permit 2016-0377, Golder conducted non-intrusive geophysical investigations consisting of EM mapping in Areas A and B, and GPR profiling of Area B located within site DhRr-233 (Figure 4) (Golder 2017a). The methodology is detailed in Golder (2017a) and in Appendix A (including analysis of geophysical anomalies for subsurface investigation).

Initial surveying began with EM which measured soil electrical conductivity averaged over the investigation depth. Gravesites can produce an anomalous response evident in EM imagery from caskets (including non-metallic), and/or from related metal and voids, as well as from a change in soil conditions (or type) from the back-filled soil, including potentially from the grave shaft of an exhumed burial. Once the EM imagery was reviewed, representative EM signatures were subsequently investigated by GPR to provide a cross-sectional perspective with depths and further assessment of potential burials.

Analysis of EM and GPR imagery identified 659 anomalies. Some patterns and associations with high metal content suggested many of these corresponded with buried infrastructure such as foundations, areas with high metal content (presumably buried metal debris or infrastructure), and areas that might be described as pockets or larger former depressions filled with debris. The distribution of other identified anomalies did not exhibit a clear or regular spatial pattern typical of most cemeteries. Given that any gravesites located outside of the planned Douglas Cemetery area might not be regularly laid out, other criteria for selection of potential gravesites among the anomalies were established as follows:

- EM anomaly footprint is approximately gravesite size (1 m x 2 m).
- Inferred metal response is not high (moderate to no metal response).
- Depth ranges from 0.4 to 2.0 m into what may be original ground, as determined from GPR (to include shallow burials reflective of recorded Chinese burial practices).

Interpretation of the geophysical reconnaissance results identified 38 anomalies that exhibit EM and GPR signatures that together are consistent with potential gravesites (i.e., these geophysical anomalies exhibit all of the expected gravesite criteria outlined above). In the subsurface investigation methods described below, all geophysical anomalies were avoided in the selection of geotechnical and geo-environmental test locations, where the geophysical data was available (Area B). For archaeological tests, between one and four geophysical anomalies were selected for subsurface investigation in each test. While many of the anomalies selected for investigation were thought to potentially represent gravesites, other anomalies were also selected to ground-truth a range of geophysical characteristics observed in the anomalies.

4.1.1 Monitoring of Geotechnical and Geo-Environmental Investigations

Geotechnical and geo-environmental subsurface investigations, including boreholes, hand augers and test pits, conducted within the HCA permit area were subject to archaeological monitoring. Twenty-one geotechnical and geo-environmental subsurface investigations located outside of the permit area (Area C) were also chosen for monitoring, primarily due to their proximity to the recorded archaeological site boundary in 2016 and 2017. Where geophysical data were available (Area B), borehole locations were selected to avoid geophysical anomalies (Figure 4).

Mechanical augers for boreholes were typically truck-mounted, solid stem augers, approximately six-inch or approximately 15 cm in diameter. Soil (hand) augers were used with a 7 cm diameter basket. A single geo-environmental test pit was excavated by excavator, with a length of 2.8 m and depth of by 1.5 m, subsequently backfilled.

Archaeological inspection consisted of visual observations, and selective hand sorting and screening (through ¼ inch mesh) of sediments exposed during machine assisted drilling and excavating activities. Auger flights from each monitored borehole were examined when available by the field crew to search for historic artifacts, human remains, anthropogenic soil layers and other cultural evidence. Field observations, including monitored depths, soil depths, and soil transition depths, were recorded using field notes and photographs.

Golder personnel conducting the drilling at locations outside of the HCA permit area where an archaeological monitor was not present were made familiar with the procedures outlined in the Archaeology Branch's 1999 *Found Human Remains Policy*. Seismic Cone (Piezocone) Penetration Tests, where no subsurface materials were recovered, were not monitored.

4.1.2 Mechanical Test Excavations

All subsurface mechanical test investigations (Area B) were conducted under the terms and conditions of *Heritage Conservation Act* Permit 2016-0377. Subsurface test locations were guided by the geophysical results and between one and four anomalies were investigated per test (Golder 2017a; Appendix A). Geophysical images suggested the depths required for excavations to reach various soil/fill interfaces and anomalies, and also suggested the possible nature of the sediments and of some of the anomalies (i.e., potential gravesites). The methodology specified in the HCA permit application indicated that mechanical excavation would cease and be replaced by hand removal of sediments if and when a gravesite was discovered. Testing was halted once the anomaly was identified, or sooner if the anomaly depth lay below visibly undisturbed basal levels of the test (i.e., no prior excavation including a grave shaft had been excavated below that depth).

An excavator or a backhoe was used to remove the surface and sediments at each test location. The size of each test pit was dependent on the number, size, and depth of the anomaly or anomalies identified within it. The minimum test pit size was 2 m wide by 2 m long, while the maximum was 5.6 m by 3.1 m. Toothed buckets were used to remove pavement, cobbles, and boulders prior to reaching the anticipated cultural layers. Toothless finishing buckets were used to excavate cultural and natural deposits below the sod/asphalt and fill layers. Bucket lifts ranged between 10 cm and 25 cm for all excavated materials.

Depths of the test pits varied according to the measured depths of the anomalies, observed depth of undisturbed natural soil layers, and presence or absence of observed features in the floor or walls of the tests. Test depths were typically around 1.5 m, to a maximum 2.4 m. At minimum, 25% of culture material-bearing displaced sediments (i.e., historic fill) and interpreted original surface horizon was examined, primarily by manual raking, but also by screening through 6-mm mesh, for the presence of human remains, faunal material, and historical artifacts (diagnostic artifacts were collected). Excavated material was sorted by type/layer during excavation and was replaced in the order of its excavation when the test was backfilled. Any surplus excavated soil not returned as backfill remained on site and within the archaeological site boundary.

Two teams consisting of two Golder archaeologists and up to two assistants from the Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, or Tsleil-Waututh Nation investigated each test. Observations and interpretations were recorded on forms and in notes. Each test was photographed and a selected wall was profiled. All faunal material and a sample of the diagnostic historic material culture items were collected for laboratory analysis.

4.2 Artifact Analysis

4.2.1 Faunal Remains

The recovered faunal specimens were analyzed to the most specific taxon possible by a zooarchaeologist with access to appropriate reference materials (i.e., France 2009; Gilbert 1990; Gilbert et al. 1996) and a comparative collection. Faunal specimens were described according to taxon, element, side, and any relevant cultural modifications or natural taphonomic processes. These data assist in determining site formation processes.

4.2.2 Historical Materials

The recovered historical materials were analyzed following a basic compositional approach, which includes a description of the material types (i.e., ceramic, glass, metal) and functional categories (i.e., food/beverage, structural, personal/societal) of the recovered items. Appropriate reference materials (i.e., Edwards and Wells 1993; McDonald-Taylor 1993; Polk 2013) were consulted as were comparative objects available in the Golder Archaeology Laboratory.

4.3 Historical Materials Analysis

Post-cemetery historical land use is well documented, and a highly level disturbed subsurface level observed in archaeological tests is interpreted as being the result of this historical land use. This level is identified in this report as “historical fill”, which overlies “sterile” clay deposits, but underlies layers that have been interpreted has “imported” fill. While evidence of gravesites and other indications of burial areas, including human remains, may have been absent in the archaeological tests conducted, in light of extensive post-cemetery disturbances of sediments, due diligence leads to the recognition that scattered human remains may still be present in the levels of disturbed deposits. The “historical fill”, through its supposed association with periods of post-cemetery land disturbance, may serve as a proxy for the potential presence of fragmentary human remains and can be mapped in its horizontal and vertical extents.

Sections 5.1.3 and 5.1.4, below, examine available subsurface data to generate three-dimensional plans of subsurface stratigraphy for historical fill throughout the Project Area. The horizontal extents are interpreted through positive results for historical material in archaeological subsurface tests and monitored geo-environmental and geotechnical tests. The vertical extents are interpreted through stratigraphy recorded in archaeological tests and from borehole logs, cross-referenced with GPR profiles.

5.0 RESOURCE INVENTORY

No human remains, gravesites or material or features related to cemetery use were observed.

Two interim reports were created for investigations conducted under this permit; see Appendix A and Appendix B for the interim reports with detailed results, including subsurface test locations and site maps. The summarized results of testing and monitoring are presented in Table 5.

Table 5. Testing and Monitoring Results Summary

Interim Report No.	Report Title	AIA methods	*Appendix*
1	Heritage Investigations for the New Westminster Secondary School Replacement Project (Conducted in 2016)	Machine testing was conducted with a backhoe and excavator to a maximum excavated depth of 2.4 m below surface. • 32 tests excavated • All material subject to examination by raking including a minimum of 20% of fill, and up to 100% of historical fill (including up to 10% screening) • 61 geophysical anomalies ground-truthed Monitoring of geo-environmental and geotechnical investigations to a maximum depth of 3 m below surface. • 14 mechanical auger boreholes monitored • Potentially cultural levels subject to selective hand-sorting and screening	**A** (Appendices C, D, E)
2	New Westminster Secondary School Subsurface Investigations Monitored in 2017	Monitoring of geo-environmental investigations to a maximum depth of 3 m below surface. • 44 mechanical auger boreholes monitored • 12 hand auger boreholes monitored • 1 test pit monitored • Potentially cultural levels subject to selective hand-sorting and screening	**B**

Test locations and results are summarized in Figure 4, along with additional monitored borehole results from 2007. The results from 2016 and 2017 are summarized in sections 5.1.1 and 5.1.2 below.

Some historical material, including artifacts, either post-dating cemetery use or with no clear association with it, was found in the some tests (see section 5.1.3 below). Some potentially useful data regarding nature and depths of fills was also recorded, and are summarized in section 5.1.4, below.

For the purpose of analysing positive results for historical artifacts and historical fill, the Project Area was further divided into three study units as follows (Figure 4):

- **Unit B-1** – Corresponds with the boundary of DhRr-233 within Investigation Area B, and includes most of land set aside for the "New" Chinese Cemetery Area, subsequently built over by the army barracks, and now covered with the western part of the north playing field and adjacent lane to a distance of approximately 122 m south of Tenth Avenue.
- **Unit B-2** – Includes some of the land set aside for the Potter's field and possibly part of the "Old" Chinese Cemetery Area, subsequently partially built over by the second isolation hospital, the City Works Yard, and the school (Massey Wing, including parts now demolished), and now covered with paved parking as far as a distance of approximately 180 m north of Eighth Avenue.
- **L-Shaped Area** – Outside of the boundary of DhRr-233 and corresponding with Investigation Area C except for the corridor by the Moody Park Arena, with the only known historical use being an outbuilding of the second isolation hospital, and now covered with playing fields, including the skate park.

5.1.1 Interim Report 1

Interim Report 1 provides the detailed results of heritage test excavations and borehole investigations monitored in 2016 under HCA Permit 2016-0377 (Appendix A). In total, 23 boreholes were drilled in 2016 (Figure 4). Fourteen of these boreholes were archaeologically monitored, including all 11 boreholes located within the boundary of archaeological site DhRr-233, and three boreholes located adjacent to the archaeological site.

Thirty-two mechanical tests were excavated in 2016 to facilitate the investigation of 62 subsurface geophysical anomalies, with up to four anomalies investigated per test pit (Figure 4). None of the geophysical anomalies were found to represent burial features. The source of the geophysical burials features were ground-truthed with results summarized in Table 6[8].

[8] Note, that in some anomaly locations, more than one feature was observed, so that the number of observed features listed in this table is greater than the total number of anomalies investigated.

Table 6: Ground-Truthed Results for Geophysical Anomalies.

Feature Observed	Unit B-1	Unit B-2	Other Parts of Investigation Area B	Total
Boulder or large coble	4	10	3	17
Anomaly not observed[9]	3	8	3	14
Drainage/water Infrastructure	9	3	0	12
Metal debris	6	1	4	11
Cobble concentration or other localized deposit of different density	6	0	0	6
Burned tree, or log	1	0	2	3
Worked wood debris	2	0	0	2
Concrete slab	1	0	1	2

No human remains, artifacts associated with cemetery use, or burial features (e.g., grave shafts) were identified in the tests, or monitored investigations.

Based on historical survey data (Burnett and McGugan 1914), the northern playing field area and defined as Study Unit B-1 (also DhRr-401) (Figure 4), corresponded with land that had been set aside for the New Chinese cemetery between 1909 and 1914 (Appendix A, Figures 4 and 5). Testing in this area consisted of 14 heritage tests in which 28 geophsyical anomalies were ground-truthed. Three geo-environmental or geotechnical tests were also monitored in the area. The results of field investigations seem to support the narrative reported in the press after the order to revoke the cemetery lease in 1914 that, “the Chinese Association had spent $1,000 in improving this property, and so far there have been no burials in it…” (*The British Columbian*, 1914).

Historical survey data also suggests (Province of British Columbia, 1892), that the area defined as Study Unit B-2 (Figure 4) overlaps with land that had been set aside for the Potter’s Field and possibly the Old Chinese Cemetery between 1892 and 1909 (Appendix A, Figures 4 and 5). Testing in this area consisted of 13 heritage tests in which 23 geophysical anomalies were ground-truthed. Two geo-environmental or geotechnical tests were also monitored in the area. The results of field investigations provide no insight to the historical extent of the Potter’s Field or Old Chinese Cemetery, however, it appears likely based on the results, that if any of the cemetery gravesites survive, they would be located near Eighth Street or Eighth Avenue, and outside the investigation area and the construction footprints of the school and theatre.

5.1.2 Interim Report 2

Interim Report 2 provides the results for the heritage monitoring component of geo-environmental investigations conducted in 2017 under HCA Permit 2016-0377 (Figure 4). The supplemental geo-environmental investigation consisted of 124 subsurface investigations in total.

[9] Most of the “anomalies not observed” were located below testing depths. Testing was sometimes stopped when basal clays were reached and when there was no evidence in the sediments of a shaft or other previous excavation over the anomaly location. Based on experience where excavation was continued into the clay, the anomaly source was likely a boulder or large cobble embedded within glacial sediments.

Golder archaeologists monitored one test pit, 12 of the hand auger boreholes, and 44 of the truck-mounted solid stem auger boreholes, representing all of the geo-evironmental subsurface investigations located within DhRr-0233 (Investigation Area B), and 17 subsurface investigations located adjacent to the archaeological site (Investigation Area C) (Figure 4).

No human remains, artifacts associated with cemetery use, or burial features (e.g., grave shafts) were identified in the tests, or monitored investigations (see Table 7).

5.1.3 Test and Monitoring Results for Historical Material

The results from heritage tests and monitored subsurface investigations conducted under permit 2016-0377 are summarized in Table 7. While no human remains, gravesites or material or features related to cemetery use were observed in any of the 71 archaeologically monitored geotechnical and geo-environmental subsurface investigations, or 32 archaeological machine tests, cultural deposits were observed in 46 tests (of all types examined by an archaeologist in 2016 and 2017). The anthropogenic historical material ranged from historical artifacts (see Appendix A, Appendix D) to building debris or burnt wood. Table 7 summarizes the (positive) results for this historical material.

Table 7. Summary of Results

Report Title	Number of Monitored Investigations	Number of Archaeological Machine Tests	Number of Positive Tests (Historical Material)	Positive Results for Human Remains, or Material or Features Related to Cemetery Use
School District 40 (New Westminster) Heritage Investigations for the New Westminster Secondary School Replacement Project New Westminster, BC, AIA Interim	14	32	30	0
New Westminister Secondary School Subsurface Investigations Monitored in 2017	57	0	16	0
Totals	**71**	**32**	**46**	**0**

Virtually all of the historical material was recovered from a lower level of fill, referred to in this report as “historical fill”, and described below.

A pattern of fill was commonly reported across the Project Area from test excavations and monitored tests where an uppermost level is present which includes turf or asphalt, with underlying fill. This fill typically consists of clean imported fill of sand or gravel, representing what is often called “engineered fill”. Sometimes this level was not entirely “clean” including some cobbles for instance, and very occasionally contained recent cultural items, like a nail or plastic packaging, but is still identified in this analysis as “imported fill” in contrast to the “historical fill” level beneath it. As this upper level is considered to have been imported to the Project Area after cemetery use, the potential for the level to contain material related to cemetery use including human remains is considered low.

The historical fill level is a mix of silts sands, organic inclusions, and gravels or cobbles. It is characterized by the presence of historical artifacts, some dating to the early 20th century, including glass, ceramic and metal objects, building debris, as well as wood debris (not milled) and charcoal. Although in some places this level included a layer of what has been interpreted as an intact "original surface", typically the greatest part of this level is disturbed (Appendix A). The source of disturbance is assumed to have been from the various land uses ranging from the original land clearing to leveling and land modifications through subsequent historical land uses. As the level was likely disturbed following cemetery use on the property, this layer may be considered to have the potential for containing material associated with cemetery use, possibly including scattered human remains.

The horizontal extent of the historical fill level may be quantified by the recorded presence of historical artifacts in tests, and the vertical extents (depth and thickness) based on recorded in results in borehole logs (including from 2007), archaeological tests, and GPR imaging (see section 5.1.4 below).

Overall, the number of archaeological tests which were positive for the presence of historical material were 23 of 32, or 72%. Of the 114 geotechnical or geo-environmental investigative tests that were archaeologically monitored throughout school property, including in 2007, 39 of the monitored tests were positive for the presence of historical material, or 34%. Tests which were positive for the presence of historical materials, including results from 2007, are summarized according to the study units listed above in Table 8 (Figure 4).

Table 8: Tests Positive for Historical Materials by Study Unit.

Number and Type of Tests per Study Unit	Positive Tests (#)	Positive Tests (%)
Unit B-1		
14 Archaeological Tests	14	100%
13 Monitored Geo-Environmental/Geotechnical Tests	10	77%
Unit B-2		
13 Archaeological Tests	6	46%
21 Monitored Geo-Environmental/Geotechnical Tests	3	14%
L-Shaped Unit		
30 Monitored Geo-Environmental/Geotechnical Tests	6	20%

The results illustrated in Table 8 show that historical material was observed in by far the greatest number and proportion of tests in Study Unit B-1. In sharp contrast to archaeological tests that were 100% positive in Study Unit B-1, less than half in Study Unit B-2 were positive. Monitored tests that were positive in Study Unit B-2 and the L-Shaped Unit were similarly low in proportion. It is notable that none of the positive tests in the L-Shaped Unit were farther than 17 m from Investigation Area B and the site boundary of DhRr-0233.

Studies of the artifacts collected in Study Unit B-1 (including Stage 3 and Stage 4a in Appendix A) indicate that many are consistent with items which would have been utilized at the Westminster Regiment Training Barracks from 1939 to 1945, while the artifacts found closest to the Pearson Wing, along with industrial and construction material found there, are consistent with debris from the mid-century construction of the school. The historic material observed in Study Unit B-2 (Stage 4a in Appendix A) was also primarily construction debris. Artifacts were few in Study Unit B-2, and not diagnostically suggestive of a particular period or activity (Appendix A, Appendix D).

5.1.4 Depths of Imported and Historical Fills

The basal depths and thickness of imported fill (also top of historical fill) and historical fill, respectively, are illustrated in Figures 5 to 8. The data points provide depths below surface for a generalized site stratigraphy recorded from the following sources:

- Borehole logs for 2007, 2016 and 2017
  - 175 data points (including hand augers), Figures 5 and 6
  - 169 data points, Figures 7 and 8
- Archaeological tests (average test depths appearing as data point clusters of five, for the centre and four corners of each test)
  - 32 tests and 160 data points, Figures 5 and 6
  - 31 tests and 155 data points, Figures 7 and 8
- Select GPR profiles with points collected from profile imagery (Golder 2017b), appearing as lines in Figures 5 and 7
  - 5,963 data points from 10 profiles, Figures 5 and 6
  - 3,878 data points from 10 profiles, Figures 7 and 8

Figure 5 shows the contoured depths to the top of historical fill; while Figure 6 shows the thickness of imported fill, or essentially the same information. The thickness of imported fill is up to 70 cm and more in some areas, for instance at the location of the former boiler house beneath the portables, near the baseball diamond, and a pocket just west of the middle of Mercer Field. Study Unit B-1 has an imported fill layer that is fairly deep (around 50 cm) and even, although it is shallower under the paved lane closer to the school (20 cm to 30 cm). The paved area of Study Unit B-2 is similarly shallow (20 cm to 30 cm) although it deepens slightly towards the southwest corner.

The depths to the bottom of historical fill (Figure 7) vary more greatly. Depths near the former boiler house reached up to 4 meters in depth, and pockets are over 2 and 3 meters deep in other areas. Most of the pockets may be related to historical infrastructure such as adjacent to the Pearson Wing or north of the Massey Theatre. The pockets of deeper fill under the grass fields likely reflect natural depressions such as the streambed in Study Unit B-1 observed in geophysical report (Golder 2017b).

The thickness of historical fill (Figure 8) reflects the thickness of (mostly) disturbed material that contains historical material, at least based on tests within the DhRr-233. Note, that the thicker historical fill in the eastern part of the L-Shaped Unit contains some burnt material, probably from land-clearing, but not artifacts or building materials, and is therefore of a different character than the historical fill within and adjacent to DhRr-233. This historical fill is very thin or non-existent in the middle part of the property, from the playing field into Study Unit B-2. Generally the historical fill is quite thick in the northern playing field areas, over 1 metre thick typically. Again, the thickest historical fill is found filling the areas formerly excavated for infrastructure. Note that some known excavations for infrastructure are not evident in Figure 7 and 8 because no tests (data points) were undertaken in areas known to have structure (e.g., the school tunnels) based on the geophysical survey (Golder 2017b).

The depth and thickness of historical fill assists in estimating the vertical limits across the Project Area for deposits that may potentially contain scattered artifacts associated with cemetery use or human remains. The imported fill above this level is not considered to be historically sensitive. The “sterile” clay level observed below historical fill could potentially contain a grave shaft excavated into it, but if construction-related excavations are monitored through the historical fill above this level, based on experience with the archaeological tests conducted in 2016, it is anticipated that the disturbed material in the shaft should contrast with the basal clays and be apparent to the monitors as excavation depths reach into the clays.

6.0 RESOURCE EVALUATION

Site significance was assessed using Appendix D and E of the Guidelines (Archaeology Branch 1998), which considers scientific, public, economic, cultural and historical significance in evaluating overall site significance. Scientific significance refers to whether an archaeological site contains evidence that may enhance our understanding of culture history, culture process, and other aspects of local and regional prehistory. While no archaeological material associated with cemetery use was revealed as part of this study, the following resource evaluation assumes it is a cemetery site.

Scientific significance of archaeological sites can range from high to low based on their size, complexity, antiquity, suitability of dating, and condition of the site. Public significance of an archaeological site refers to the suitability of the site to serve in an interpretive, educational or recreational capacity. Economic significance attempts to assess the monetary benefits of the public’s use of an archaeological site. Cultural significance, also referred to “ethnic significance” (Archaeology Branch 1998), pertains to the traditional, social, or religious importance of an archaeological site to a particular group or community. Historic significance assesses whether a site is associated with British Columbia’s early development, with a particular historic person, group, or event; or with a recurring event of historical significance. Table 9 presents the summary of significance ratings for site DhRr-233.

Table 9: Resource Significance of Site DhRr-0233.

Aspect	Significance Rating	Rationale
Scientific Significance	Low	No scientific significance is apparent.
Public Significance	High	Public interest has already been expressed in the history of the site, and it is well-placed in an urban community setting for interpretation and commemoration.
Economic Significance	Low	No economic significance is apparent.
Cultural Significance	High	A variety of community groups is represented in the historical record at the cemetery, and there is also interest being currently expressed by corresponding stakeholders and First Nations.
Historical Significance	Moderate	The site is of moderate historical significance to the City of New Westminster.

7.0 IMPACT IDENTIFICATION AND ASSESSMENT

No human remains or historic materials and features associated with cemetery use were identified during the archaeological impact assessment of the Project Area. As such, no impacts to HCA-protected archaeological site DhRr-233 are anticipated as a result of the proposed school replacement activities within the Project Area.

8.0 IMPACT MANAGEMENT RECOMMENDATIONS

Given that the heritage investigation program did not identify any areas used for burials, or human remains or historic materials and features associated with cemetery use, no further archaeological investigations are recommended prior to development of the replacement school (in Investigation Area B), provided that development impacts do not extend into areas of DhRr-233 and DhRr-401 where subsurface tests have not been conducted (e.g., Investigation Area A).

Should proposed development extend into Investigation Area A (or parts of the arena corridor that are within the site boundary of DhRr-233), Golder recommends that an AIA be conducted with test locations based on geophysical imagery to investigate the possible presence of gravesites, material associated with cemetery use and scattered human remains prior to subsurface construction activities taking place.

Records indicate there have been extensive impacts to the cemetery areas known to have formerly existed within or adjacent to the Project Area. The extent of some of these impacts is also evident in the archaeological record. As a result, despite the negative results of investigations, Golder recommends implementing the following heritage management recommendations over the duration of the school replacement project, to be detailed in a future Archaeological Management Plan.

Chance Find Management

To address the potential of finding intact or fragmentary human remains or burial-related historical material during construction, Golder recommends the development and implementation of a Chance Find Management Procedure for use by SD40. The objectives of this Procedure include the preservation and proper management of heritage resources that are unexpectedly encountered during school replacement activities. This will also minimize disruption to construction activities and scheduling. The document will include both general guidelines and detailed steps to follow for the appropriate response to the discovery of known or suspected archaeological materials, including human remains or grave goods, during the course of school replacement activities. In addition to providing instructions for construction crews, it will include a list of important contacts and telephone numbers for reference.

Heritage Conservation Act Permitting

Following advice from the Archaeology Branch and to address the possible need for additional archaeological testing, as well as the potential for encountering fragmentary human remains and to allow for archaeological monitoring, valid HCA permits (S.12 and S.14) will be in place during construction. Having the permits in place would likely allow for the timely implementation of appropriate resource management procedures in the event that such remains are encountered anywhere in the Project Area.

Archaeological Monitoring

As an added precaution, archaeological monitoring by a qualified archaeologist is recommended under terms of the HCA permit during construction-related activities that may result in subsurface disturbance of the historical fill, primarily within Investigation Areas A and B with a buffer extending 20 m from DhRr-233 into Investigation Area C. Based on the negative results of the AIA, monitoring would not be required at all times during these activities, but may be implemented on occasion according to development plans (particularly proposed depths for excavations), following comparison to recorded depths of imported and historical fill, per guidance developed in the Archaeological Management Plan, and through on-going discussions with the Archaeology Branch and SD40 when and where potentially more sensitive areas are being impacted.

Revisit Archaeological Site Boundary

At the conclusion of the Project, when all the archaeological results are available, (including from monitoring and possible chance finds during construction), the boundary of site DhRr-233 should be reviewed taking into account the areas where any cemetery-related material may have been found archaeologically and those untested areas with potential for the presence of burials.

9.0 EVALUATION OF RESEARCH

The methods employed during this investigation were designed based on the results of the background research, geophysical reconnaissance and on field observations within and adjacent to DhRr-0233.

Subsurface inspection of the Project Area are considered appropriate field investigation methods for identifying and evaluating heritage materials, features, and deposits, if present. Existing urban development in and around the Project Area was noted and no archaeological materials were identified during surface inspection.

Subsurface tests were placed to investigate geophysical anomalies representing a variety of signatures and grouping, while also being spaced at between 15 m and 40 m apart within areas considered to have archaeological potential within the Project Area. The nature and extent of any buried archaeological deposits, if present, were identified. Sediments observed are similar to those exposed in the monitored locations (Photographs 6 to 8 in Appendix B).

These AIA results are considered sufficient to inform future management of archaeological resources relative to project impacts.

10.0 STUDY LIMITATIONS

Even the most thorough inspection may fail to reveal the presence of archaeological and heritage materials, including those protected by the *Heritage Conservation Act*. Therefore, consistent with the intent of the HCA, SD40 is advised that if any unanticipated cultural materials or features including, but not limited to archaeological and historic objects, human remains and/or cemetery or burial features, are encountered, prior to, or during school replacement activities, all land altering work in the immediate vicinity should cease. The Archaeology Branch, interested stakeholder communities, and a qualified archaeologist should be contacted as soon as possible.

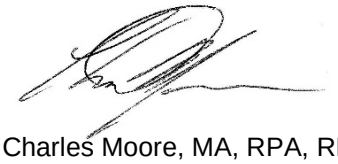
11.0 CLOSURE

This permit report was prepared solely for School District No. 40 (New Westminster) and the Archaeology Branch, in partial fulfillment of the terms and conditions of HCA Permit 2016-0377. Any use, reliance, or decisions made by third parties on the basis of this report are the responsibility of such third parties.

We trust the information in this report is sufficient for your present needs. Should you have any questions regarding the heritage services for this Project, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

Ryan Sagarbarria, BA, RPCA
Archaeologist



Charles Moore, MA, RPA, RPCA
Senior Archaeologist

Andrew Mason, MA, RPCA
Principal, Cultural Resource Specialist

RS/CDM/ARM/nnv

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12.0 REFERENCES

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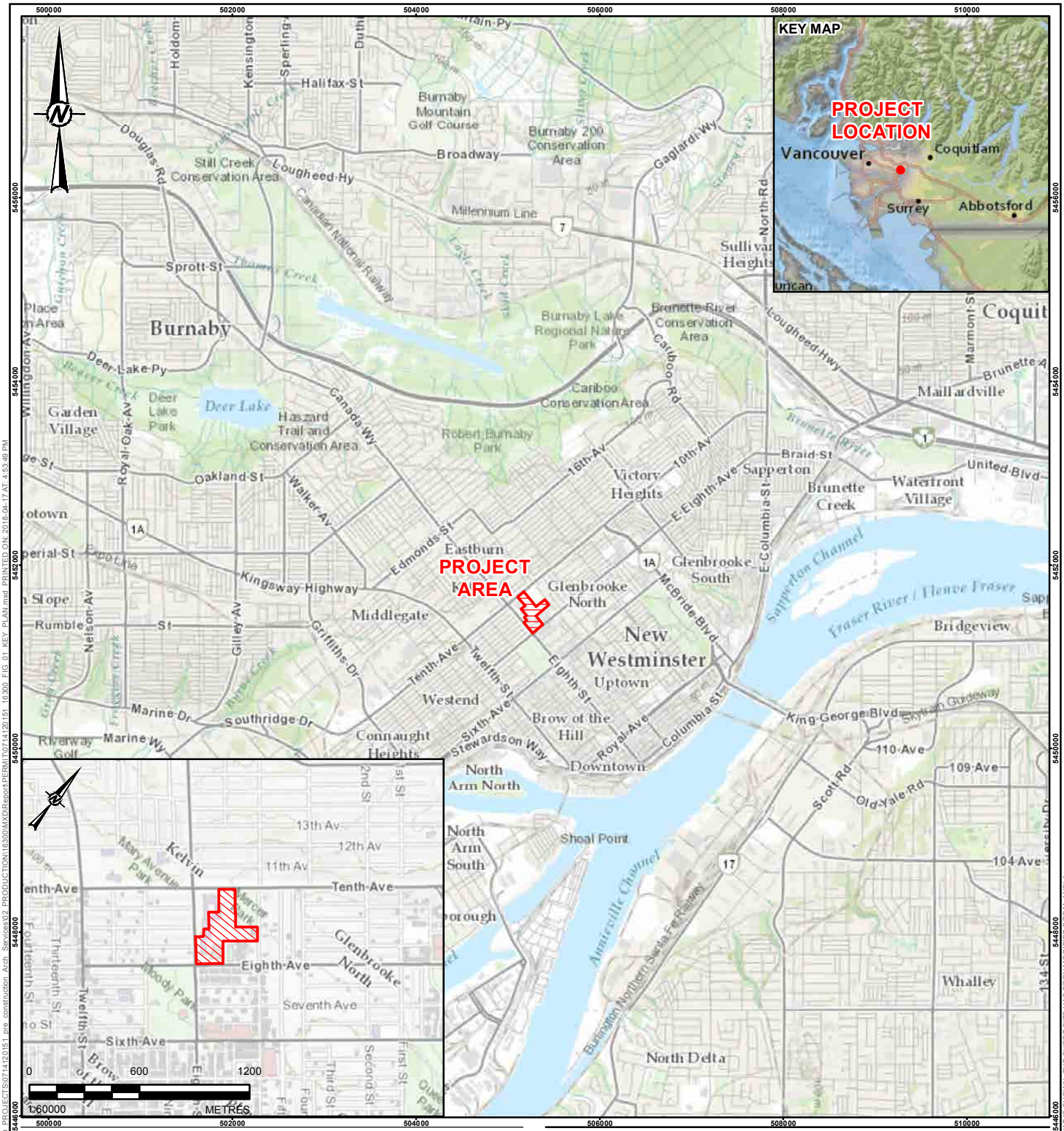

LEGEND

- PROJECT AREA
- MAJOR ROAD
- LOCAL ROAD

REFERENCE(S)

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DATUM: NAD 83 PROJECTION: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
KEY PLAN

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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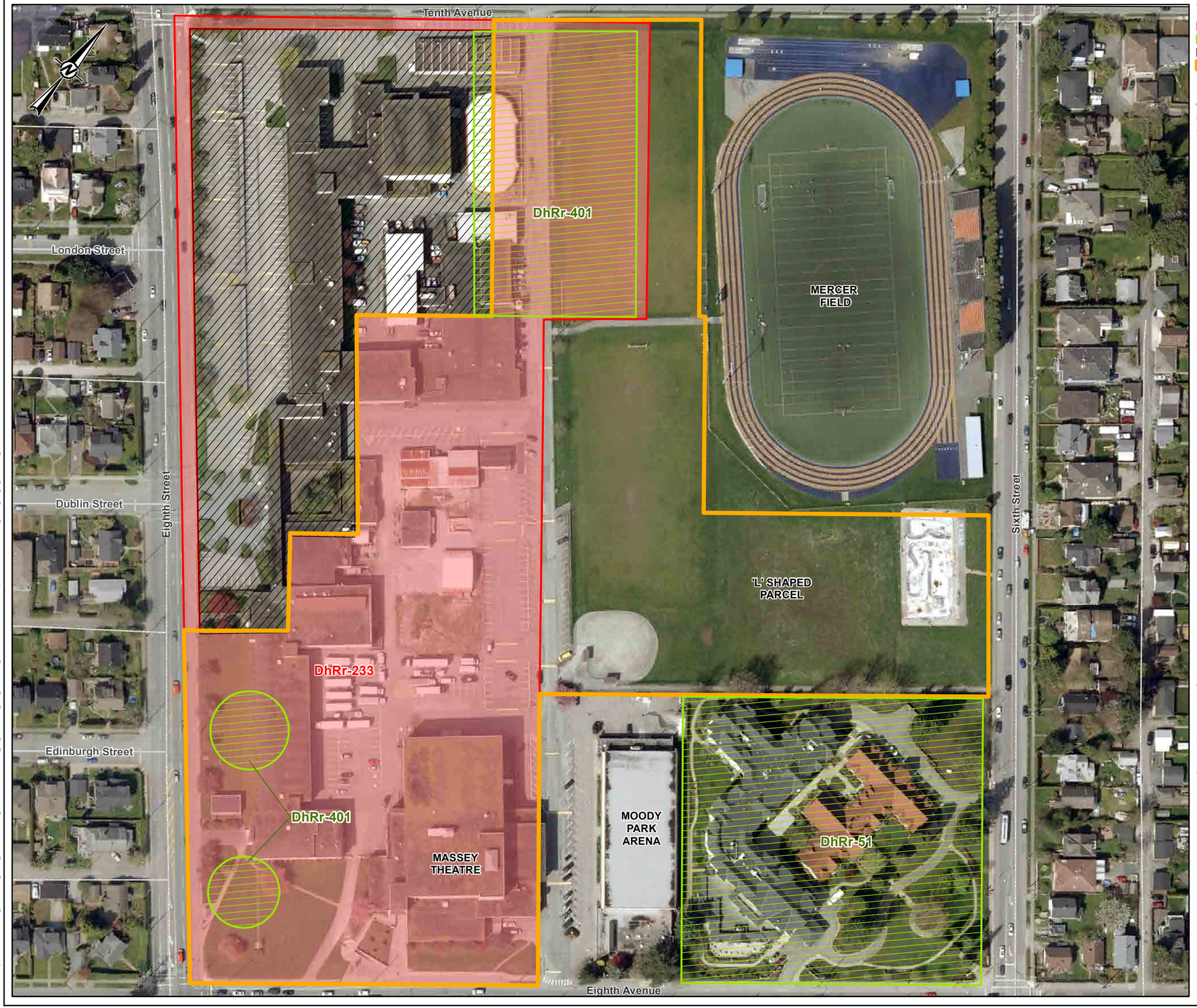

LEGEND

- ARCHAEOLOGICAL SITE
- HISTORICAL PLACE
- DESIGNATED PLACE OF INTERMENT (CIFSA)
- PROJECT AREA

BASE DATA

- LOCAL ROAD
- LOCAL STREET
- PRIMARY HIGHWAY
- PARCEL

0 40 80

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REFERENCES

1. ARCHAEOLOGICAL SITE DHRR-233 AND HISTORIC PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
2. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
PROJECT AREA

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	MR
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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- INVESTIGATION AREA FOR SUBSURFACE INVESTIGATIONS

AREA A - SUBJECT TO GEOPHYSICAL INVESTIGATION ONLY

AREA B - SUBJECT TO GEOPHYSICAL INVESTIGATION, ARCHAEOLOGICAL SUBSURFACE TESTS AND ARCHAEOLOGICAL MONITORING OF ALL BOREHOLE TESTS

AREA C - SUBJECT TO ARCHAEOLOGICAL MONITORING OF SOME BOREHOLE TESTS

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
PLAN OF INVESTIGATION AREAS 2016-2017

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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LEGEND

ARCHAEOLOGICAL TEST PIT LOCATION

- POSITIVE RESULT (HISTORICAL MATERIAL)
- NEGATIVE RESULT

2016/2017 INVESTIGATIONS

- MONITORED TEST - POSITIVE RESULT (HISTORICAL MATERIAL)
- MONITORED TEST - NEGATIVE RESULT
- UNMONITORED TEST

PREVIOUS INVESTIGATIONS

- MONITORED TEST - POSITIVE RESULT (HISTORICAL MATERIAL)
- MONITORED TEST - NEGATIVE RESULT
- UNMONITORED TEST
- ROAD
- INVESTIGATION AREA FOR SUBSURFACE INVESTIGATIONS
- STUDY UNIT BOUNDARY

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
SUMMARY OF SUBSURFACE INVESTIGATIONS

CONSULTANT

Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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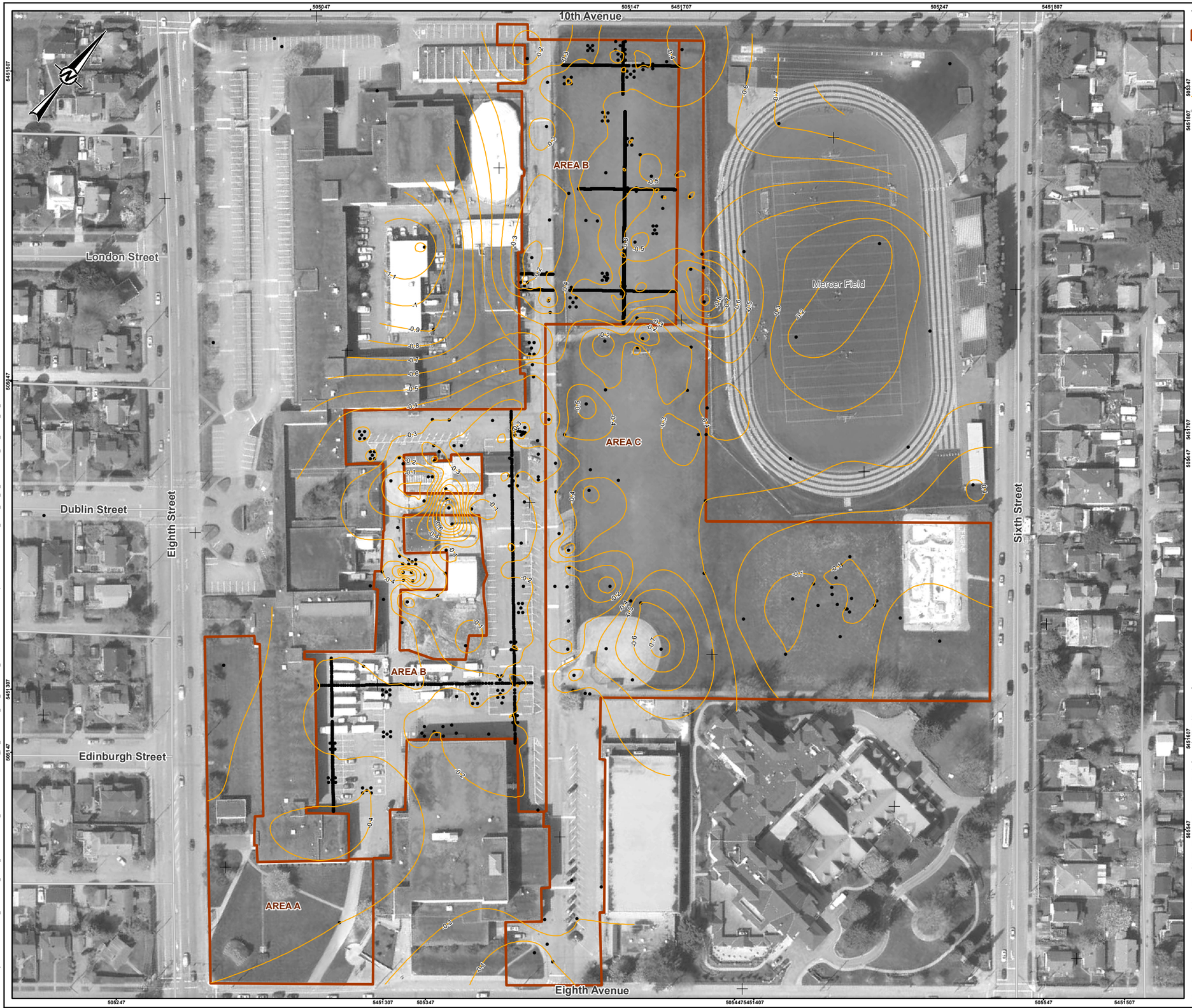

LEGEND

- INVESTIGATION AREA FOR SUBSURFACE INVESTIGATIONS
- DATA POINT
  - LINEAR POINTS FROM GPR
  - 5-POINT CLUSTERS FROM ARCHAEOLOGICAL TESTS
  - SINGLE POINTS FROM BOREHOLE LOGS
- DEPTH TO HISTORICAL FILL CONTOUR - 0.1m
- ROAD

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
DEPTH TO TOP OF HISTORICAL FILL

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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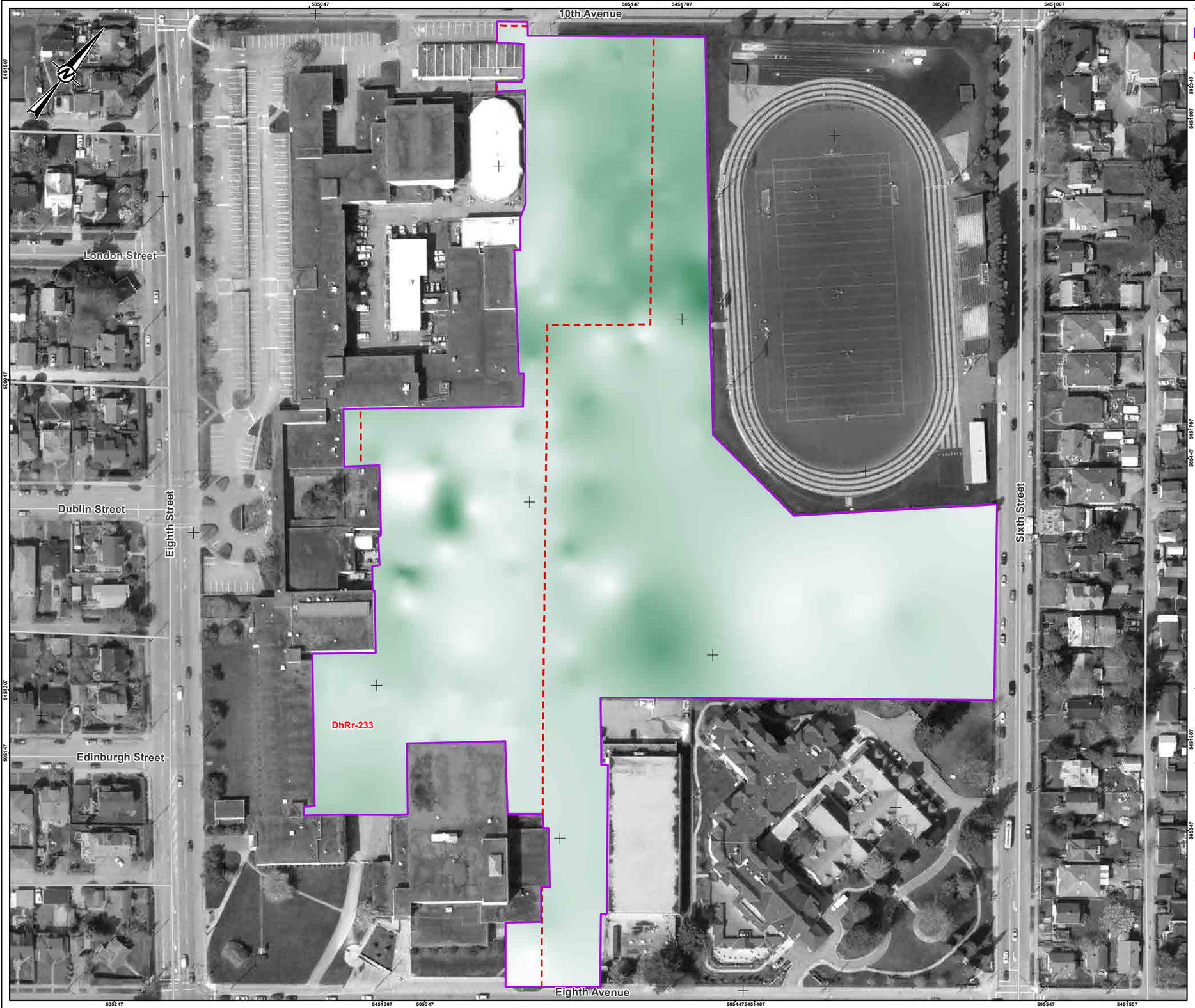

LEGEND

- HISTORICAL FILL MODELLED EXTENT
- ARCHAEOLOGICAL SITE BOUNDARY OF DhRr-233 WITHIN MODELLED EXTENT
- ROAD

THICKNESS OF IMPORTED FILL (m)

-0.10
-0.20
-0.30
-0.40
-0.50
-0.60
-0.70
-0.80
-0.90
-1.00
-1.10
-1.20

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
THICKNESS OF IMPORTED FILL

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	16300/16304	0	6

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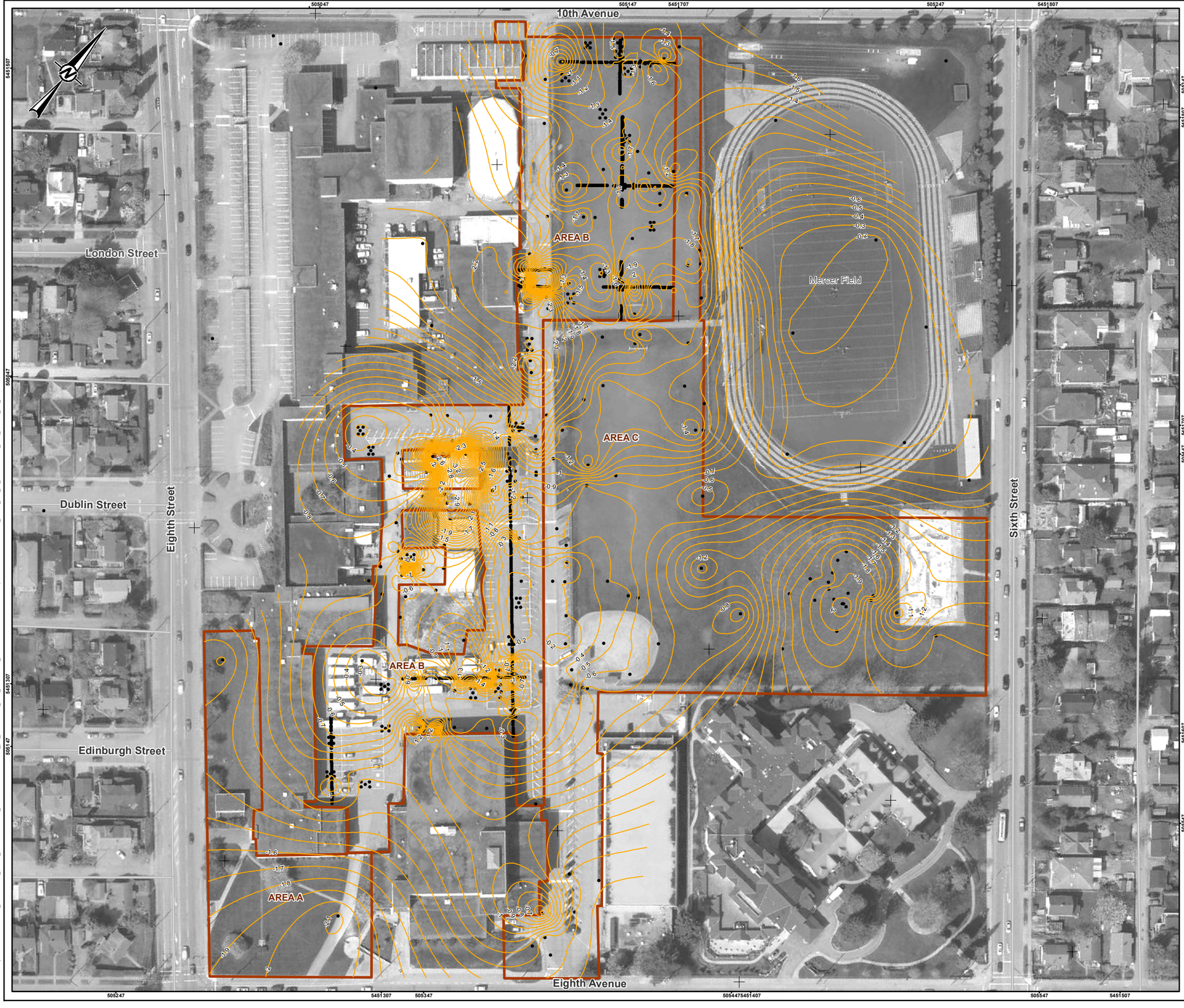

LEGEND

- INVESTIGATION AREA FOR SUBSURFACE INVESTIGATIONS
- DATA POINT
  - LINEAR POINTS FROM GPR
  - 5-POINT CLUSTERS FROM ARCHAEOLOGICAL TESTS
  - SINGLE POINTS FROM BOREHOLE LOGS
- DEPTH TO HISTORICAL FILL CONTOUR - 0.1m
- ROAD

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
DEPTH TO BOTTOM OF HISTORICAL FILL

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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25mm

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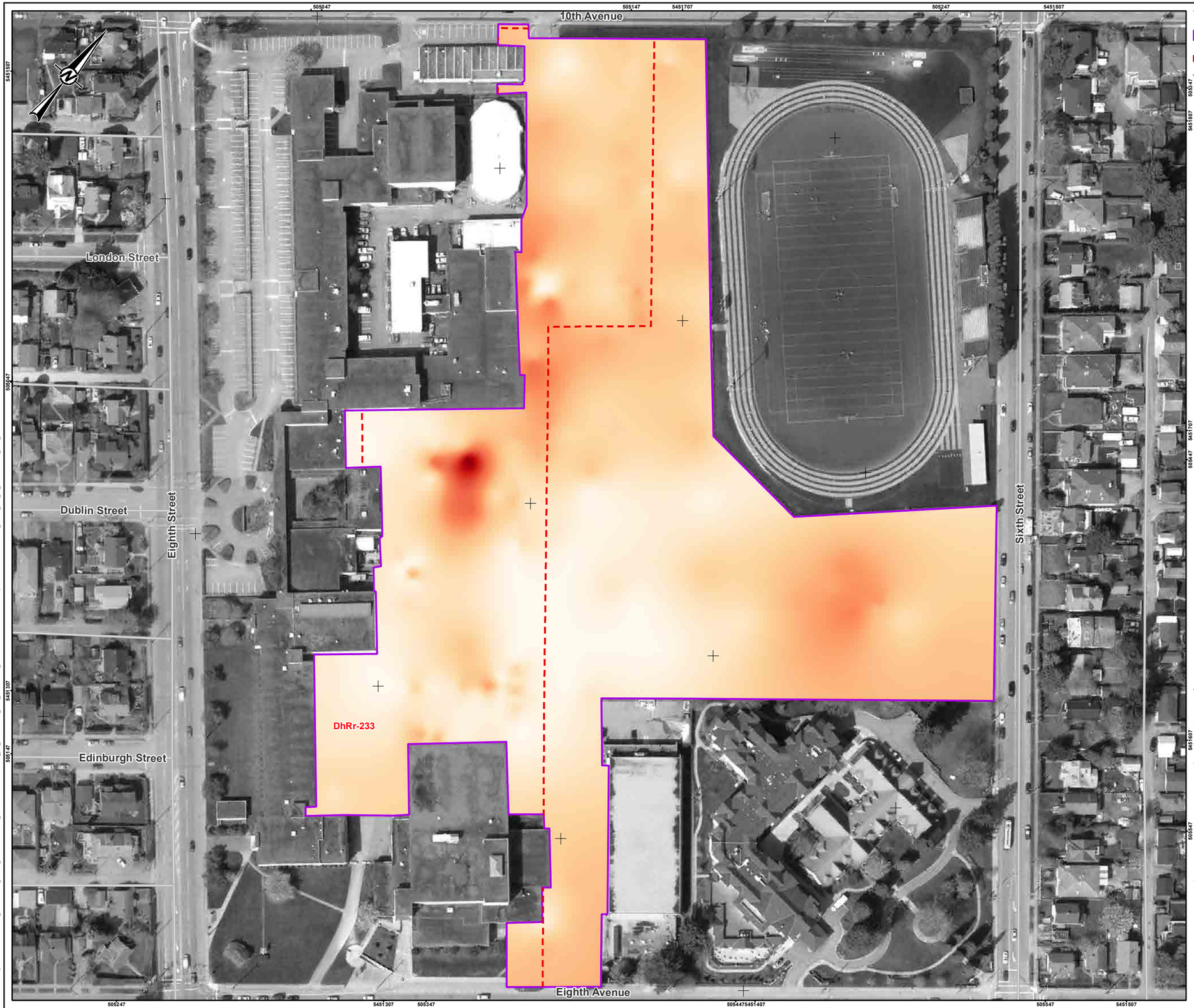

LEGEND

- HISTORICAL FILL MODELLED EXTENT
- ARCHAEOLOGICAL SITE BOUNDARY OF DhRr-233 WITHIN MODELLED EXTENT
- ROAD

THICKNESS OF HISTORICAL FILL (m)

4.0
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3.0
2.9
2.8
2.7
2.6
2.5
2.4
2.3
2.2
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DhRr-233 AND HISTORICAL PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2017/03/31).
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CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.
PERMIT REPORT HCA 2016-377

TITLE
THICKNESS OF HISTORICAL FILL

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	CDM
PREPARED	JP
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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APPENDIX A

Archaeological Impact Assessment Interim Report (HCA 2016-377) for 2016. 12 June 2017

12 June 2017

ARCHAEOLOGICAL IMPACT ASSESSMENT INTERIM REPORT

School District 40 (New Westminster) Heritage Investigations for the New Westminster Secondary School Replacement Project New Westminster, BC

Heritage Conservation Act Permit 2016-0377
Seyem' Quantlen First Nation Heritage Inspection Permit SQ 2017-43
Squamish Nation Archaeological Investigation Permit 16-0170
Stó:lō Heritage Investigation Permit 2016-143
Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094

Submitted to:

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REPORT

Report Number: 0714120151-578-R-Rev0-15400

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Métis Nation British Columbia
Musqueam Indian Band
National Congress of Chinese Canadians
National Nikkei Museum and Heritage Centre (Burnaby)
New Westminster Indian Band
Penelakut Tribe
Queens Avenue United Church, New Westminster
St. Peter's Roman Catholic Church, New Westminster c/o Gardens of Gethsemani
Semiahmoo First Nation
Stó:lō Nation People of the River Referrals Office
Stz'uminus First Nation
Squamish Nation
Tsawwassen First Nation
Tsleil-Waututh Nation
Tsilhqot'in National Government
Union Solomon Masonic Lodge
Vancouver School of Theology

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Executive Summary

At the request of School District No. 40 (New Westminster), Golder Associates Ltd. provided heritage services, which included an archaeological impact assessment of archaeological site DhRr-233, in support of the development of a new secondary school (the New Westminster Secondary School Replacement Project) on School District No. 40 property located at 735 Eighth Avenue (Lot 3, District Lot 2055, and DL5678, Plan EPP17131, Group 1, New Westminster District, NwID 1185900), New Westminster, BC (Figure 1). The Project Area does not include the School District No. 40 property located at 835 Eighth Street, which is a dedicated cemetery under the *Cremation Interment and Funeral Services Act*. Heritage work included: (1) geotechnical and geo-environmental borehole monitoring within and immediately adjacent to the area of archaeological site DhRr-233; and (2) mechanical testing of identified geophysical anomalies to determine the presence/absence of human remains and/or buried evidence of historical cemetery use within the Project Area. This report summarizes the results of the archaeological impact assessment conducted under *Heritage Conservation Act* Permit 2016-0377 between November 14 and December 13, 2016 and provides heritage recommendations for the duration of the Project.

Given the cemetery history and the large number of cultural groups and organizations associated with it, the *Heritage Conservation Act* permit application was distributed widely for review and comment. This list included First Nations groups identified in the Province's Consultative Areas Database Internal Map Application, cultural groups known or suspected to have used parts of the New Westminster Secondary School property for burial purposes, and First Nations, community groups, or fraternal organizations with members that records indicate were interred on the land whether the interments were located within the Project Area or the dedicated cemetery area (DhRr-401). The Tsilhqot'in National Government was included given their interest in the identification and recovery of the remains of Chief Ahan who was executed in New Westminster in 1865.

Golder applied for and received Seyem' Qwantlen Heritage Investigation Permit SQ 2017-43, Squamish Nation Archaeological Investigation Permit 16-0170, Stó:lō Heritage Investigation Permit 2016-143, and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094. Golder also applied for a Musqueam Indian Band Agreement to Conduct Archaeological Research within Musqueam Traditional Lands, but have not received a permit at the time of writing. Representatives of the Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, and Tsleil-Waututh Nation participated in field work between November 14 and December 13, 2016.

Results

Twenty-three boreholes were drilled between November 14 and 28, 2016. Fourteen of these boreholes were archaeologically monitored, including all 11 boreholes located within the boundary of archaeological site DhRr-233, and three boreholes located adjacent to the archaeological site. No human remains or evidence of historic materials associated with cemetery use were identified in these boreholes.

Thirty-two mechanical tests were excavated to facilitate the investigation of 62 subsurface geophysical anomalies, with up to four anomalies investigated per test pit, between November 23 and December 13, 2016. No human remains, artifacts associated with cemetery use or burial features (e.g., grave shafts) were identified in the tests. Subsurface geophysical anomalies, when identified in the tests, consisted of a range of natural and historic objects. These included boulders, tree stumps and branches, metal objects, construction debris and a previously paved surface.

Impact Management Recommendations

Given that the heritage investigation program did not identify any human remains or historic materials and features associated with cemetery use, no further archaeological investigations are recommended prior to development of the replacement school, provided that development impacts do not extend into areas of DhRr-233 that have not been assessed.

Records indicate there have been extensive impacts to the cemetery areas known to have formerly existed within or adjacent to the Project Area. The extent of some of these impacts is also evident in the archaeological record. As a result, despite the negative results of investigations, Golder recommends implementing the following heritage management recommendations over the duration of the school replacement project.

Chance Find Management

To address the potential of finding intact or fragmentary human remains or burial-related historical material during construction, Golder recommends the development and implementation of a Chance Find Management Procedure for use by SD40. The objectives of this Procedure include the preservation and proper management of heritage resources that are unexpectedly encountered during school replacement activities. This will also minimize disruption to construction activities and scheduling. The document will include both general guidelines and detailed steps to follow for the appropriate response to the discovery of known or suspected archaeological materials, including human remains or grave goods, during the course of school replacement activities. In addition to providing instructions for construction crews, it will include a list of important contacts and telephone numbers for reference.

Heritage Conservation Act Permitting

To address the potential for encountering fragmentary human remains and to allow for archaeological monitoring, a valid *Heritage Conservation Act* permit (either Section12 or Section 14) should be in place during construction. Following advice from the Archaeology Branch, an amendment to the current *Heritage Conservation Act* permit would likely allow for the timely implementation of appropriate resource management procedures in the event that such remains are encountered anywhere in the Project Area.

Archaeological Monitoring

As an added precaution, archaeological monitoring by a qualified archaeologist is recommended under terms of the *Heritage Conservation Act* permit during construction-related activities that result in subsurface disturbance. Based on the negative results of the archaeological impact assessment, monitoring would not be required at all times and all areas during these activities, but may be implemented on occasion according to development plans, and through on-going discussions with the Archaeology Branch and SD40 when and where potentially more sensitive areas are being impacted. These potentially more sensitive areas may be determined and mapped as part of the discussion process.

Revisit Archaeological Site Boundary

At the conclusion of the school replacement project, when all the archaeological results are available, (including from monitoring and possible chance finds during excavations for construction), the boundary of site DhRr-233 should be reviewed taking into account the areas where any cemetery-related material may have been found archaeologically and those untested areas with potential for the presence of burials.

Credits

Project Director	Andrew Mason, MA, RPCA
Project Manager and Permit Holder	Charles Moore, MA, RPCA
Archaeologists	Lindsay Foreman, PhD
	Melody Reich, BSc (Hons.)
	Ryan Sagarbarria, BA, RPCA
	Grant Takasaki, BA
	Meng Ying, MA, RPCA
Field Assistants	Joey Antone (Seyem' Qwantlen First Nation)
	George Chaffee (Kwikwetlem First Nation)
	Mike Cook (Semiahmoo First Nation)
	Darryl Guss (Tsleil-Waututh Nation)
Artifact Analysis	Lindsay Foreman
	Melody Reich
	Grant Takasaki
Report Authors	Lindsay Foreman
	Charles Moore
	Melody Reich
	Grant Takasaki
Senior Technical Review	Andrew Mason

Field crew participation is summarized in Table 1.

Table 1: Field Crew Roles

Crew Member	Role	Affiliation	Dates of Participation
Charles Moore	Field Director	Golder Associates	November 23-25, 28-29; December 5, 7-8,12-13, 2016
Andrew Mason	Field Director	Golder Associates	November 30; December 1-2, 2016
Meng Ying	Field Supervisor	Golder Associates	December 5, 7-8, 12, 2016
Ryan Sagarbarria	Field Supervisor	Golder Associates	November 17-18, 21-25, 28-30; December 1-2, 13, 2016
Lindsay Foreman[1]	Field Supervisor	Golder Associates	November 23-25, 28-30; December 1-2, 5, 7-8, 12-13, 2016
Melody Reich[2]	Field Supervisor	Golder Associates	November 23-25, 28-30; December 1-2, 5, 7, 2016
Grant Takasaki[3]	Field Supervisor	Golder Associates	November 23-25, 28; December 8, 12-13, 2016
Joey Antone	Field Assistant	Seyem' Qwantlen	November 17-18, 21, 23-25, 28-30; December 1-2, 7, 13, 2016
George Chaffee	Field Assistant	Kwikwetlem First Nation	November 17-18, 23-25, 29; December 13, 2016
Mike Cook	Field Assistant	Semiahmoo First Nation	November 28-30; December 1-2, 5, 7-8, 13, 2016
Darryl Guss	Field Assistant	Tsleil-Waututh Nation	November 23-24, 28-30; December 1, 7-8, 12-13, 2016

[1] Field Director In-Training: November 23-25, 28-30; December 1-2, 5, 7-8, 12-13, 2016.

[2] Field Director In-Training: November 23-25, 28-30; December 1-2, 5, 7, 2016.

[3] Field Director In-Training: December 12-13, 2016.

GLOSSARY OF TECHNICAL TERMS

Many terms and abbreviations used throughout this report have historical, anthropological or archaeological significance and may be unfamiliar to non-specialists. These terms are defined below. In addition, this list also defines frequently used abbreviations.

Term / Abbreviation	Definition
AIA	See Archaeological Impact Assessment.
Anthropogenic	Anything derived from human agency, as opposed to anything occurring in natural environments without human influence.
Anomaly	A signature identified in the geophysical data (see EM and GPR) that exhibits contrasting characteristics in a localized subsurface area with the surrounding soil. For the purposes of this study anomalies have been further characterized as follows: • Strong: an anomaly with high contrast to ambient material, possibly including metallic characteristics. • Subtle: an anomaly with low to moderate contrast with ambient soil. • Primary: a judgemental assessment of an anomaly that should be prioritized for testing based on specific characteristics, location and results in previous tests for sampling purposes. • Alternate: a judgemental assessment of an anomaly as an alternate or second tier of prioritization for sampling purposes, that may become a priority for testing depending on on-going results.
Archaeological Impact Assessment	A study to assess for potential conflicts between known archaeological sites or areas with the potential to contain archaeological resources and a proposed development. Sites are located and recorded, site significance is evaluated, and the nature and extent of expected impacts are assessed. Recommendations to mitigate potential project effects on sites are provided.
Archaeological Site	A location that contains physical evidence of past human activity and that can be studied by archaeological methods of investigation, including site survey, excavation, and data analysis.
Archaeology	The study of human societies using the material remains of their behaviour. Some objectives of archaeology are to construct culture history, reconstruct past lifeways, and study cultural processes.
Articular Bone	Bone surface that makes normal contact with another bone, via a joint.
Artifact	A portable object made, modified, used, or transported by humans; includes finished objects, waste products, and unmodified raw materials.
Artiodactyla	Hoofed mammals that have an even number of functional toes on each foot.
Basal	Referring to the bottom, specifically the bottom of a test pit, and the basal sediments typically comprised of undisturbed natural silts.
Before Present	See BP.
Below Surface	Beneath the ground surface.
Borden Number	A unique archaeological site number composed of four letters and one number (e.g., DhRt-5) based on the longitude and latitude of the location.
Bovids	Even-toed hoofed mammals with horns that never shed.
BP	A dating convention usually associated with radiocarbon dating. BP refers to years Before Present, with present accepted as AD 1950 by convention.
Calcined	Denotes bone that has been burnt to the extent that is reduced to its white/blue mineral constituents.
Cancellous Bone	A spongy layer of bone that forms the inner surface.

Term / Abbreviation	Definition
CIFSA	*Cremation Interment and Funeral Services Act*
Cortical Bone	Dense protective layer of bone that forms the outer surface around internal cavities.
Cultural Deposit	Accumulated sediments directly produced or modified as the result of human activity. Typically comprised of stratified layers of anthropogenic soils, charcoal, ash, fire-altered rocks, faunal remains, and artifacts.
Cultural Remains	Includes archaeological deposits (surface and subsurface) as well as features, structures and objects.
DBS	Depth below surface (of the ground).
EM (Conductivity Mapping)	Electromagnetic Conductivity Mapping; a geophysical method that consists of generating and measuring electromagnetic fields which are affected by ground constituents, including: soil/rock type, porosity, soil moisture content and mobile ion concentrations, and buried metal. For this Project, EM was used to produce map-view images for locating buried features of interest and areas of different ground types/conditions. This method is discussed in more detail in the report.
Embossing/Embossed	A raised relief design.
Epiphyseal plate	An area near the ends of long bones responsible for growth
Exhumation	The digging up or removal of something generally buried and is used to describe removing human remains from a grave or vault for the purpose of examination or reburial at a different location.
Faunal Remains	The remains, typically bone, of animals discovered in an archaeological context.
FCR	See Fire-Cracked Rock.
Feature	Non-portable archaeological remains such as hearths or post holes.
Fire-Cracked Rock	Heat fractured stone that results from rapid or alternate heating and cooling as in stone boiling or by campfire.
Geotechnical	A branch of civil engineering concerned with the engineering behaviour of earth materials.
Geo-environmental	The application of engineering principles to subsurface contamination, to protect the environment and human health
Geophysics	Study of physics of Earth (e.g., gravity, geomagnetism, tectonophysics, and seismology) and using physics to image Earth's interior based on contrasts in physical properties of earth materials and buried objects.
Glaze/Glazed	An applied liquid coating that is fused to the surface of ceramics during firing.
GIS	Geographic Information System; a computer program used to map land and organize thematic information.
GPR	Ground penetrating radar; a geophysical method that emits electromagnetic pulses into the ground and measures resulting radar reflections from soil layering and buried objects. The resulting profile is a high resolution cross-sectional image of subsurface layering and a wide variety of natural or artificial buried features. This method is discussed in more detail in the report.
GPS	Global Positioning System; a navigation system that uses satellites and receivers and is most commonly used to determine location.
Gravesite	A location where a human burial likely occurred, whether or not human remains are still present within the grave.
Ground-truth	Identification through visual inspection, following excavation or other means necessary for direct access, of an anomaly previously observed in geophysical data.
HCA	See *Heritage Conservation Act*.
Heritage	Any structure, object, site, quality, or thing that is considered of historical or archaeological significance by a community or people.

Term / Abbreviation	Definition
Heritage Conservation Act	The provincial Act that provides for the protection and conservation of heritage sites and objects within BC. All archaeological sites, whether or Provincial Crown or private land, including land under water, that predate AD 1846 are automatically protected under the HCA. Certain sites, including human burials and rock art sites with heritage value, are automatically protected, regardless of their antiquity. The HCA does not distinguish between those archaeological sites which are "intact" (i.e., those sites which are in a pristine, or undisturbed state) and those which are "disturbed" (i.e., those sites which have been subject to alteration, permitted or otherwise). All archaeological sites, regardless of condition, are protected by the Act, as described above.
Incised	A mark into the surface of an object.
In Situ	An object in its original position, that is, not disturbed.
Interment	The burial of human remains.
Lattice	An interlaced pattern or structure.
Mammalia	Any of a class of warm-blooded higher vertebrates.
Maker's Mark	A manufactures symbol.
NWSS	New Westminster Secondary School
Orthophoto	A geometrically corrected aerial photograph that can be used in a similar fashion as a map.
Pauper's Field	See Potter's Field.
Post-Contact	See Contact.
Potter's Field	A place for the burial of unknown or indigent people.
Pre-Contact	See Contact.
Project	New Westminster Secondary School Replacement Project.
Project Area	The area under investigation in this report is illustrated in Figure 2.
Provenance	The ownership history of an object.
Provenience	Information about the spot where an object came out of the ground.
Provincial Heritage Register	A centralized listing of protected heritage sites and objects located in BC.
RAAD	A web-based application for accessing information about heritage sites in BC.
Remote Access to Archaeological Data	See RAAD.
Residual Conductivity	In this investigation, it is a filtered version of the Apparent Conductivity where larger scale variations in background conductivity were subtracted in order to enhance more localized and subtle variations or anomalies.
SD40	British Columbia School District 40, located in New Westminster
Rim	The upper or outer edge of an object.
Signature	The overall variation in geophysical data that may be associated with specific subsurface conditions, or objects, that are different (anomalous) compared to background readings.
Site Inventory Form	A form used by the Province of BC to document archaeological site information in a consistent and standard format.
Subsurface Testing	A method used by archaeologists to locate and identify subsurface archaeological remains (e.g., shovel testing, auger testing).

Term / Abbreviation	Definition
Stratigraphy	In the context of this report, it refers to the vertical subsurface layering of soil and rock layers or horizons.
Surficial Geology	The geological study of the surface, or near surface of the earth.
Taxon	A taxonomic group of any rank, such as a species, family, or class.
Transfer Print	A method of decorating enamels or ceramics.

Table of Contents

TABLES

FIGURES

APPENDICES

APPENDIX A
Select Photos

APPENDIX B
Cultural and Institutional Groups Affiliated with Specific Cemetery Areas

APPENDIX C
Mechanical Test Excavation Results

APPENDIX D
Historic Artifact Analysis Results

APPENDIX E
Ground-truthed Geophysical Anomalies

1.0 INTRODUCTION

At the request of School District No. 40 (New Westminster) (SD40), Golder Associates Ltd. (Golder) provided heritage services, which included an archaeological impact assessment of archaeological site DhRr-233, in support of the New Westminster Secondary School Replacement Project ("Project") on SD40 property located at 735 Eighth Avenue (Lot 3, District Lot 2055, and DL5678, Plan EPP17131, Group 1, New Westminster District, NwID 1185900), New Westminster, BC ("Project Area") (Figure 1). Heritage work included: (1) geotechnical and geo-environmental borehole monitoring within and immediately adjacent to the area of archaeological site DhRr-233; and (2) mechanical testing of identified geophysical anomalies to determine the presence/absence of human remains and/or buried evidence of historical cemetery use within the Project Area. This report summarizes the results of the archaeological impact assessment conducted between November 14 and December 13, 2016 and provides heritage recommendations for the duration of the Project.

2.0 PROJECT DESCRIPTION

2.1 Development Description

SD40 commenced work on the New Westminster Secondary School Replacement Project, beginning with background preparation for the Project in the mid-2000s. Following announcement of the Project's funding approval on June 7, 2016 (SD40 2016a, 2016b), site-specific studies, including geophysical, geotechnical, geo-environmental, and heritage investigations, have taken place to further characterize the property.

Anticipated to open in 2019, with construction starting in 2017, the new school will accommodate 1,900 grade 9 to 12 students. The new school will replace the existing school that was built in 1949. Past historic uses of the Project Area, which include cemeteries, two isolation hospitals, a public works yard and a staging area with military barracks set up during the Second World War. SD40 and the Ministry of Education have committed that no construction will take place on known burial areas; therefore, the exact siting at the current location has yet to be determined.

Students will continue to attend the old school until the new school is complete. The old school will be demolished following occupation of the new school followed by appropriate memorialization (SD40 2016a, 2016b).

2.2 Project Area

The area under investigation in this report (Project Area) consists of approximately 6.4 hectares (ha) of grass playing field, paved lane and parking surfaces, and buildings including much of the existing New Westminster Secondary School (NWSS) (Figure 2; Appendix A Photos 1 and 2). It is located at 735 Eighth Avenue, New Westminster, BC, and is bounded by Tenth Avenue to the northwest, Sixth Street to the northeast, Eighth Avenue to the southeast, and Eighth Street to the southwest. Existing school infrastructure occupies most of the western portion of the block between Sixth Street and Eighth Street (Figure 2). The Project Area excludes the properties occupied by Mercer Field, Moody Park Arena, and Thornebridge Gardens Retirement Community (this property is also an historic site, DhRr-51). A cemetery area (2.28 ha), dedicated under the *Cremation Interment and Funeral Services Act* (CIFSA), is located north and west of the Project Area; the area is also registered as historic site DhRr-401 in the Provincial Heritage Register (PHR). Most of archaeological site DhRr-233 is located within the Project Area, and this overlapping area of 4.14 ha corresponds with the permit area defined in *Heritage Conservation Act* (HCA) permit 2016-0377 (Figure 2).

Geophysical investigations in 2016 were undertaken on the accessible grass and paved areas primarily located with the bounds of site DhRr-233 (Figure 3). The Project Area has been subdivided into five smaller staged investigation areas or "Stages" for the purposes of Golder's heritage, geotechnical, and geo-environmental investigations. The staged investigation areas represent physical areas and also reflect the sequence of investigations as they were conducted in the field; these are illustrated in Figure 3 and described below:

- The Stage 1 area (2.21 ha[4]) consists of the playing field located to the east of archaeological site DhRr-233, immediately south and west of Mercer Field and north of Moody Park Arena.

[4] These stages include only surfaces (grass or pavement) that are currently accessible for possible testing, and the estimates of area reflect this.

- The Stage 2 area (0.32 ha) consists of an asphalt roadway and parking lot bordered by temporary or portable buildings to the west and the high school (Lester Pearson Wing) to the north. It is located within the boundary of archaeological site DhRr-233.
- The Stage 3 area (0.45 ha) consists of the central and southern portion of the playing field immediately west of Mercer Stadium. It is located within the boundary of archaeological site DhRr-233.
- The Stage 4a area (0.20 ha) consists of the northern portion of the playing field immediately west of Mercer Stadium. It is located within the boundary of archaeological site DhRr-233.
- The Stage 4b area (0.70 ha) consists of the area surrounding the school's gymnasium on the north side of Massey Theatre and adjacent to the Vincent Massey wing of the high school and extends northward between the school and temporary or portable buildings and soil storage area. It is located within the boundary of archaeological site DhRr-233.

The heritage investigations will be described herein using these Stages.

2.3 Relevant Legislation

The following legislation is relevant to the Project in that it applies to land within or directly adjacent to the Project Area.

2.3.1 Heritage Conservation Act

All archaeological sites located on Provincial Crown or private land that predate or are assumed to predate AD 1846 are automatically protected under the HCA. Specific site types, including burial sites are protected regardless of age, if they have heritage value. Inspection, investigation or alterations to archaeological sites require a permit issued by the Archaeology Branch, Ministry of Forests, Lands and Resource Operations.

2.3.2 Cremation Interment and Funeral Services Act

The CIFSA is administered by the Business Practices and Consumer Protection Authority (BPCPA) and provides specific details and regulations for cremation, cemetery and funeral services in BC. It outlines the legislated process for the establishment, operation, and closure of cemeteries and crematoria. All operators or funeral providers are responsible for ensuring the place of interment or crematorium is operated in accordance with CIFSA. Relevant to this Project is Part 4 of the Act (Exhumation, Disinterment and Removal of Human Remains).

Prohibition on removal of remains

Section 19:

2) A person must not disinter or remove human remains, or any part of human remains, from the place they are interred unless the disinterment or removal is in accordance with

(a) this Act, the *Coroners Act* and the regulations under those Acts, or

(b) a permit or an order under the *Heritage Conservation Act*.

3.0 PROJECT OBJECTIVES

The objectives of the heritage investigations are to: (1) identify, record, and assess heritage features, including gravesites; (2) identify and evaluate possible impacts of the proposed school replacement to these features; and (3) recommend appropriate impact management actions. The archaeological impact assessment was conducted in general accordance with the 1998 *British Columbia Archaeological Impact Assessment Guidelines* (Guidelines) developed by the Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations.

Current heritage investigations consisted of two parts: (1) geotechnical and geo-environmental borehole monitoring; and (2) mechanical test excavations.

3.1 Monitoring of Geotechnical and Geo-Environmental Investigations

The results of geophysical investigations were used to select borehole locations and to avoid geophysical anomalies that may be potential gravesites. Archaeological monitoring was undertaken as an added precaution should human remains or suspected human remains be encountered during drilling activities within archaeological site DhRr-233 and select locations immediately adjacent.

3.2 Mechanical Test Excavations

The objectives of the mechanical excavation program were to ground-truth geophysical anomalies identified as potential gravesites to determine if there is evidence of historic cemetery use in the Project Area and determine where gravesites and human remains may be found within archaeological site DhRr-233.

4.0 BACKGROUND INFORMATION

During the planning process for the new secondary school in the mid-2000s, SD40 recognized that archival research was required prior to proceeding with school replacement, and specifically to identify any potential constraints related to former cemetery use on the subject property. Time-limited archival research was undertaken at a number of repositories in the Lower Mainland and Victoria and a report was prepared (Golder 2008). The records are incomplete, and there is consequent uncertainty about the exact location or extents of some historical site uses.

In the spring of 2016, Golder was made aware of Order-in-Council (OIC) 92-291 regarding construction of the Quarantine Hospital, New Westminster, which was approved on July 16, 1892. The OIC includes a plan drawing showing the New Westminster street grid, the proposed location of a quarantine hospital and a Potter's Field[5] at the corner of Eighth Street and Eighth Avenue (Province of British Columbia 1892) (Figure 4).

The sections that follow summarize the historical use of the property as a burial site and its subsequent use history. The latter may provide some insights into historical land disturbances that would have affected burials, if present in those areas impacted. With the exception of material found in OIC 92-291, the discussion that follows is derived from Golder (2008) and the reader is referred to that document for further detail.

4.1 Summary of Past Historical Uses in and Adjacent to the Project Area

The western boundary of the Project Area extends to Eighth Street, which was formerly the Douglas Road. As part of the initial road survey, the Royal Engineers roughly surveyed an area of adjacent forest in response to a request from the City of New Westminster for a new site for a public cemetery (Golder 2008:4). A half-acre of newly cleared and levelled land, located opposite the modern location of Dublin Street, became available for interments in 1861 (Figure 4). The cemetery area gradually grew over a nearly 60-year span as areas were filled in succession with burials. The last active area was closed to interment circa 1920.

Historical construction over former burial areas may have begun as early as 1892 with the construction of the first isolation, or quarantine, hospital and the hospital access road (Golder 2008:9). The cemetery use and subsequent historical uses of the land are summarized separately in the following sections.

4.1.1 Cemetery Use

Insight into the nature and extent of burial areas from archival sources is sometimes confused by the use of different names which may not always reflect the specific cemetery areas addressed in the sources, and the lack, or ambiguity, of contemporary survey data with respect to the location and extent of actual burials (Figure 5). The history and interpretation of cemetery use overall is constrained by a relative paucity of both archival records related to these operations and burial information (Golder 2008:15).

Early archival sources frequently refer to the area as the Douglas Road Cemetery, but it has also been referred to as simply the Burial Ground, as well as the New Westminster Public Cemetery, New Westminster Cemetery, Columbia Cemetery, Douglas Road Cemetery, and Eighth Street Cemetery. Names for specific burial areas within the larger cemetery area include Potter's Field, Pauper's Field, Chinese Cemetery, and Douglas Cemetery (Golder 2008:5) (Figure 5).

[5] A place for the burial of unknown or impoverished people.

Survey information from the19th century typically refers to lands "reserved" or "set aside" for cemetery use, before or notwithstanding the actual development of the land for that use. Reference is also made and sometimes mapped regarding lands "cleared", which may simply mean that the area was logged. The additional preparation of the land required before its use as a cemetery area, including stump and brush removal, and ground levelling may or may not be included in areas identified as "cleared", at least initially. Furthermore, some of the cleared ground may have become subsequently overgrown requiring it to be cleared for a second and possibly third time before use. The total size of the Cemetery Reserve addressed in Colonial Government and City Council documents between 1861 and 1864 ranged from 20 to 32 acres (Golder 2008: 5, 6); the size of the whole block between Sixth and Eighth Streets and Eighth and Tenth Avenues is approximately 34 acres (13.7 ha). Much of the area was assessed as "swamp and therefore unavailable for burying purposes"[6] with the result that the slightly larger portion of this area on the Sixth Street side of the block was never cleared for cemetery use, and it may have remained forested until 1915 (Golder 2008: 12).

Golder's report (2008) identified four cemetery areas representing distinct operational periods as well as distinct cemetery areas as defined by their operators, cultural practices, administrative processes, and pattern of interment. To this we would add an additional area, the Potter's Field, based on the recent discovery of a survey map providing its "set aside" outline, although its general location and period of operation is similar to the old Chinese cemetery (Figures 4 and 5). Table 2 includes the five basic cemetery areas named as they will be throughout this report and their current location and status. Some historical details are provided for each area in the sections which follow.

Table 2: Cemetery Areas with Years of Operation and Current Status

Cemetery Name	Interment Years	Current Location
New Westminster Public Cemetery	1861 – ca. 1907	Dedicated Cemetery Area (DhRr-401)
The 'Old' Chinese Cemetery	1892 – 1909	Archaeological site DhRr-233
The Potter's Field	ca. 1892 – ca. 1907	Archaeological site DhRr-233
Douglas Cemetery	1908 – ca. 1920	Dedicated Cemetery Area (DhRr-401)
The 'New' Chinese Cemetery	1909 – 1914	Archaeological site DhRr-233

4.1.1.1 New Westminster Public Cemetery

After the initial clearing of cemetery land in 1861 a contract was issued in 1865 to clear a further 5 acres "20 chains in length along the side of the Douglas Street Road, and 2 ½ chains in depth"[7] (Golder 2008:6), a distance representing the length of Eighth Street between Eighth Avenue and Tenth Avenue with an offset of 50 m. Most of this 5 acres of cleared land was not initially used for burials, based on the land needing to be cleared again in 1892 for the Chinese Cemetery, assumed to be south of the original half-acre cemetery area, and additionally cleared in 1908 for the Douglas Cemetery located to the north of the original half-acre cemetery (Golder 2008:22, 23). Further "clearing" of an uncertain area was conducted in 1876 (Golder 2008:8) and, based on the "Old Cemetery" fence line surveyed in 1914 (Burnett and McGugan 1914), the area used as the New Westminster Public Cemetery from 1861 to ca. 1907 consisted of about 1.64 acres (0.66 ha). This was located approximately the centre of the block between Eighth Avenue and Tenth Avenue extending up to 50 metres from Eighth Street (Golder 2008:34) (Figures 4 and 5). By 1908, the "Eighth Street Cemetery" was reported by the City Sanitary Inspector to be full (Golder 2008:10).

[6] *The Daily Columbian,* June 30, 1904, p. 4 "Graves at a Premium".
[7] Public Archives of BC, Colonial Correspondence, Lands and Works Department – 1865 Tenders, File 963T

4.1.1.2 The 'Old' Chinese Cemetery

In 1892, City Council agreed to a request by the City's Chinese Benevolent Association to develop its own section of cemetery "adjacent to Douglas Road" complete with an "altar and crematory" (for offerings) in exchange for Chinese residents "clearing the site of underbrush and trees" (Golder 2008:9, 22). No historical survey data are available regarding the size and exact location of the Chinese cemetery established in 1892, but it is assumed, because it appears not to have been in conflict with the Douglas Cemetery subsequently constructed north of the New Westminster Public Cemetery area, to have been located south of the original cemetery area (Golder 2008:33) (Figures 4 and 5). It was reported in 1907 that "all the available lots [in the Chinese Cemetery were] occupied with about three exceptions"[8], despite the Chinese cultural practice of exhumation. In June of 1907, about 80 bodies (exhumed remains) were reportedly shipped back to China."[9]

4.1.1.3 Potter's Field

In the same year as the separate Chinese cemetery was established (1892), an isolation or quarantine hospital was built in response to a smallpox outbreak. The 12-bed hospital was located near the centre of the lot, effectively defining the eastern limit of the cemetery (Golder 2008:33) (Figure 6). In a plan accompanying OIC 92-291 granting the city land for the hospital's construction, the roughly square perimeter of a "Potter's Field" is indicated (Province of British Columbia 1892) (see Figure 4). This plan provides a scaled area of approximately 1.56 ha. No other cemeteries are shown on the plan, and it is not clear if the outline indicates an existing or proposed field, or to what extent the land had been cleared, although we do know that the Chinese were at the same time clearing land (for at least the second time) in an area adjacent to Eighth Street which may overlap the "Potter's Field" perimeter as mapped.

A road to the isolation hospital was also built in 1892 which cut diagonally through the "Potter's Field". Cemetery use might have occurred on both sides of the road in this area as is suggested in the 1892 plan; however, on a 1914 plan by surveyors Burnett and McGugan, the land west of the road is described as "cleared land" while the land to the east is described as "slashed and burnt", perhaps indicating that the east side of the road had never been used for burials. In regard to the extent the Potter's or pauper's field that was cleared and available for use in 1904, the press reported, "all [the land in the Pauper's Field] that has been cleared has been used"[10] (Golder 2008:10).

4.1.1.4 Douglas Cemetery

Following staff reports in 1908 (see section 4.1.1.1) that the New Westminster Public Cemetery was full, as was the Potter's Field, City Council immediately undertook action to make more land available for cemetery use. As the City's proposed new public cemetery in Sapperton was not yet surveyed and developed to allow for its use, Council decided to open a new section of land for burials on the Cemetery Reserve (Golder 2008:10). In January,

[8] *The Daily News*, Feb. 9 1907 p.1 "City Cemeteries are Becoming Overcrowded".

[9] *The Daily Columbian*, June 4, 1907, p.1 "Uncanny Custom".

[10] *The Daily Columbian*, June 29, 1904 p. 5.

1908, it was recorded that: “Alderman Gray verbally reported from the special committee…. [that] they met at the cemetery and selected four acres of the most suitable part, two acres for the use of the Asylum and two for City, [and] recommended that those four acres be cleared and a suitable roadway made from Eighth Street – Report Adopted”[11].

The “Douglas Cemetery” burial plot plan was designed by City Surveyor A.J. Hill in a traditional cross-axial layout pattern with two sections of two acres each, Section A for the Asylum and Section B for the City[12] (Figure 4). These four acres were considered the “most suitable land”, of the remaining Cemetery Reserve (Golder 2008:10, 23). A system of 38 numbered blocks made up each section. Each of the larger, regularly shaped blocks contained 42 burial plots measuring 8 feet by 4 feet. This structured layout and the records that went with it is in sharp contrast to previous practises observed at the New Westminster Public Cemetery, “the greater part of which seem to be placed without any regard to regular order.”[13] The operation of the Douglas Cemetery is understood to have been actively used by both the City of New Westminster and the Provincial Government from 1908 until 1920 (Figure 5).

4.1.1.5 ‘New’ Chinese Cemetery

In 1908, action to create a new Chinese Cemetery was taken after the Chinese Benevolent Association of New Westminster hired lawyer J.P. Hampton Bole to request that City Council provide land within the Douglas Cemetery for a new separate cemetery to be set aside for their exclusive use (Golder 2008:11, 26, 27). Sanitary Inspector Pearce reported to Council that the old section of the cemetery (“old” Chinese cemetery) was full and suggested that the new cemetery (Douglas Cemetery) now being cleared should be divided into blocks and that a number of them should be set aside exclusively for the Chinese community.[14] Council responded to the request with an offer to set aside two acres for the Chinese Benevolent Association adjoining the (newly) surveyed Douglas Cemetery.[15]

On March 29, 1909, City Surveyor A.J. Hill created a new survey plan which was attached to a Lease Agreement signed between City of New Westminster and the Chinese Benevolent Association for two acres of land fronting on Tenth Avenue (Figure 5). In 1914, the Province advised the City of its decision to grant New Westminster a Crown Grant for ownership of the former Douglas Road Cemetery, which did not include the area it had leased to the Chinese Benevolent Association. Council immediately instructed its solicitors to cancel the lease agreement with the Chinese Benevolent Association which took effect on November 6, 1914.

Complaints from Burnaby residents adjoining Tenth Avenue about the Chinese Cemetery in 1913 suggest that there may have been active use of the new Chinese Cemetery on Tenth Avenue for burials (Golder 2008:26). The 1914 survey of the Cemetery by Burnett and McGugan shows that the Chinese Cemetery was cleared and fenced. However, the extent of its use is unknown. After the order to revoke the lease in 1914, it was reported in the press

[11] City Council Minutes, January 13, 1908.

[12] Plan of Douglas Cemetery, Surveyed by A.J. Hill, 1908.

[13] *The Daily Columbian,* November 3, 1892 p. 3 “A Neglected Cemetery”.

[14] *The Daily News*, October 20, 1908 p. 1 “Chinese Burials”; City Council Minutes: October 12, 1908 Volume 7, p. 118.

[15] *The Daily News*, December 1, 1908, p. 3 “Misc.”.

that "the Chinese Association had spent $1,000 in improving this property, and so far there have been no burials in it…"[16]. If it was used, given the low number of burials likely over the short duration of the land's availability, it is probable that gravesites would not likely have been placed far into the property from Tenth Avenue. Applications for exhumations from the "Eighth Street Cemetery" on behalf of the Chinese community were being received as late as 1919[17].

4.1.1.6 Use of Cemetery Areas by Cultural and Institutional Groups

The religious and ethnic affiliation of individuals who may be located within burials in areas subject to field investigations has been of interest to community stakeholders and First Nations. This information is relevant to the culturally appropriate treatment of human remains which may be encountered, and is information which may be useful in interpreting both the geophysical and physical record. A summary of cultural and institutional groups, the dates when they would likely have been burying dead in the cemetery, as well as the locations where the burials likely or possibly occurred are listed in Appendix B.

An early effort to sub-divide the newly established New Westminster Public Cemetery according to religious denominations was reversed by the Colonial Government in 1865 (Golder 2008:5, 6), and the cemetery remained non-sectarian. One result of this was that various religious and fraternal organizations, representing a fairly significant part of the established community of New Westminster, stopped using the New Westminster Public Cemetery, beginning with the Anglican Holy Trinity Parish in 1869. The following lists the groups that acquired (and, if appropriate, consecrated) new plots for their parishioners or members in cemeteries located in Sapperton, (now amalgamated as the Fraser Cemetery) and the years when these moves to Sapperton occurred:

- Anglican (Holy Trinity Parish), 1869 (Golder 2008:6)
- Wesleyan (Methodist congregation), 1870 (Golder 2008:27)
- Presbyterian (St. Andrew's congregation), 1870 (Golder 2008:27)
- New Westminster Masonic Lodge, 1872 (Golder 2008:7)
- New Westminster's Independent Order of Oddfellows, 1881 (Golder 2008:8)
- Roman Catholic (St. Peter's Parish), 1883 (Golder 2008:8)

The New Westminster Public Cemetery was also used from its inception by the City of New Westminster for the burial of the poor and homeless and those unaffiliated with family or religious group, or "indigents", and also by the Royal Columbian Hospital for the burial of some patients and stillborn infants. The city and hospital burials would be less likely (than the burials of established religious, fraternal or culturally specific organizations) to include higher quality (longer lasting) coffins, or grave goods and grave markers which might indicate either the identity or ethnicity of the person buried. Other institutions, including the Public Hospital for the Insane and the B.C. Penitentiary (from 1876), and the New Westminster Gaol (from 1879) would also have interred patients and

[16] *The British Columbian*, November 16, 1914, p. 5 "Protests to City Council".

[17] City Council Minutes, June 23, 1919.

prisoners in the New Westminster Public Cemetery. Between about 1892 and 1908 these city and institutional burials would likely have been placed somewhere in the Potter's Field. Beginning in 1908, all city and institutional burials, now including some from Essondale and Oakalla Prison Farm, would have occurred in the Douglas Cemetery.

People from a full range of resident ethnic communities, with a corresponding potential range of burial practices, would have had graves located in the New Westminster Public Cemetery (Golder 2008:28). In addition to the First Nations and Chinese who lived in the area prior to the cemetery opening in 1861, a Japanese community would have been resident from the 1870s, and the Sikhs were reported to have practised cremations at the cemetery from about 1905 until 1913, when abandonment of the practise was ordered by City Council (Golder 2008:12). Apart from the two exclusive burial areas set aside for the Chinese community between 1892 and 1914, there are no known reports of burial practices representing any other specific ethnic community occurring in the Project Area (i.e., outside of the New Westminster Public Cemetery and Douglas Cemetery).

An important Chinese burial practise was exhumation, conducted throughout the period of cemetery use (CINARC 2017). The duration of burial was intended to allow for the decomposition of the soft tissues. The bones were then recovered and prepared by Chinese community organizations for repatriation to China. Because the burials were of relatively short duration, the graves may have been relatively shallow. Complaints were voiced in the New Westminster press about burials as shallow as "three to 15 inches below the surface"[18]. While it is certain that exhumation led to the removal of many bodies, in the absence of better documentation it is not assumed that all were removed. Chinese graveyards have been archaeologically documented in western North America where not all the burials have been exhumed (e.g., Smits 2008).

4.1.2 Impacts of Past Uses in the Project Area

The first building located on the cemetery reserve was the isolation hospital built in 1892. The hospital was located east of the area where burials seem to have occurred (Figure 6). The access road, including a wooden walkway, cut diagonally through the area where the Potter's Field may have been (in part of Stage 4b). The original hospital (presumably wood frame with minimal foundations) was destroyed by fire in 1911, but was replaced by a new Isolation Hospital, with outbuildings, constructed using concrete block (Golder 2008:9) (Figure 6). The new hospital was located in Stage 2, an area where no graves were likely located. However, given the poorly defined limits of the Old Chinese Cemetery and Potter's Field, the possibility of burials from these areas having extended to near the new hospital building has been considered (see Figure 5).

In 1915, the City of New Westminster constructed new city stables and a works yard which covered the entire area thought to contain the Potter's Field and Old Chinese cemetery (Golder 2008:11). Although the building of the substantial stable (likely with foundations) and yard with city works sheds likely caused considerable disturbance (all within Stage 4b), there seems to be no contemporary account of the removal of typical cemetery features and structures, such as gravestones or the Chinese altar and crematory, or disturbance of burials (Figure 6).

A small (280 feet by 150 feet [85 m by 46 m]) Memorial Park was set aside by Council in 1939 as part of a larger vision to subdivide and develop the remaining cemetery reserve area (Golder 2008:30). After the declaration of

[18] *The British Columbian,* October 17, 1883, p. 3 "The Public Cemetery".

World War II, these plans for development were shelved and Council agreed to lease the property to the federal Department of National Defence for the construction of army barracks on the site at the corner of Eighth Street and Tenth Avenue (Figure 6). The barracks were quickly built over an area which included the Douglas Cemetery and the New Chinese Cemetery area (Stages 3 and 4a). The press reported that the Douglas Cemetery, or "the upper part of the slope will be leveled with tractors and that part will be the first built on".[19] Another report from just two years previous described the abandoned cemetery as an "overgrown field [with] rows upon rows of regularly shaped depressions, …some few still marked by headstones, [but all lying]…flat on the ground, covered with moss and leaves, some broken and scattered far and wide."[20] The 18-day turn-around time between Council approval for the military use and the undertaking of the construction work, suggests that exhumations may not have proceeded properly, if at all. There are no reports of burials being disturbed, although there is documentation indicating that the military project may have moved or eliminated some burial markers and other evidence of graves (Golder 2008:31).

The City Works Yard and Stable were demolished in 1948 as the City initiated a land clearing contract for the construction of the new high school. The contract specified the removal of "existing buildings off the site, also remove all foundations, concrete floors, curbs and walks, also the existing water and sewer services, gas pumps and tanks, and all other obstructions which will interfere with the erecting and completing of the proposed building scheme."[21] Removal of a "heavy concrete vault" associated with foundations of the Waterworks Office (location uncertain) is also mentioned.[22] Cutting and filling was referenced with written instructions limited to "no fill shall be deposited within the area occupied by the proposed buildings", although an accompanying sketch plan indicates that "5,000 yards" of material would be removed ("cut") from beneath the school opposite the lane between Dublin Street and Edinburgh Street (representing up to about 2 m depth of material removed, before excavations for school foundations) and placed as "fill" in the now grass-covered areas extending to the corner of Eighth Street and Eighth Avenue.[23] The cemetery was part of the area that was to be leveled by the bulldozers, and some apprehension was expressed over encountering "Ancient" and specifically "Chinese bones"[24] prior to undertaking the work. However, only the uncovering of a single coffin was reported in 1949 as the land was being levelled for the construction of the Massey Junior High School, completed the same year (Golder 2008:33) (Figure 7).

Research undertaken to date has yielded no evidence of any major exhumation activities by either the Province of British Columbia or the City of New Westminster prior to the Site being transferred to the New Westminster School Board in 1950 (Golder 2008:28). Construction of deep foundations for the permanent school buildings (Pearson Senior High School was constructed in 1954 and the School District Administration Building at the site in 1955) may be presumed to have led to the complete destruction and removal of any burials located underneath. This would extend an uncertain distance around the perimeter of the buildings possibly including beneath paved surfaces and landscaped areas. Most of this built and landscaped area is now located in the dedicated cemetery

[19] *The British Columbian*, October 30, 1939, p. 1 "Regiment to Move to City Property Soon".

[20] A.H. Williamson, *The Vancouver News-Herald*, November 29, 1937, p. 1 "There Lie the Remains of…Pioneers".

[21] City contract to Mr. Evans for Reclearing of the site for proposed new school buildings at Eighth and Eighth Avenue, New Westminster, BC. Dated February 11, 1948.

[22] Correspondence from Northern Construction Company (John Keay, General Superintendent) to City (R.E. Potter, City Engineer). Dated November 16, 1948.

[23] City contract to Mr. Evans for Reclearing of the site for proposed new school buildings at Eighth and Eighth Avenue, New Westminster, BC. Dated February 11, 1948

[24] *The British Columbian*, February 11, 1948, p. 1 "Old Bones Under Site of School".

area (DhRr-401), however, it also extends south over the area formerly occupied by the Old Chinese Cemetery and the Potter's Field (see Figures 5 and 6).

Some parts of the school have since been demolished or removed, including a section joining the Massey Junior High School with the gymnasium (and Massey Theatre), a boiler house which was formerly located under the portable structures within the Stage 2 area, and two underground storage tanks, also located in the Stage 2 area (Figure 6). The boiler house was connected by underground tunnels to the school buildings located both to the north and south of it. The existence of these structures created localized areas where surviving burials are no longer expected due to the depth of subsurface disturbance, most of which is also evident in the geophysical record.

4.2 Provincial Heritage Register Data

A Provincial Heritage Register search was completed to identify previously recorded archaeological and historic sites within or immediately adjacent to the Project Area. In addition to archaeological site DhRr-233, two historic sites (DhRr-51 and DhRr-401) are located immediately adjacent to the Project Area (see Figure 2). These three sites are summarized as follows.

4.2.1 Archaeological Site DhRr-233

Site DhRr-233 was added to the Provincial Heritage Register based on Golder's assessment of historical data with respect to the possible extent of cemetery use on the SD40 property. Based on available information, this area is considered to have lower potential for the presence of burials in comparison to the location identified in the October 30, 2009 Certificate of Public Interest to designate New Westminster Cemetery as a Place of Interment on the land (Figure 7) (see Golder 2008). Prior to the investigations detailed in this report, DhRr-233 was subject to both invasive and non-invasive investigations which are briefly summarized as follows.

In 2007, Golder archaeologists monitored the drilling of 46 geo-environmental boreholes throughout the SD40 property to address the potential for encountering human remains or historically significant artifacts (Figure 7). Thirty of the boreholes were located within the boundary of DhRr-233. No human remains or historically significant artifacts were encountered (Golder 2007; 2008b).

In 2011, Golder was asked to visit the NWSS site to assess the installation of underground electrical services and new classroom portables (Figure 7). The underground electrical services and new portables were located between the Pearson and Massey Wings, within the boundary of DhRr-233. The trench containing the installed electrical services was approximately 10 m long, 0.3 m wide and 0.45 m deep. No impacts to cultural deposits were noted (Golder 2011).

In 2012, on behalf of the City of New Westminster, Golder conducted archaeological monitoring for five water main connection upgrades and one fire hydrant replacement within DhRr-233 on Eighth Street between Edinburgh Street and Tenth Avenue (Figure 7). No evidence of burial features, human remains or other significant cultural materials was encountered. Historic materials (e.g., butchered animal bone, glass and ceramic shards and metal objects) observed in the fill are related to modern development of City of New Westminster road and underground

service infrastructure through the redistribution of local sediments and the introduction of fill materials (Golder 2016).

Archaeological monitoring associated with the installation of a sanitary sewer within DhRr-233 was undertaken by Golder for SD40 in 2013 (Golder 2014a). The Project involved the installation of a new sanitary sewer line from an existing school building to a portable complex (Figure 7). An irregular trench, 4.5 m in width, was excavated from the southeast corner of the existing building for 1.3 to 2.8 m before turning south for 4.0 m and east for 4.0 m to 6.0 m towards newly installed portables. The trench was excavated to a maximum depth of 1.2 m below surface. A portion of the trench is located in the footprint of the previously demolished School Board Administration building. No human remains or associated cultural materials were identified during the monitoring.

Non-invasive geophysical investigations were carried out within the limits of DhRr-233 in 2012 and 2016 using a combination of electromagnetic conductivity mapping (EM) and ground penetrating radar (GPR) (Golder 2014b, 2017a). Work in 2012 focused on two areas adjacent to Eighth Street and one area south of Tenth Avenue (Figure 7). Potential grave-related signatures were identified in the survey areas adjacent to Eighth Street and none were identified in the survey area south of Tenth Avenue (Golder 2014b). Wide area EM and GPR work undertaken in 2016 by Golder identified a number of potentially grave-related signatures within DhRr-233 which were the focus of the archaeological investigations reported here (Golder 2017a).

A notation on the British Columbia Site Inventory form for DhRr-233 indicates designation under Section 18 (Promotion of Heritage Value) of the HCA has been proposed by the BC Heritage Branch (Ministry of Forests, Lands and Natural Resource Operations). The designation is strictly commemorative in nature and requires an Order in Council to be passed for it to take effect.

4.2.2 Historic Site DhRr-51

Site DhRr-51 is an historic place located adjacent to the Project Area at the corner of Eighth Avenue and Sixth Street (see Figure 2). This historic designation is for the Loyal Protestant Orphanage Home located at 601 Eighth Avenue. Building construction began in 1925, and the center was officially opened in 1928. The building was designed by the E. Evans and Son architectural partnership in a Tudor Revival and British Arts and Crafts style that was adapted for institutional purposes. At its peak, the building housed up to 65 children, was later converted to a home for handicapped children and is, with recent additions, now operated as the Thornebridge Gardens Retirement Community.

4.2.3 Site DhRr-401

The location of DhRr-401 is the same area identified in the October 30, 2009 Certificate of Public Interest to designate New Westminster Cemetery as a Place of Interment on the land (see Figure 2).

In 2007, Golder conducted an EM and GPR reconnaissance of a portion of DhRr-401 to assess the potential for remaining unmarked gravesites in the New Westminster Public Cemetery and the Douglas Cemetery (Golder 2009). The results of this investigation included numerous localized subsurface signatures that were potentially indicative of unmarked gravesites but could, however, be due to other unidentified natural or cultural sources, and no further investigations were conducted within this area (Figure 7).

Heritage site DhRr-401 was added to the Provincial Heritage Register by the BC Heritage Branch who intend to designate the area under Section 18 (Promotion of Heritage Value) of the HCA. The designation is strictly commemorative in nature and requires an Order in Council to be passed for it to take effect.

4.3 Community Interests and Involvement

Given the cemetery history and the large number of cultural groups and organizations associated with it, the HCA permit application was distributed widely for review and comment. This list included First Nations groups identified in the Province's Consultative Areas Database Internal Map Application, cultural groups known or suspected to have used parts of the NWSS property for burial purposes, and First Nations, community groups, or fraternal organizations with members that records indicate were interred on the land whether the interments were located within the Project Area or the dedicated cemetery area (Table 3). The Tsilhqot'in National Government was included given their interest in the identification and recovery of the remains of Chief Ahan who was executed in New Westminster in 1865[25]. In conjunction with the permit application referral, representatives of SD40 and Partnerships BC made telephone contact with many of the permit application referral recipients.

Table 3: Community Interests and Involvement

First Nations	Cultural Groups	Religious Organizations	Community Groups
■ Council of the Haida Nation ■ Cowichan Tribes ■ Halalt First Nation ■ Hwlitsum ■ Katzie First Nation ■ Kwantlen First Nation ■ Kwikwetlem First Nation ■ Lake Cowichan First Nation ■ Lyackson First Nation ■ Musqueam Indian Band ■ New Westminster Indian Band ■ Penelakut Tribe ■ Semiahmoo First Nation ■ Stó:lō Nation People of the River Referrals Office ■ Stz'uminus First Nation ■ Squamish Nation ■ Tsawwassen First Nation ■ Tsleil-Waututh Nation ■ Tsilhqot'in National Government	■ Chinese Benevolent Association of Vancouver ■ Legacy Initiatives Advisory Council (LIAC) ■ Métis Nation British Columbia ■ National Congress of Chinese Canadians ■ National Nikkei Museum and Heritage Centre (Burnaby) ■ Khalsa Diwan Society (New Westminster	■ Diocese of New Westminster, Anglican Church of Canada ■ First Presbyterian Church, New Westminster ■ Holy Trinity Cathedral, New Westminster ■ Queens Avenue United Church, New Westminster ■ St. Peter's Roman Catholic Church, New Westminster c/o Gardens of Gethsemani ■ Vancouver School of Theology	■ Canadians for Reconciliation Society ■ City of New Westminster ■ Inclusion BC ■ Union Solomon Masonic Lodge

[25] Prisoners from the New Westminster Gaol were buried at the New Westminster Public Cemetery beginning in 1879, and likely at the gaol before that date, but the burial location for Chief Ahan is not recorded.

Golder applied for and received Seyem' Qwantlen Heritage Investigation Permit SQ 2017-43, Squamish Nation Archaeological Investigation Permit 16-0170, Stó:lō Heritage Investigation Permit 2016-143, and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094. Golder also applied for a Musqueam Indian Band Agreement to Conduct Archaeological Research within Musqueam Traditional Lands, but have not received a permit at the time of writing. Representatives of the Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, and Tsleil-Waututh Nation participated in field work between November 14 and December 13, 2016.

5.0 METHODS

5.1 Archaeological Impact Assessment Field Investigations

5.1.1 Geophysical Investigations

Prior to commencing subsurface investigations for archaeological as well as geotechnical and geo-environmental purposes in 2016, Golder conducted geophysical investigations consisting of electromagnetic (EM) mapping and ground penetrating radar (GPR) profiling of the Stage areas located within DhRr-233. Geophysical data were collected for almost all of the available surfaces (paved surface and grass playing field areas) between July 13 and August 23, 2016 (Golder 2017a).

Geophysical crews began by establishing two survey reference grids using chaining followed by RTK-GPS (sub-metre accuracy) of a number of grid corners. A combination of flagged golf-tees, pin flags, and marking paint were used for visual identification of the grid within the Project Area. Key landmarks were mapped into the grid for geographical reference and to facilitate data interpretation. The local grids correspond with the layout of the city blocks in the area and they are about -40 degrees off the geographic grid. The northern grid ("N") covers Stages 3 and 4a[26], while the southern Grid covers Stages 2 and 4b[27]. All directions in the remainder of this report will reference the local grids.

Initial surveying began with EM and measured soil electrical conductivity averaged over the investigation depth. EM mapping provides efficient delineation in plan view of lateral variations in soil type (possibly indicating buried channels for instance), soil conditions (including areas of disturbed ground and differing soil moisture levels), subsurface infrastructure, buried debris (metallic and non-metallic), and more subtle signatures potentially indicative of unmarked historic gravesites. Additionally, typical grave shaft dimensions necessitate that the EM-38 survey readings are acquired on a 0.5-m grid to record at least two to three readings within a gravesite dimension (Conyers 2006). Gravesites can produce an anomalous response from the caskets (including non-metallic), and/or from related metal and voids, as well as from a change in soil conditions (or type) from the back-filled soil, including potentially from the grave shaft of an exhumed burial (Conyers 2006). A Geonics EM-38 with an investigation depth (70% cumulative response) of approximately 1.5 m was the principal instrument used for the EM investigations.

Representative EM signatures were subsequently investigated by GPR to provide a cross-sectional perspective with depths and further assessment of potential burials (e.g., Figures 8 and 9). GPR measures radar reflections due to changes in soil electrical properties at soil interfaces (e.g., an original ground surface), can detect disturbance in a subsurface layer (i.e., where it has been dug into and refilled for some purpose, including a possible grave shaft), buried infrastructure (e.g., pipes, foundations, footings), and from discrete objects such as cobbles, buried debris, voids, and possibly caskets. The investigation depth of GPR could be up to 3 m or more, depending on soil conditions at the time of the survey. The detection of anomalies by any geophysical method depends on the contrast in material properties and, therefore, anomalies having a lower contrast compared to the host material produced a more subtle anomaly.

[26] Stages 3 and 4a are identified as Area 1 and Area 3 in Golder 2017a.

[27] Stages 2 and 4b are identified as Area 2B and Area 4 in Golder 2017a.

5.1.1.1 Analysis of Geophysical Anomalies for Subsurface Investigation

Analysis of the geophysical data revealed 659 anomalies; a simplified image of these is produced in Figure 10. About 30% of these anomalies were classed as “subtle”, being less obvious in the EM record or requiring some data filtering to render them visible. As well as discreet anomalies, patterns were observed that were thought to correspond with buried infrastructure such as foundations, areas with high metal content (presumably buried metal debris or infrastructure), areas that might be described as pockets or larger former depressions filled with debris, and a possible buried stream channel (Figure 10).

The distribution of identified anomalies does not exhibit a clear or regular spatial pattern typical of most cemeteries (Conyers 2006). Given that any gravesites located outside of the planned Douglas Cemetery area might not be regularly laid out, other criteria for selection of potential gravesites among the anomalies were established as follows:

- EM anomaly footprint is approximately gravesite size (1 m x 2 m)
- Inferred metal response is not high (moderate to no metal response)
- Depth ranges from 0.4 to 2.0 m into what may be original ground, as determined from GPR (to include shallow burials reflective of recorded Chinese burial practices)

Interpretation of the current geophysical reconnaissance results identified 38 anomalies that exhibit EM and/or GPR signatures that together are consistent with potential gravesites (these geophysical anomalies exhibit all of the expected gravesite criteria outlined above). All of the potential gravesite anomalies have depth estimates determined from GPR profiles (e.g., Figures 8 and 9). These targets also primarily occur within Stages that are suspected to have the greatest potential for gravesites based on historical records. In particular:

- 20 potential gravesites were identified within the northern half of Stage 4a.
- 15 potential gravesites were identified within the southwestern portion of Stage 4b.
- 3 potential gravesites were identified near the northwest edge of Stage 4b.
- The most compelling of the potential gravesites were located in a row of three to five geophysical anomalies located in Stage 4a at approximate depths ranging from 2.5 to 3 m, or approximately 1.3 to 2 m below interpreted fill layers. These are compelling primarily due to their depth, alignment and apparent lack of relation to shallower features.

The sample selection of anomalies for ground-truthing by mechanical testing would be an iterative process depending on results in the field. For instance, if a certain type of anomaly consistently matched a specific result, investigations of that type of anomaly might be abandoned and the sampling strategy adjusted. On the other hand, the finding of a gravesite would change the approach in that area from sampling to a methodology oriented toward defining the extent of burials in that area. However, the following rationale was a guide to the initial selection and helped formulate the anomaly sampling effort required to provide some confidence in the results:

- A minimum of 10 anomalies thought to represent material in fill.
- A minimum of five anomalies thought to potentially represent gravesites to confirm that gravesites are detectable in the geophysical record of the site, as well as to record the condition of the discovery (i.e., presence of coffin, associated material objects, human remains, or disturbed soil [possible exhumation]).
- A minimum of 15 anomalies of uncertain origin that have some, but not all of the characteristics expected for a gravesite, and particularly those with subtle signatures.

For the purpose of initial selection, anomalies which met the preceding sampling criteria were identified as "primary" anomalies for field investigations. Additional anomalies which were highlighted for sampling on a secondary level were described as "alternate" anomalies.

5.1.2 Monitoring of Geotechnical and Geo-environmental Investigations

All boreholes within the HCA permit area and three boreholes immediately adjacent to the permit area were subject to archaeological monitoring. The three boreholes outside the permit area were chosen for monitoring due to their proximity to the recorded archaeological site boundary (Figure 10). Where geophysical data were available (Stages 2, 3, 4a, 4b), borehole locations were selected to avoid anomalies.

Archaeological inspection consisted of visual observations, and selective hand sorting and screening (through ¼ inch mesh) of sediments exposed during machine assisted drilling activities. Auger flights from each monitored borehole were examined when available by the field crew to search for historic artifacts, human remains, anthropogenic soil layers and other cultural evidence. Field observations, including monitored depths, soil depths, and soil transition depths, were recorded using field notes and photographs.

Golder personnel conducting the drilling at locations outside of the HCA permit area where an archaeological monitor was not present were made familiar with the procedures outlined in the Archaeology Branch's 1999 *Found Human Remains* Policy. Seismic Cone (Piezocone) Penetration Tests, where no subsurface materials were recovered, were not monitored.

5.1.3 Mechanical Test Excavations

All subsurface mechanical test investigations in Stages 2, 3, 4a and 4b were conducted under the terms and conditions of *Heritage Conservation Act* Permit 2016-0377, issued November 15, 2016. Stage areas 2, 3, 4a, and 4b were guided by the geophysical results (Golder 2017a). Geophysical images suggested the depths required for excavations to reach various soil/fill interfaces and anomalies, and also suggested the possible nature of the sediments and of some of the anomalies (i.e., potential gravesites).

The grid established by the geophysical team was used as the primary means of locating areas for subsurface inspection. In conjunction with the grid, existing physical features including buildings and fences, were used to place investigation areas onto appropriate base plans. Test pits were excavated in the areas identified, and between one and four anomalies were investigated per test.

An excavator or a backhoe was used to remove the surface and sediments at each test location. The size of each test pit was dependent on the number, size, and depth of the anomaly or anomalies identified within it. The minimum test pit size was 2 m wide by 2 m long, while the maximum was 5.6 m by 3.1 m. Toothed buckets were used to remove pavement, cobbles, and boulders prior to reaching the anticipated cultural layers. Toothless finishing buckets were used to excavate cultural and natural deposits below the sod/asphalt and fill layers. Bucket lifts ranged between 10 cm and 25 cm for all excavated materials. Tests excavated in areas with an asphalt surface (i.e., Stages 2 and 4b) were first marked with paint, then the asphalt was cut with a saw for clean test edges.

Depths of the test pits varied according to the measured depths of the anomalies, observed depth of undisturbed natural soil layers, and presence or absence of observed features in the floor or walls of the tests. Test depths were typically around 1.5 m, to a maximum 2.4 m. At minimum, 25% of culture material-bearing displaced sediments (i.e. historic fill) and interpreted original surface horizon was examined by manual raking for the presence of human remains, faunal material, and historical artifacts (diagnostic[28] artifacts were collected). Excavated material was sorted by type/layer during excavation and was replaced in the order of its excavation when the test was backfilled. In areas with sod (Stages 3 and 4a), the sod was saved and replaced on the top of the test. Compacted road crush was used to top up the tests in areas with paved asphalt surfaces (Stages 2, 4b).

Two teams consisting of two Golder archaeologists and up to two assistants from the Kwantlen First Nation, Kwikwetlem First Nation, Semiahmoo First Nation, or Tsleil-Waututh Nation investigated each test. Observations and interpretations were recorded on forms and in notes. Each test was photographed and a selected wall was profiled. All faunal material and a sample of the diagnostic historic material culture items were collected for laboratory analysis.

5.2 Artifact Analysis

5.2.1 Faunal Remains

The recovered faunal specimens were analyzed to the most specific taxon possible by a zooarchaeologist with access to appropriate reference materials (i.e., France 2009; Gilbert 1990; Gilbert et al. 1996) and a comparative collection. Faunal specimens were described according to taxon, element, side, and any relevant cultural modifications or natural taphonomic processes. These data assist in determining site formation processes.

5.2.2 Historical Materials

The recovered historical materials were analyzed following a basic compositional approach, which includes a description of the material types (i.e., ceramic, glass, metal) and functional categories (i.e., food/beverage, structural, personal/societal) of the recovered items. Appropriate reference materials (i.e., Edwards and Wells 1993; McDonald-Taylor 1993; Polk 2013) were consulted as were comparative objects available in the Golder Archaeology Laboratory.

[28] Diagnostic artifacts are those which are of a specific known type and have enough extant detail to determine through comparative study the original object's use and period of manufacture.

6.0 RESULTS

6.1 Borehole Monitoring (Stages 1, 2, 3, 4a, 4b)

Twenty-three boreholes were drilled between November 14 and 28, 2016 (Figure 10; Appendix A Photos 1, 2 and 3). An archaeologist from Golder monitored 14 of the 23 boreholes in conjunction with the geo- environmental and geotechnical drilling program at NWSS (Figure 10). Details of both the geo-environmental and geotechnical tests at NWSS in 2016 are presented in Golder (2017b, 2017c). The results of the monitoring are presented below in Table 4. Please note that some borehole locations were subject to the installation of geo-environmental monitoring wells (MW) and/or vapour probes (VP) and are referred as such below.

Table 4: Heritage Monitoring Results of Geotechnical Boreholes

Monitored Borehole ID	Location	Results (Historic Artifacts and Human Remains)
MW16-08/VP16-08	Stage 1; Outside of Archaeological Site	Negative
MW16-18	Stage 1; Outside of Archaeological Site	Negative
MW16-01/VP16-01	Stage 1; Outside of Archaeological Site	Historic debris; brick fragments
BH16-19	Stage 2; Within Archaeological Site	Negative
VP16-11	Stage 2; Within Archaeological Site	Negative
MW16-13	Stage 2; Within Archaeological Site	Historic debris; fragment of metal wire.
VP16-23	Stage 2; Within Archaeological Site	Historic debris; metal bracket, clear glass shard.
BH16-04	Stage 3; Within Archaeological Site	Historic debris; metal nail.
BH16-17	Stage 3; Within Archaeological Site	Historic debris; fragment of copper wire.
VP16-05	Stage 3; Within Archaeological Site	Historic debris; clear glass shards, metal nail
MW16-12	Stage 4b; Within Archaeological Site	Negative
VP16-14	Stage 4b; Within Archaeological Site	Historic debris; fragment of clay pipe.
BH16-15	Stage 4b; Within Archaeological Site	Negative
BH16-16	Stage 4b; Within Archaeological Site	Negative

No human remains or materials associated with burials were identified. Historic debris was identified in seven boreholes, but recovered artifacts were determined to have low significance, as they do not meet the criteria established in the British Columbia Archaeological Impact Assessment Guidelines (1998:13, 52).

6.2 Mechanical Test Excavations (Stages 2, 3, 4a, 4b)[29]

Between November 23 and December 13, 2016, 32 mechanical tests were excavated and 62 geophysical anomalies investigated (Figure 10). No evidence of human remains, artifacts associated with cemetery use, or burial features (e.g., grave shafts) were identified in any of the tests (Appendix C, Appendix D). Subsurface anomalies, when identified, have consisted of a range of natural and human-made objects, including boulders, tree stumps and branches, metal objects, construction debris, and a previously paved surface (Appendix E).

[29] Note that test excavations were conducted only within the boundaries of archaeological site DhRr-233, and therefore none were conducted in Stage area 1, which is located entirely outside of the site.

6.2.1 STAGE 2

While there is no historical indication that Stage 2 was used for burials (see Section 4.1.1; Figure 5), the New Isolation Hospital (1912-1938) was located within the area and there is the undocumented possibility that patients who succumbed to disease may have been buried in close proximity to the hospital. After the hospital was torn down, Stage 2 was the site of a boiler house, complete with a deeply buried basement and underground tunnels connecting the boiler house with NWSS structures to the north and south (see Figure 6; Appendix A Photo 4). Subsequent demolitions of school buildings have led to the removal of the boiler house, underground storage tanks, and a section of tunnel are located in Stage 2, although located primarily under the existing portable structures.

The geophysical study revealed numerous anomalies in Stage 2, although none initially suggested the potential to be gravesites (Figure 11). Eighteen subsurface anomalies were selected for possible investigation of which seven were primary anomalies, represented by four strong and three subtle electromagnetic signatures. Interpreted depth of historic fill ranged from approximately 0.4 m DBS (depth below surface) in the south, to approximately 2.2 m DBS near the former location of the boiler house, to 1.5 m DBS in the northern portion of Stage 2. The predicted depth of the anomalies was typically less than 1.5 m DBS, located within the interpreted historic fill.

From November 23 to 24, 2016, four test pits were excavated in Stage 2 to facilitate the investigation of 10 geophysical anomalies (Figure 11). These anomalies consisted of seven primary and three alternate anomalies, of which six were strong and four were subtle (Appendix E). The test excavations were negative for human remains and burial related artifacts and positive for other historic artifacts (Table 5 and Appendix D).

An interpreted original surface deposit was observed below the historic fill within one of the test pits (TS89;157), and consisted of disturbed, dark brown to black silt with trace sand and organics (i.e., rootlets, roots, plant fibres) (Figure 12). The geophysical anomalies were found to be large cobbles or boulders; a burned, fallen tree; metallic historic artifacts or industrial debris; and pieces of construction material (i.e., concrete slab, wire) (Appendix E). Most of the debris was found in the more northern tests while in the south the anomalies are natural (boulders). In general, the anomalies were observed within, or at, the transition from the historic fill to intact natural sediments. Two of the metal objects, an enamel basin (50-60 cm DBS) from TS86;135 and sheet metal debris from TS94;190 (160 cm to 180 cm DBS), coincided with metallic or possible metal signatures (each of which registered as strong EM signatures; Figure 11; Appendix A Photos 5 and 6). A second, strong metallic signature within test pit TS86;135 may coincide with a metal horseshoe (estimated at 60 cm DBS). In test pit TS86;135, the historic fill has been subject to burning as indicated by the fire-reddened silty sand sediment, with pockets of fire-cracked rock, burnt wood, charcoal fragments, and charcoal staining (Figure 8; Appendix A Photo 7).

The stratigraphy typically consisted of two layers of asphalt overlying imported road fill consisting of brown sand with gravel and cobbles. These engineered sediments are underlain by historic fill. The sediment characteristics and quantity of this fill varies substantially across the area, indicating the area has been heavily disturbed by past land-altering activities. Test pit TS89;157 contains a deposit of disturbed basal silt within the historic fill. In test pit TS88;83, the engineered deposits directly overlie sterile basal deposits, with no historic fill. All test pits were terminated in sterile sediment generally consisting of light brown mottled with light grey clayey silt with no indication of burial shafts (Appendix C).

Retained historic artifacts consist of tableware ceramics, an earthenware container, an enamel basin, and a metal mechanical plate (Appendix B). Observed artifacts include structural materials such as fragmented clay drain tile pipe, metal pipe, brick fragments, electrical metal wire, planed wood, sheet metal, concrete slabs; and personal and/or household materials such as leather and glass sherds. A single faunal fragment collected consists of a medium to large Artiodactyl (such as a deer, cow, sheep, goat; Appendix A Photo 8). This taxon would have been present within the area, either as a food resource and/or as a native species.

In general, the historic artifacts collected are consistent with the late 19th century to early 20th century. Some historic artifacts collected from Stage 2 were able to provide additional information. Enamelware, similar to the basin collected from TS86;135, was widely available in North America in the mid-1830's and declined in popularity by the 1950's (Snodgrass 2005). A refitted plate fragment, also collected from TS86;135, features a hand painted "Made in Japan" mark on the base (Appendix A Photo 9). This mark became a requirement for import to the United States (U.S.) in 1921 when the U.S. required that country of origin be included on products in English, however Ross (2009) notes that there is evidence of this mark in North America as early as 1915 due to Japanese export to other countries which already had such laws (Ross 2009). From 1947 to 1952 the mark was changed to include "Occupied" or "Allied" Japan to reflect the Allied occupation of Japan following WW2 (Polk 2013).

Table 5: Stage 2 Results Summary

Test Pit ID	Anomalies	Human Remains	Historic Artifacts		Historic Artifacts Collected
			Historic	Faunal	
TS89;157	3	Negative	Positive	Positive	Yes
TS94;190	2	Negative	Positive	Negative	Yes
TS86;135	3	Negative	Positive	Negative	Yes
TS88;83	2	Negative	Negative	Negative	No

Stage 2 results are consistent with the past land uses of the area, with no indication of use as a burial area. The historical deposits reflect the development of the area with ceramic, glass and metal artifacts (i.e., the dishpan) possibly related to the operation of the isolation hospital, and construction debris related to the building of the school and demolition of the school structure and the hospital. The evidence of burning likely remains from early forest clearing in the area, but some may also be related to the use and demolition of the boiler house.

The industrial and structural materials observed within test pits TS89;157 and TS94;190 are consistent with building materials of the mid-20th century during which NWSS was constructed. The concentration of the industrial/structural materials near the current school footprint also suggests these items are associated with school construction. Within the southern portion of Stage 2, the area was stripped to sterile sediment. It is possible the upper sediments were re-deposited to the north thereby leveling the terrain for the construction of the school, as prior to development the terrain sloped with a general east aspect through the Project Area.

The central area between Stages 2 and 4a could not be accessed for testing due to rough ground and the presence of portable structures. However, given the results of geophysical survey and heritage tests adjacent to this area, it is likely to have been subject to extensive disturbance due to post-cemetery use.

There were no indications in Stage 2 of its use as a burial area.

6.2.2 STAGE 3

Stage 3 consists of the southern part of land leased for the New Chinese cemetery (1909-1914). The area is considered less likely to have been used for burials due to the distance from the road and the indication of a stream channel (which has since been infilled) (Figure10). After the cemetery lease was cancelled, part of the Westminster Regiment Training Barracks (1939-1945) was built in the Stage 3 area (see Figure 6; Appendix A Photo 10).

The geophysical study revealed numerous anomalies, although none initially suggested the potential to be a gravesite (Figure 13). Twenty-nine subsurface anomalies were selected for possible investigation of which 13 were primary anomalies, represented by four strong and nine subtle electromagnetic signatures. Interpreted depth of historic fill ranged from approximately 1.4 m to 2.0 m DBS. The predicted depth of the anomalies ranged from approximately 0.5 to 2.0 m DBS, averaging at 1.5 m DBS, within the interpreted historic fill.

From November 25 to 30, 2016, seven test pits were excavated to facilitate the investigation of 14 geophysical anomalies (Figure 13). These anomalies consisted of 13 primary anomalies and one alternate anomaly, of which five were strong and nine were subtle (Appendix E). Deeply disturbed areas were observed close to the school in the west of Stage 3 (see Figure 8). The upper layers were remarkably regular in the playing field, with some signatures related to drainage and irrigation pipes. The test excavations were negative for human remains and positive for non-burial related historic artifacts (Table 6 and Appendix E).

Within four of the test pits (TN20;-100, TN32;-64, TN41;-80, and TN30;-43), a possible original surface deposit was observed below the historic fill, consisting generally of thin layer of dark brown silty sand to sandy silt with organics (Figure 14; Appendix A Photo 11). The feature interpreted as a “channel” in the geophysical record appears to have been and still is a water feature, as rapid water ingress was observed in test pits TN28;-106, TN20;-100, and TN41;-80 (see Figure 8). The GPR also detected a series of drainage pipes within clean fill, spaced approximately 6.0 m apart in an east to west direction (Figure 9). These pipes and several other PVC pipes observed during excavation (0.5 to 0.9 cm DBS) are associated with drainage for the current soccer field. Other geophysical anomalies included a layer or concentration of cobbles, boulders, industrial materials (i.e., sheet metal, rebar, planed wood, modern nail), a fallen tree, modern drainage infrastructure, or deeply buried historic infrastructure (i.e., wood-stave pipe) (Appendix F). In general, the anomalies were observed within the historic fill, with the exception of test pit TN41;-80 where the anomaly was observed within the disturbed, interpreted original surface deposit.

TN-14;-105 was the one test location in pavement, near the school (Appendix A Photo 12). Stratigraphy under the playing field was consistently sod overlying imported, clean brown sand fill to a depth of about 60 cm below surface. The engineered sediments are typically underlain by two layers of historic fill. The sediment characteristics and quantity of this fill varies substantially across the area, indicating the area has been heavily disturbed by past land-altering activities. Test pits TN32;-64, TN41;-80, TN30;-43, and TN-14;-105 contain pockets of disturbed basal silt within the historic fill. All test pits were terminated in sterile, natural sediment generally consisting of light brown mottled with light grey clayey silt with no indication of burial shafts (Appendix C).

Retained historic artifacts consist of tableware ceramics, earthenware containers, cosmetic/drug bottles and jars, beverage bottles, food jars, tin can, structural materials such as nails, a nut and bolt, an insulator, window pane glass, tile, a sconce fragment, planed wood, as well as a shoe sole and leather (Appendix D). Other historic materials that were observed include brick and metal fragments, fragments of clay drain tile pipe, glass and ceramics sherds, metal pipe, wood-stave pipe, metal wire, planed wood, glazed clay sewer pipe fragments, PVC pipe fragments, and a marble (Appendix A Photo 13).

Several faunal elements and fragments were collected and consist of medium to large Mammalia, medium to large Artiodactyla, and Saxidomus gigantea (butter clam) taxon (See Appendix A Photo 8). Four of the elements have saw cut marks consistent with butchery practices and two of the fragments are calcined (Appendix A Photo 14).

In general, the historic artifacts which were collected are consistent with the late 19th century to early 20th century. A number of ceramic, glass, and metal artifacts featuring distinguishing marks were recovered from Stage 3. A selection of these artifacts where additional information could be determined are described below.

Several fragments of ceramic tableware featuring maker's marks were collected from test pit TN-14;-105, notably a "JOHNSON BROS ENGLAND" maker's mark on the base of a teacup; a "BOOTHS" "SILICONE" "EN" maker's mark on a ceramic fragment; and a laurel wreath surrounding an "M" above the words "Made In Japan" maker's mark on a plate base fragment (Appendix A Photo 15). The teacup fragment can be attributed to Johnson Bros Ltd. of Hanley, Staffordshire, UK, who were established in 1883. The particular mark in question first appears in 1900 (Lang 1995). The BOOTHS fragment can is attributed to Booth's Ltd. of Tunstall, Staffordshire, UK. This mark first appears in 1906 (MacDonald-Taylor 1962). The plate fragment contains the family symbol of the Morimura family, founders of the Noritake company, established in 1904 (Noritake 2017). It was not until 1914 that the company began to export porcelain plates. As noted in Stage 2, the presence of the "Made in Japan" mark became a requirement for U.S. import in 1921 until 1947 when "Occupied" or "Allied" appeared (Ross 2009; Polk 2013).

An "Orange Crush 6 FL OZ" clear glass bottle reading "Rec'd Aug 22, 1921" with the Dominion Glass Company symbol on the base was collected from test pit TN30;-43 (Appendix A Photo16). This bottle was found *in situ* at a depth of 150 cm. This type of "Crush" bottle was manufactured between 1921 and the early 1940s, however production continued through to the 1960's. The presence of the Diamond-D symbol accompanied by no other distinguishing marks narrows the production range from 1921 to 1928 (Lockhart et al. n.d.). Several brown glass bottle base fragments were collected with variations of "Made In Canada" and the Dominion Glass Company trademark, one of which was manufactured in Redcliff, Alberta in 1944 (Miller and Jorgensen 1986; Appendix A Photo 17). The trademark dates the fragments between 1940 and 1953 (Miller and Jorgensen 1986).

A clear glass jar base reading "KERR GLASS MFC CO" "PAT JUNE 9 1903" "SAND SPRINGS OKLA" was collected from TN8;-12. The Kerr Glass Manufacturing Company opened its Sand Springs Oklahoma factory in approximately 1914, marking the earliest date of manufacture for this piece (Landis 1999; See Appendix A Photo 17). Several pharmacological bottles were also collected from Stage 3, including a white Mentholatum Jar dated between approximately 1895 and 1955 (Polk 2013; Appendix A Photo 18). Fragments of a clear octagonal Heinz bottle reading "H.J. Heinz CO" and "132 PAT" on the base were recovered from TN-14;-105 (See Appendix A Photo 17). This bottle type was manufactured from 1918 to 1933 and contained different varieties of Heinz pickles, including Chow, Sour Mixed, and Sweet Gherkins (Society for Historical Archaeology 2006).

Several nails were collected from test pits TN-14;-105, TN32;-64, and TN41;-80 (Appendix A Photo 19). They are consistent with modern wire drawn types described as Stage 11 and 12 by Edwards and Wells (1993). These nail types range in production from 1870 to present (Edwards and Wells 1993). Along with the nails, a "Puritan Meatballs in Gravy" tin can was recovered from TN-14;-105 (Appendix A Photo 20).

Table 6: Stage 3 Results Summary

Test Pit ID	Anomalies	Human Remains	Historic Artifacts		Historic Artifacts Collected
			Historic	Faunal	
TN8; -112	2	Negative	Positive	Negative	Yes
TN20; -100	3	Negative	Positive	Positive	Yes
TN32; -64	2	Negative	Positive	Negative	Yes
TN28; -106	2	Negative	Positive	Positive	Yes
TN41; -80	1	Negative	Positive	Positive	Yes
TN30;-43	2	Negative	Positive	Negative	Yes
TN-14;-105	2	Negative	Positive	Positive	Yes

Stage 3 contains the highest density of historic artifacts of the investigation area. Density is greatest adjacent to the school and declines to the east. The types and dates of artifacts in Stage 3 do not indicate its use as a burial area, however they are consistent with use of the land for the Westminster Regiment Training Barracks, 1939-1945, (i.e., Heinz bottle, Noritake company plate fragment, and Orange Crush bottle), as well as later school construction.

Stage 3 also contains the highest concentration of faunal material found within the Project Area. The faunal material were collected from test pits TN20;-100, TN28;-106, TN41;-80, and TN14;-105. These remains display features consistent with butchery practices and food preparation. It is possible the increase in historic materials and faunal remains is related to with a refuse deposit associated with the training barracks. The materials and remains are concentrated near the “back” (away from central corridor) of the barracks, where a pattern of discard might be expected.

The industrial and structural materials observed within test pit TN-14;-105 are consistent with building materials of the mid-20th century during which NWSS was constructed (Appendix A Photo 21). As with Stage 2, the concentration of the industrial/structural materials near the current school footprint suggests these items are associated with the school construction. Figure 8 illustrates the formerly excavated area located adjacent to the existing school which was subsequently filled with soil, construction debris and artifacts. A wire bound stave-wood pipe was also observed in TN -14;-105 at 127 cm DBS, suggesting that this area was also disturbed by some infrastructure that was likely placed prior to the construction of NWSS (See Appendix A Photo 12).

The possible buried stream channel identified during the geophysical survey in the south and east portions of Stage 3 (see Figures 8 and 10) was confirmed to be such due to the significant amount of water ingress in test pits situated within and around the channel margins (TN28;-106, TN20;-100 and TN41;-80).

There were no indications in Stage 3 of its use as a burial area.

6.2.3 STAGE 4a

Stage 4a is also located within a portion of land leased as part of the New Chinese cemetery (1909-1914); and, based on its proximity to the road, it is considered to have greater potential for containing gravesites than Stage 3 (Figure 6). However, this area was also built over with the Westminster Regiment Training Barracks (1939 to 1945) and is now also occupied by a playing field (Appendix A Photo 22).

Several geophysical anomalies with characteristics consistent with gravesites were identified in this area (Figure 9). Twenty-five subsurface anomalies were selected for possible investigation of which 13 were primary anomalies, represented by six strong and two subtle electromagnetic signatures and six possible gravesite signatures. Interpreted depth of historic fill ranged from approximately 0.5 m to 2 m BS. The interpreted depth of the anomalies ranged from 0.8 m to 3.0 m DBS, averaging at 2.0 m DBS, near the bottom of fill or down to approximately 1.5 m into sterile soil.

From November 30 to December 5, 2016, seven test pits were excavated to facilitate the investigation of 14 geophysical anomalies. These anomalies consisted of 13 primary anomalies and one alternate anomaly, of which six were strong and two were subtle, and six were possible gravesite signatures (Appendix E). The test excavations were negative for human remains and burial-related artifacts and positive for other historic artifacts (Table 7 and Appendix D).

Geophysical anomalies in Stage 3 were predicted at depths within the interpreted historic fill (0.5 m to 2.0 m DBS) while in Stage 4a the predicted anomaly depth was within the interpreted sterile sediments (2.0 m to 3.0 m DBS). The sterile sediment exposed in the deeply buried Stage 4a tests contained no evidence of disturbance or grave shafts. Occasionally excavations were abandoned before the estimated depths of the anomalies were reached when sterile sediments were exposed with no sign of disturbance evident in the floor of the test pit. The unexamined anomalies can likely be attributed to large cobbles or boulders located within the undisturbed sterile sediments.

Within four of the test pits (TN36;-12, TN19;-34, TN31;-15, and TN13;-4), a possible original surface deposit was observed situated below the historic fill and consisting generally of a thin layer of dark brown sandy silt with organics (Appendix A Photo 23). Within test pit TN27;-4, a feature with a level reflective upper surface, thought possibly to be a structure, was found to be a thin layer of asphalt and associated road fill (1.3 m DBS), located below the first deposit of historic fill (Figures 9 and 17). The geophysical anomalies were typically found to be large cobbles, boulders, or PVC irrigation and drainage pipes associated with the current soccer field (Appendix A Photos 23 and 24). Several anomalies were not identified during excavation and it is possible, based on their predicted depth, the anomalies may be cobbles or boulder embedded in the undisturbed sterile sediments (Appendix E). The remaining anomalies consisted of a deeply buried water main and metal pipe fragment. The anomalies were typically observed within the historic fill and in rare instances in the imported fill (“clean” or homogenous, engineered fill, typically devoid of artifacts) or within the disturbed, interpreted original surface, near the interface with the historic fill. Three of the metal objects from TN31;-15, a sprinkler head (10 cm to 53 cm DBS), two wires (78 cm to 78.5 cm DBS), and a metal pipe fragment (1.16 m to 1.19 m DBS), coincided with metallic signatures (each of which registered as strong EM signatures). Two metallic signatures within test pit TN26;-8 may coincide with one historic nail and one modern metal nail (estimated at 28 cm DBS) and an enamel mug (estimated at 58 cm to 100 cm DBS) (Figure 16).

Stratigraphy consisted of sod overlaying imported, clean brown sand fill. The engineered sediments are underlain generally by two distinct layers of historic fill. The sediment characteristics and quantity of this fill varies substantially across the area, indicating the area has been heavily disturbed by past land-altering activities. Test pits TN32;-64, TN41;-80, TN30;-43, and TN-14;-105 contain pockets of disturbed sterile sediment within the historic fill. All test pits were terminated in undisturbed sterile sediment generally consisting of light brown mottled with orange silty sand, with no indication of burial shafts (Appendix C).

Collected historic artifacts include tableware ceramics, cosmetic/drug bottles, beverage bottles, food jars, and structural materials such as a metal pipe and plug, nails, window pane glass, and planed wood (Appendix A Photo 25). Observed historic materials consisted of brick and metal fragments, fragments of clay drain tile pipe, glass and ceramic sherds, and PVC pipe fragments.

In general, the collected historic artifacts are consistent with the late 19th century to early 20th century. A clear glass bottle fragment consisting of a complete base bearing the Dominion Glass Diamond-D trademark as well as "United Distiller Limited F" "Vancouver Canada" and "6" was collected from TN26;-8 (See Appendix A Photo 17). This bottle was manufactured by the Dominion Glass Company factory in Redcliff Alberta, in November or December of 1950 (Miller and Jorgensen 1986). Several other clear glass bottle base fragments were collected from Stage 4a with variations of "Made In Canada" and the Dominion Glass Company Diamond-D trademark (See Appendix A Photo 17). These bottles were manufactured in Redcliff Alberta in January or February 1942 or 1952; Bramalea, Ontario post-1960; and Point St. Charles, Montreal in November or December 1943 or 1953 (Miller and Jorgensen 1986). Also recovered from TN26;-8 was an enamel tin mug understood to be typical of the Second World War, but also previous eras of British (and Canadian) army issue (see Appendix A Photo 6).

Table 7: Stage 4a Results Summary

Test Pit ID	Anomalies	Human Remains	Historic Artifacts		Historic Artifacts Collected
			Historic	Faunal	
TN19;-34	2	Negative	Positive	Negative	Yes
TN5;-19	1	Negative	Positive	Negative	No
TN31;-15	4	Negative	Positive	Negative	Yes
TN26;-8	2	Negative	Positive	Negative	Yes
TN36;-12	2	Negative	Positive	Negative	Yes
TN27;-4	1	Negative	Positive	Negative	Yes
TN13;-4	2	Negative	Positive	Negative	No

Stage 4a results are consistent with the more recent land use of the area, reflecting the development of the area from the Westminster Regiment Training Barracks (1939 to 1945) to the present. Stage 4a differs from Stage 3 in that much fewer historic artifacts were observed or collected; however those that were (i.e., enamel mug, glass bottles) are consistent with items which would have been utilized at the Westminster Regiment Training Barracks from 1939 to 1945. In test pit TN27;-4, the thin layer of buried asphalt and associated road fill is located at the approximate entrance to the training barracks, and could conceivably be the remains of the original sidewalk. No faunal material was observed.

There is a generally higher representation of structural/industrial and infrastructure materials in proximity to Tenth Avenue. This is to be expected adjacent to a longstanding transportation and utilities corridor.

There were no indications in Stage 4a of its use as a burial area.

6.2.4 STAGE 4b

Parts of the Stage 4b area may be associated with the Old Chinese Cemetery and Potter's Field (ca. 1892 to ca.1908) and is considered to have a higher potential to contain gravesites (Figure 18). After cemetery use ended, this area was used as part of the City of New Westminster's Works Yard and Stable (1915 to 1948) followed by the construction of the school (Appendix A Photo 26).

Several geophysical anomalies with characteristics consistent with gravesites were identified. Fifty-one subsurface anomalies were selected for possible investigation, of which 23 were primary anomalies, represented by 24 strong and 16 subtle electromagnetic signatures, and 11 possible gravesite signatures. Interpreted depth of historic fill generally ranged from approximately 0.2 to 1.5 m DBS. The interpreted depth of the anomalies ranged from 0.5 m to 1.7 m DBS, averaging at 1.2 m DBS, generally within the interpreted historic fill.

From December 7 to 13, 2016, 14 test pits were excavated to facilitate the investigation of 24 geophysical anomalies. These anomalies consisted of 22 primary anomalies and one alternate anomaly, of which 12 were strong and four were subtle, and seven were possible gravesite signatures (Appendix E). The test excavations were negative for human remains and positive for non-burial related historic artifacts (Table 8 and Appendix D).

An interpreted original surface deposit was observed below the historic fill within one of the test pits (TS22;6), consisting of disturbed, dark brown sandy silt mottled with blue/grey clayey silt (glacial sediment). Where the geophysical anomalies could be identified, they were typically large cobbles or boulders located within the undisturbed natural sediments. In test pit TS7;11, a metal fragment recovered from the historic fill corresponded with the anomaly (see Figure 9). Test pits TS42;102 and TS31;47 were terminated at a clay drain tile pipe set in drain rock and a glazed clay sewer pipe respectively, both of which corresponded with the geophysical anomalies (Appendix A Photo 27).

Stratigraphy generally consisted of two layers of asphalt overlying imported road fill consisting of brown sand with gravels and cobbles. In general, the sediment characteristics and quantity of the fill layers in Stage 4b are more consistent than observed in other Stages. The basal sediments are relatively shallow and overlain by relatively thin layers of historic fill, and clean, (recent) imported fills without artifacts. The stratigraphy suggests that much of the original soil in the area was stripped away during past land disturbances. However, in the southwest portion (TS22;6, TS7;11, and TS8;25), the historical fill is generally deeper and more variable nature, suggesting less of the original material has been stripped away in this area (See Figure 19; Appendix A Photo 28). The tests were typically terminated in sterile sediment generally consisting of two layers, a mottled light brown and light grey clayey silt overlaying medium grey silty sand, with no indication of burial shafts (Appendix D; Appendix A Photo 29).

Collected historic artifacts include tableware ceramics and glass (see Appendix A Photo 9). Observed historic materials consist of brick and metal fragments, fragments of clay drain tile pipe, glazed clay sewer pipe, glass sherds, and PVC pipe fragments. The tests in Stage 4b generally revealed sterile sediments near the surface, or contained clean engineered fill, as such the historic artifacts collected and observed were minimal.

Table 8: Stage 4b Results Summary

Test Pit ID	Anomalies	Human Remains	Historic Artifacts		Historic Artifacts Collected
			Historic	Faunal	
TS22;156	1	Negative	Negative	Negative	No
TS27;147	1	Negative	Negative	Negative	No
TS79;46	1	Negative	Negative	Negative	No
TS85;66	1	Negative	Positive	Negative	No
TS42;102	2	Negative	Negative	Negative	No
TS79;52	2	Negative	Negative	Negative	No
TS22;6	2	Negative	Positive	Negative	Yes
TS51;31	2	Negative	Positive	Negative	No
TS7;11	2	Negative	Positive	Negative	Yes
TS85;34	1	Negative	Negative	Negative	No
TS31;47	2	Negative	Positive	Negative	No
TS68;44	2	Negative	Negative	Negative	No
TS8;25	2	Negative	Positive	Negative	Yes
TS30;30	2	Negative	Negative	Negative	No

Stage 4b results are consistent with the more recent land use of the area, with no indication of use as a burial area. The southeast and northwest portions of Stage 4b have been stripped to sterile sediment. As noted within Stage 2, it is possible the upper sediments were re-deposited to the east and northeast, thereby leveling the terrain for construction of the school, as prior to development the terrain sloped with a general eastward aspect through the Project Area. The minimal number of historic artifacts collected or observed is consistent with the levelling and stripping of the terrain prior to school construction and possibly prior to construction of the works yard as well. The subsurface infrastructure observed within tests pits TS42;102 and TS31;47 is consistent with mid-20th century building materials, concurrent with the construction of the school and the removal of the existing water and sewer services by the City of New Westminster prior to school construction.

As noted previously, historical fill depths in Stage 4b are greatest in the southwest corner. The extent of the disturbance is similar what was observed in Stages 2 and 3 where subsurface deposits were heavily altered by past land-altering activities, within the assumed construction footprint of the existing buildings.

There were no indications in Stage 4b of its use as a burial area.

7.0 DISCUSSION

No gravesites or burial-related features were located, and no other evidence of historic cemetery use was observed within the Project Area as a result of field investigations. No human remains were observed in the raked sediments, and no grave-related goods were identified among the artifacts observed. In the following section, these results are discussed from the perspective of the overall heritage investigation program, and also discussed are possible interpretations of the results with respect to previous impacts to the historically identified cemetery areas.

7.1 Results of Ground-Truthing

A preliminary sampling plan had been established with a base number of geophysical anomalies to be ground-truthed (see section 5.1.1.1). The number of anomalies actually investigated was 62, or over twice the number (30) initially set out (see Appendix E). Of the 38 anomalies identified as potential gravesites, 15 (39%, and three times the sample number originally specified) were finally ground-truthed. The six potential gravesites examined in Stage 4a proved to be either infrastructure (buried PVC pipe) or were buried below test depths in undisturbed ground (likely boulders). All of the potential gravesites investigated in Stage 4b proved to be of natural origin, boulders or cobbles, or located below the test base in undisturbed deposits.

The remaining 47 anomalies investigated represent a wide range of anomaly types, including isolated, “paired”, and grouped anomalies. Metallic signatures were found to reflect both small metal objects near the surface and larger ones at depth, and so were perceived as a useful potential (if unproven) indicator of casket hardware, if present. However, some emphasis was placed on the selection of subtle anomalies as these might reflect simpler burials or the grave shafts of exhumed burials, particularly as might be associated with burials of the Chinese community and those located in the Potter’s Field. Eighteen subtle anomalies were investigated in all. The ground-truthed results of subtle anomalies were also a combination of natural and cultural features, not noticeably different than those of the strong anomalies.

Anomalies were also examined in a variety of background conditions. The interpretations of the larger features such as debris-filled pockets, a stream channel, and infrastructure like the PVC drain tile laid in drain rock, were proven to be correct through ground-truthing (see Figures 8 and 9). The interface depths observed in geophysical data were found to represent actual interfaces, although it was sometimes clear only upon examination which adjoining layers were engineered fill, historical fill, and basal sediment.

7.2 Results of Sediment Examination

During the heritage test program, approximately 178 m^3 of excavated sediments from the 32 tests were examined, with about 28% of these sediments being raked through. Virtually all of this raked material was interpreted as disturbed fill, probably turned over and redistributed from proximal locations during historical levelling or landscaping during land clearing, ground preparation for construction and other land use, and demolition. Artifacts observed in the historical fill, where datable, typically dated to the early to mid-20th century, thereby generally corresponding with the various land uses which followed cemetery use in the area. These artifacts were also found at nearly the full range of historical fill depths, underscoring the suspected degree of disturbance related to post-cemetery development activities. Given the disturbance observable in the Project Area, and the disturbance both

documented and presumed to have occurred within parts of the designated cemetery area, it is noteable that no human remains, consistent with the disturbance of gravesites historically (i.e., bone fragments located within disturbed sediments), were observed during field investigations.

Few undisturbed sediments, or original surfaces and related organics (limited to thin layers in a few tests in Stages 2, 3 and 4a) were observed. Some areas, most noticeably in Stage 4b, lacked historical fill, with recent engineered or imported fills directly overlaying shallow glacial deposits, suggesting these areas had been stripped or had otherwise been subject to a considerable loss of sediments during levelling and/or demolition activities. A single historic reference suggests that excavated material from the school foundation footprint was redistributed to the southwest into the grassy areas now located near the corner of Eighth Street and Eighth Avenue[30]; otherwise the most likely route for redistribution would be downslope, which, based on historic and modern contours, trends to the east and north.

There are also areas with deeper deposits of historical fill identified in Stages 2 and 3. These appear to be a combination of natural (water channel) and construction related depressions, subsequently filled with sediments and debris (see Figure 10). These areas have proven to be rich in historical artifacts, because of the debris included when they were filled, however, the greatest density of artifacts appears to be located adjacent to the school buildings.

The basal sediments are glacial or sterile deposits that tend to be light grey or light brown sandy silts, and often very compact (hard-pan), in contrast to the less consolidated and darker sediments located above. As a result, once the bucket of the excavator had cleaned bottom of the unit in the basal material, it could be determined whether or not any historical excavations (e.g., grave shafts) had extended below the level being examined.

7.3 New Westminster Public Cemetery (1891 – 1907)

The New Westminster Public Cemetery, based on survey information from 1914, was located entirely within the designated cemetery area and outside the Project Area (see section 4.1.1.1). Two tests on two anomalies, including one potential gravesite and one subtle anomaly, were placed in Stage 4b near the boundary between sites DhRr-233 and DhRr-401, against the possibility of an error in the interpreted boundary line, and also the possibility that graves may have been placed just “outside” the fence. No historical material was located in either of these tests (TS22;156 and TS27;147) as the road fill lay directly over sterile deposits.

As the impacts of existing NWSS school construction extended to greater depth than the adjacent ground tests, it is almost certain that the portion of the New Westminster Public Cemetery located beneath the school footprint, including in the adjacent areas excavated for the foundations has been destroyed. Much of the material from this area would have been redistributed at the site, and there remains the possibility some of this material, including human remains, was redistributed to the north and northeast of the permanent school structure and into the Project Area. However, there was no evidence of cemetery-related sediments observed in the test pit sediments, and relatively little historical fill was observed at all in much of Stage 4b and the southern part of Stage 2 closest to the documented location of the New Westminster Public Cemetery.

[30] City contract to Mr. Evans for Reclearing of the site for proposed new school buildings at Eighth and Eighth Avenue, New Westminster, BC. Dated February 11, 1948

7.4 'Old' Chinese Cemetery (1892 – 1907)

The Old Chinese Cemetery is the least well located of the historical cemeteries (see section 4.1.1.2). Test results in most of Stage 4b, not only found no gravesites but suggest that any which may have been located in the area would have been destroyed by subsequent land use. Likewise, no sign of burials and extensive impacts from subsequent land use were recorded in Stage 2. Although not observed during excavations there remains the possibility some displaced cemetery material, including human remains that may not have been properly exhumed, was redistributed into the historical fill located in Stages 3 and 4b.

No insight to the historical location of the Old Chinese Cemetery has been gained from these investigations, however, it appears that any of the cemetery gravesites which may remain would likely be located outside the existing school construction footprint near Eighth Street.

7.5 Potter's Field (ca. 1892 – ca. 1907)

Stage 4b closely corresponds with the eastern and northern mapped limits of the Potter's Field (see section 4.1.1.3). As stated above, test results in most of Stage 4b, not only found no gravesites but suggest that any which may have been located in the area would have been destroyed by subsequent land use. Similar results were recorded in the adjacent Stage 2. Given the shallow depths of basal deposits, the construction of existing structures, including the NWSS and the Massey Theatre would likely have led to the destruction of any gravesites located there. Although not observed during the heritage tests, the possibility persists that some displaced material from the Potter's Field, including human remains, has been redistributed with the historical fill located in Stages 3 and 4b.

No insight to the historical extent of the Potter's Field has been gained from these investigations, however, it is likely, if any of the cemetery gravesites survive, that they would be located outside the school and theatre construction footprints near Eighth Street or Eighth Avenue.

7.6 Douglas Cemetery (1907 – ca. 1920)

The Douglas Cemetery was carefully mapped with gravesites plotted. There is little reason to expect that any associated gravesites were located outside of its mapped boundary or in the Project Area. It is possible, as a result of land levelling and landscaping activities associated with construction of the barracks and the school, that some displaced material from the Douglas Cemetery, potentially including human remains, has been redistributed with the historical fill located in Stages 3 and 4a, although none was observed during investigations.

It appears possible as well, given the absence of evidence for gravesites in Stage 4a, that members of the Chinese community may have been interred within the boundaries of the Douglas Cemetery during its operation. Although this would place them outside the Project Area, historical gravesite destruction there might have led to redistribution of these grave contents as well into Stages 3 and 4a.

7.7 The 'New' Chinese Cemetery 1909 – 1914

The historical fill observed throughout Stages 3 and 4a suggest considerable post-cemetery land modification within the leased boundaries of the New Chinese Cemetery, but not the general removal of material into basal sediment levels as was observed in Stages 2 and 4b. If gravesites had been present in the area, investigations would likely have revealed them. Furthermore, geophysical evidence supported by field results suggests that much of Stage 3 was probably unsuitable for burial use due to the presence of a water channel. No evidence of cemetery use was observed in Stages 3 or 4a, however, the possibility persists that the historical fill in the area may contain material, including human remains, displaced from the Douglas Cemetery area.

The absence of evidence for burials in the New Chinese Cemetery area (Stages 3 and 4a) is not entirely unexpected. Although the 1914 survey of the cemetery by Burnett and McGugan shows that the Chinese Cemetery was cleared and fenced to its leased extent, and the Burnaby residents' complaints suggest its use, the extent of its use is unknown (see section 4.1.1.5; Golder 2008:26). The report in the press after the order to revoke the cemetery lease in 1914, that "the Chinese Association had spent $1,000 in improving this property, and so far there have been no burials in it…" [31], is the narrative that seems to be supported by the results of field investigations.

[31] *The British Columbian*, November 16, 1914, p. 5 "Protests to City Council".

8.0 IMPACT EVALUATION

No previously unknown archaeological sites, human remains or historic materials and features associated with cemetery use were identified during the archaeological impact assessment of the Project Area. As such, no impacts to HCA-protected archaeological site DhRr-233 are anticipated as a result of the proposed school replacement activities within the Project Area.

9.0 IMPACT MANAGEMENT RECOMMENDATIONS

Given that the heritage investigation program did not identify any human remains or historic materials and features associated with cemetery use, no further archaeological investigations are recommended prior to development of the replacement school, provided that development impacts do not extend into areas of DhRr-233 that have not been assessed.

Records indicate there have been extensive impacts to the cemetery areas known to have formerly existed within or adjacent to the Project Area. The extent of some of these impacts is also evident in the archaeological record. As a result, despite the negative results of investigations, Golder recommends implementing the following heritage management recommendations over the duration of the school replacement project.

Chance Find Management

To address the potential of finding intact or fragmentary human remains or burial-related historical material during construction, Golder recommends the development and implementation of a Chance Find Management Procedure for use by SD40. The objectives of this Procedure include the preservation and proper management of heritage resources that are unexpectedly encountered during school replacement activities. This will also minimize disruption to construction activities and scheduling. The document will include both general guidelines and detailed steps to follow for the appropriate response to the discovery of known or suspected archaeological materials, including human remains or grave goods, during the course of school replacement activities. In addition to providing instructions for construction crews, it will include a list of important contacts and telephone numbers for reference.

Heritage Conservation Act Permitting

To address the potential for encountering fragmentary human remains and to allow for archaeological monitoring, a valid HCA permit (either S.12 or S.14) should be in place during construction. Following advice from the Archaeology Branch, an amendment to the current HCA permit would likely allow for the timely implementation of appropriate resource management procedures in the event that such remains are encountered anywhere in the Project Area.

Archaeological Monitoring

As an added precaution, archaeological monitoring by a qualified archaeologist is recommended under terms of the HCA permit during construction-related activities that result in subsurface disturbance. Based on the negative results of the AIA, monitoring would not be required at all times and all areas during these activities, but may be implemented on occasion according to development plans, and through on-going discussions with the Archaeology Branch and SD40 when and where potentially more sensitive areas are being impacted. These potentially more sensitive areas may be determined and mapped as part of the discussion process.

Revisit Archaeological Site Boundary

At the conclusion of the Project, when all the archaeological results are available, (including from monitoring and possible chance finds during construction), the boundary of site DhRr-233 should be reviewed taking into account the areas where any cemetery-related material may have been found archaeologically and those untested areas with potential for the presence of burials.

10.0 STUDY LIMITATIONS

Even the most thorough inspection may fail to reveal the presence of archaeological and heritage materials, including those protected by the *Heritage Conservation Act*. Therefore, consistent with the intent of the HCA, SD40 is advised that if any unanticipated cultural materials or features including, but not limited to archaeological and historic objects, human remains and/or cemetery or burial features, are encountered, prior to, or during school replacement activities, all land altering work in the immediate vicinity should cease. The Archaeology Branch, interested stakeholder communities, and a qualified archaeologist should be contacted as soon as possible.

11.0 CLOSURE

This interim report was prepared solely for School District No. 40 (New Westminster) and the Archaeology Branch, in partial fulfillment of the terms and conditions of HCA Permit 2016-0377. Any use, reliance, or decisions made by third parties on the basis of this report are the responsibility of such third parties.

We trust the information in this report is sufficient for your present needs. Should you have any questions regarding the heritage services for this Project, please do not hesitate to contact the undersigned.

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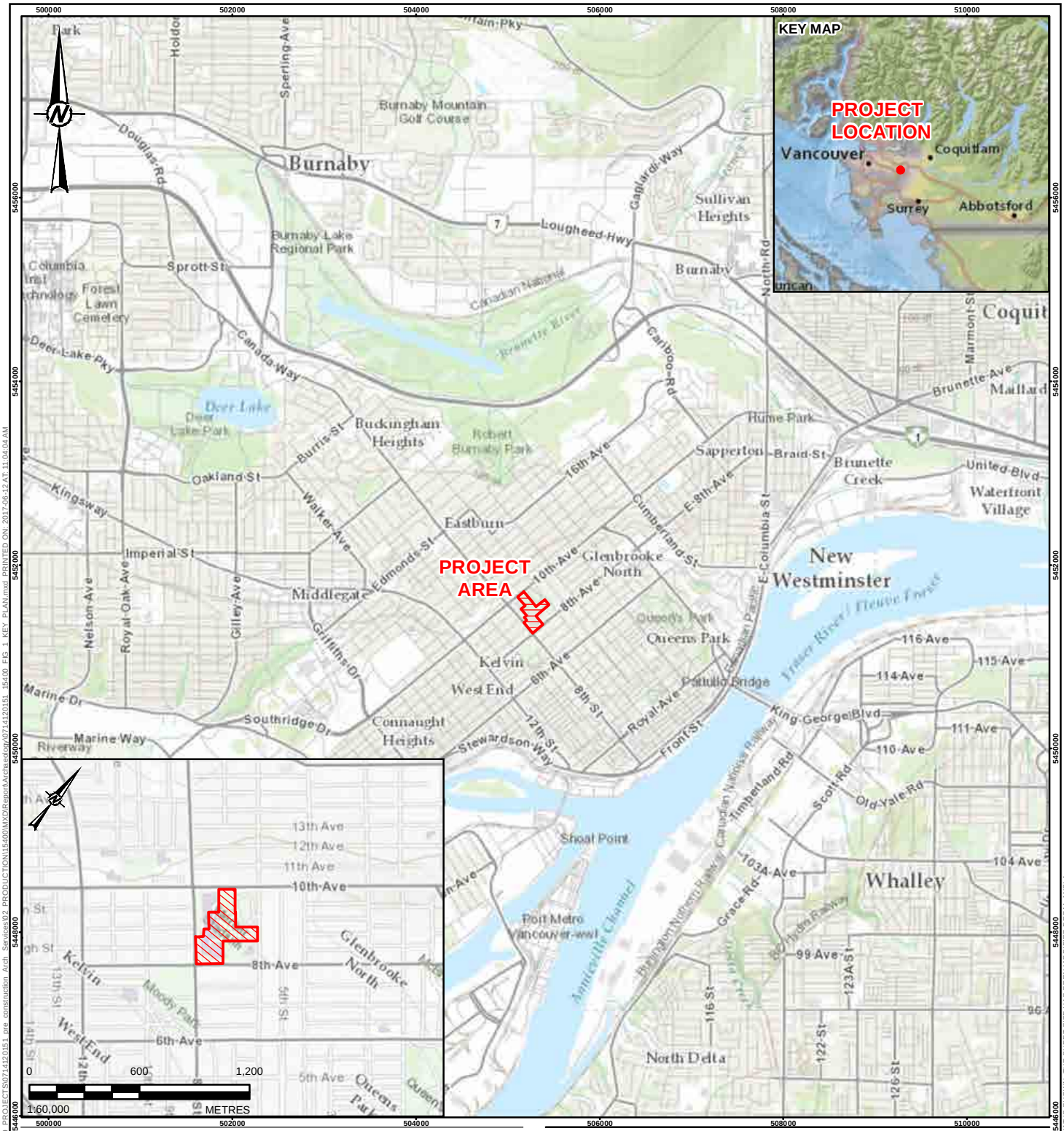

LEGEND

- PROJECT AREA
- MAJOR ROAD
- LOCAL ROAD

REFERENCE(S)

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DATUM: NAD 83 PROJECTION: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
KEY PLAN

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-16
DESIGNED	CM
PREPARED	MH
REVIEWED	CRM
APPROVED	ARM

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LEGEND

- ARCHAEOLOGICAL SITE
- HISTORIC SITE
- DEDICATED CEMETERY (CIFSA)
- PROJECT AREA

BASE DATA

- LOCAL ROAD
- LOCAL STREET
- PRIMARY HIGHWAY
- PARCEL

0 40 80

1:1,600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DHRR-233 AND HISTORIC PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2016/09/16).
2. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
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PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
PROJECT AREA

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-25
DESIGNED	MR
PREPARED	MH
REVIEWED	CRM
APPROVED	ARM

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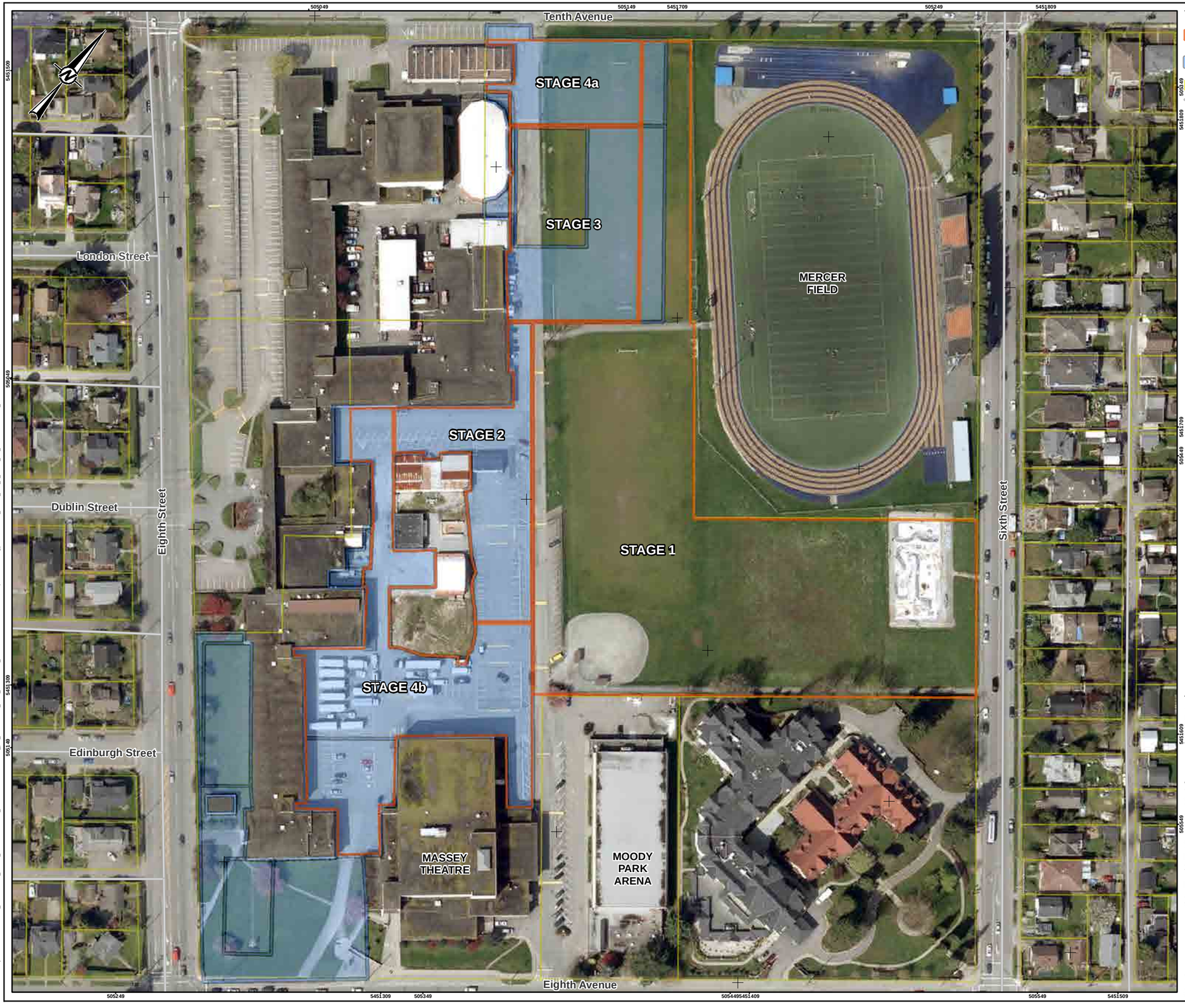

LEGEND

- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS
- GEOPHYSICAL SURVEY AREAS (JULY 13 - AUGUST 23, 2016), WHERE ELECTROMAGNETIC (EM) AND/OR GROUND PENETRATING RADAR (GPR) DATA WAS COLLECTED
- CADASTRAL BOUNDARY
- ROAD

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1:1,600 METRES

REFERENCES

1. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
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SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
PLAN OF INVESTIGATION AREAS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-16
DESIGNED	MR
PREPARED	MH/SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\New_Westminster_School_District\NWS\99_PROJECTS\0714120151_pre_construction_Arch_Services\02_PRODUCTION\15400\MXD\ReportArchaeology\0714120151_15400_FIG_3_PLAN_OF_INVESTIGATION_AREAS.mxd PRINTED ON: 2017-06-12 AT: 11:21:33 AM

89H6030

89H6032

Tenth Avenue

Eighth Avenue

London Street

Dublin Street

Edinburgh Street

Eighth Street

Sixth Street

SOURCE:
A.W. GRAY, MAYOR OF NEW WESTMINSTER, FEBRUARY 5, 1913.

SOURCE:
LEASE AGREEMENT BETWEEN CITY OF NEW WESTMINSTER AND THE CHINESE BENEVOLENT ASSOCIATION, MARCH 25, 1909.

SOURCE:
BURNETT & McGUGAN, SURVEYORS, FEBRUARY 25, 1914.

SOURCE:
PROVINCE OF BRITISH COLUMBIA ORDER IN COUNCIL, JULY 16, 1892.

LEGEND

- GEODETIC CONTROL MONUMENT
- CADASTRAL BOUNDARY
- ROAD

0 40 80

1:1,600 METRES

REFERENCES

1. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
2. IMAGERY COPYRIGHT © ESRI AND ITS LICENSORS. SOURCE: SURREY AERIALS. USED UNDER LICENSE, ALL RIGHTS RESERVED. IMAGERY DATE: 20130115.
3. CEMETERY DRAWINGS OBTAINED FROM:
-CITY OF NEW WESTMINSTER, 1913. LETTER WITH ATTACHED SURVEY PLAN, FROM MAYOR, A.W. GRAY, TO THE MINISTER OF LANDS, W.R. ROSS, DATED FEBRUARY 5, 1913. FILE LOCATED AT BRITISH COLUMBIA, DEPARTMENT OF LANDS, FILE 1948/10, SEC. 1, FOLIO 75 (SURVEYOR GENERAL, "O" SERIES CORRESPONDENCE FILE 0358156, ROLL NO. 2236).
-BURNETT & MCGUGAN (CIVIL ENGINEERS, B.C. LAND SURVEYORS AND DRAUGHTSMEN). 1914. LETTER WITH ATTACHED BLUE PRINT (FACSIMILE COPY) FROM BURNETT & MCGUGAN TO G.H. DAWSON (SURVEYOR GENERAL, VICTORIA BC), DATED FEBRUARY 25, 1914. FILE LOCATED IN THE BC SURVEYOR GENERAL OFFICE, LANDS FILE 0358156.
-PROVINCE OF BRITISH COLUMBIA. 1892. ORDER IN COUNCIL 291-92, RE: CERTAIN LAND GRANTED THE CITY FOR THE ERECTION OF A QUARANTINE HOSPITAL, NEW WESTMINSTER. APPROVED JULY 16, 1892.
-CITY OF NEW WESTMINSTER. 1909. LEASE AGREEMENT BETWEEN THE CORPORATION OF THE CITY OF NEW WESTMINSTER AND THE CHINESE BENEVOLENT ASSOCIATION OF THE CITY OF NEW WESTMINSTER, WITH SURVEY PLAN ATTACHED. SIGNED MARCH 29, 1909. COPY ON FILE AT THE CITY OF NEW WESTMINSTER, OFFICE OF CITY CLERK.
4. GEODETIC CONTROL MONUMENT CONTAINS INFORMATION LICENCED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA
DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
HISTORICAL CEMETERY DRAWING OVERLAYS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-16
DESIGNED	MR
PREPARED	MH/JP/SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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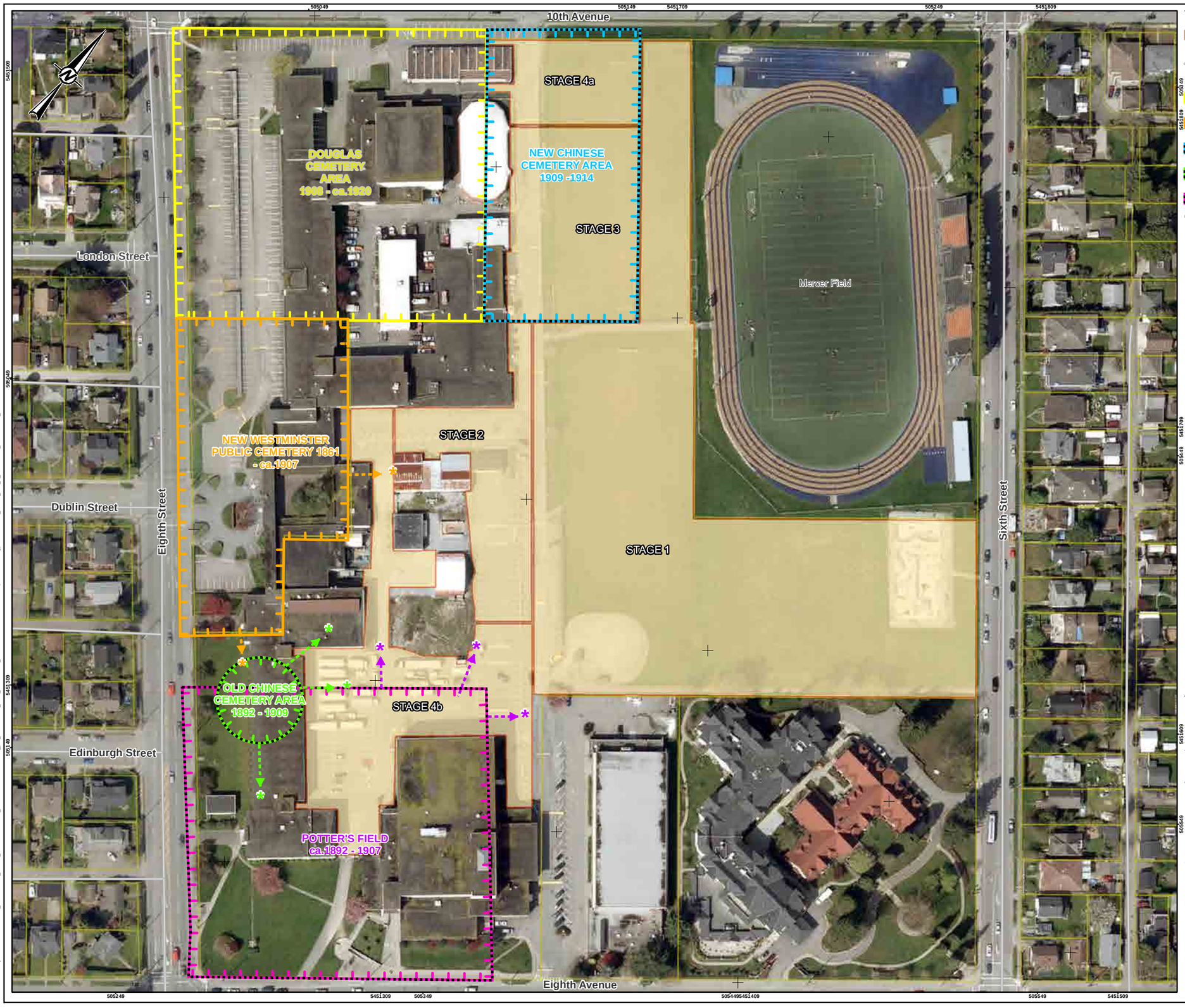

LEGEND

- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS

BASE DATA

- ROAD

HISTORICAL CEMETERY AREAS

- DOUGLAS CEMETERY
  WELL DEFINED LIMITS OF BURIAL AREA
- NEW WESTMINSTER PUBLIC CEMETERY
  WELL DEFINED LIMITS OF BURIAL AREA
- NEW CHINESE CEMETERY
  LEASED BOUNDARY BUT EXTENT OF USE UNCERTAIN
- OLD CHINESE CEMETERY
  ESTIMATED LOCATION AND EXTENT OF AREA UNKNOWN
- POTTER'S FIELD
  MAPPED BOUNDARY BUT EXTENT OF USE UNCERTAIN
- SEE DISCUSSION IN SECTION 4.1.1

0 40 80

1:1,600 METRES

REFERENCES

1. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
2. HISTORICAL INTERPRETATION OF ARCHIVAL SOURCES AND STAGE AREAS BY GOLDER ASSOCIATES LTD.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
NEW WESTMINSTER SECONDARY SCHOOL

TITLE
POSSIBLE CEMETERY AREA ASSOCIATIONS WITH INVESTIGATION AREAS

CONSULTANT

Golder Associates

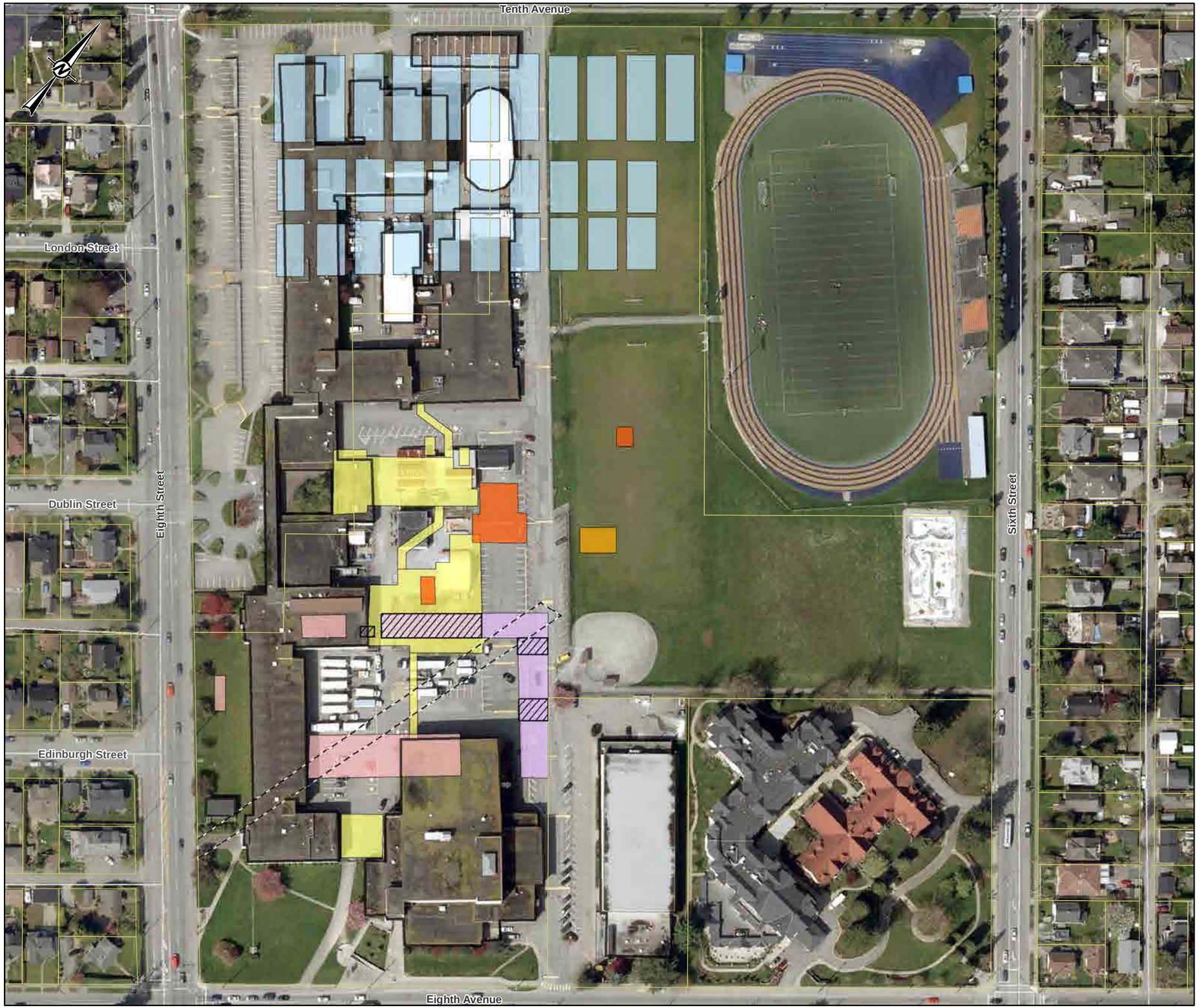
YYYY-MM-DD	2017-04-05
DESIGNED	CM
PREPARED	AD/SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\New_Westminster_School_District\NWSS\99_PROJECTS\0714120151_pre_construction_Arch_Services\02_PRODUCTION\15400\MXD\Report\Archaeology\0714120151_15400_FIG_5_POSSIBLE_CEMETERY_AREA.mxd PRINTED ON: 2017-06-12 AT: 11:32:14 AM



LEGEND

EXISTING BUILDINGS

APPROXIMATE LOCATIONS OF HISTORICAL STRUCTURES

- ISOLATION HOSPITAL 1892 -1911
- ROAD 1892-1915
- NEW ISOLATION HOSPITAL, CARETAKER HOUSE AND OUTHOUSE 1912 - 1938
- CITY WORKS YARD SHEDS 1935 - 1948
- CITY WORKS YARD SHEDS 1915 - 1935
- CITY WORKS YARD STABLE 1915 - 1948
- WESTMINSTER REGIMENT TRAINING BARRACKS 1939 - 1945
- SCHOOL RELATED STRUCTURE DEMOLISHED POST -1949

BASE DATA

- LOCAL ROAD
- LOCAL STREET
- PARCEL

0 40 80

1:1,600 METRES

NOTES

1. HISTORICAL STRUCTURE LOCATIONS ARE APPROXIMATE.

REFERENCES

1. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
2. HISTORICAL STRUCTURES FROM GOLDER ASSOCIATES LTD.

DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT

SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT

NEW WESTMINSTER SENIOR SECONDARY SCHOOL PROJECT

TITLE

HISTORICAL STRUCTURES

CONSULTANT

Golder Associates

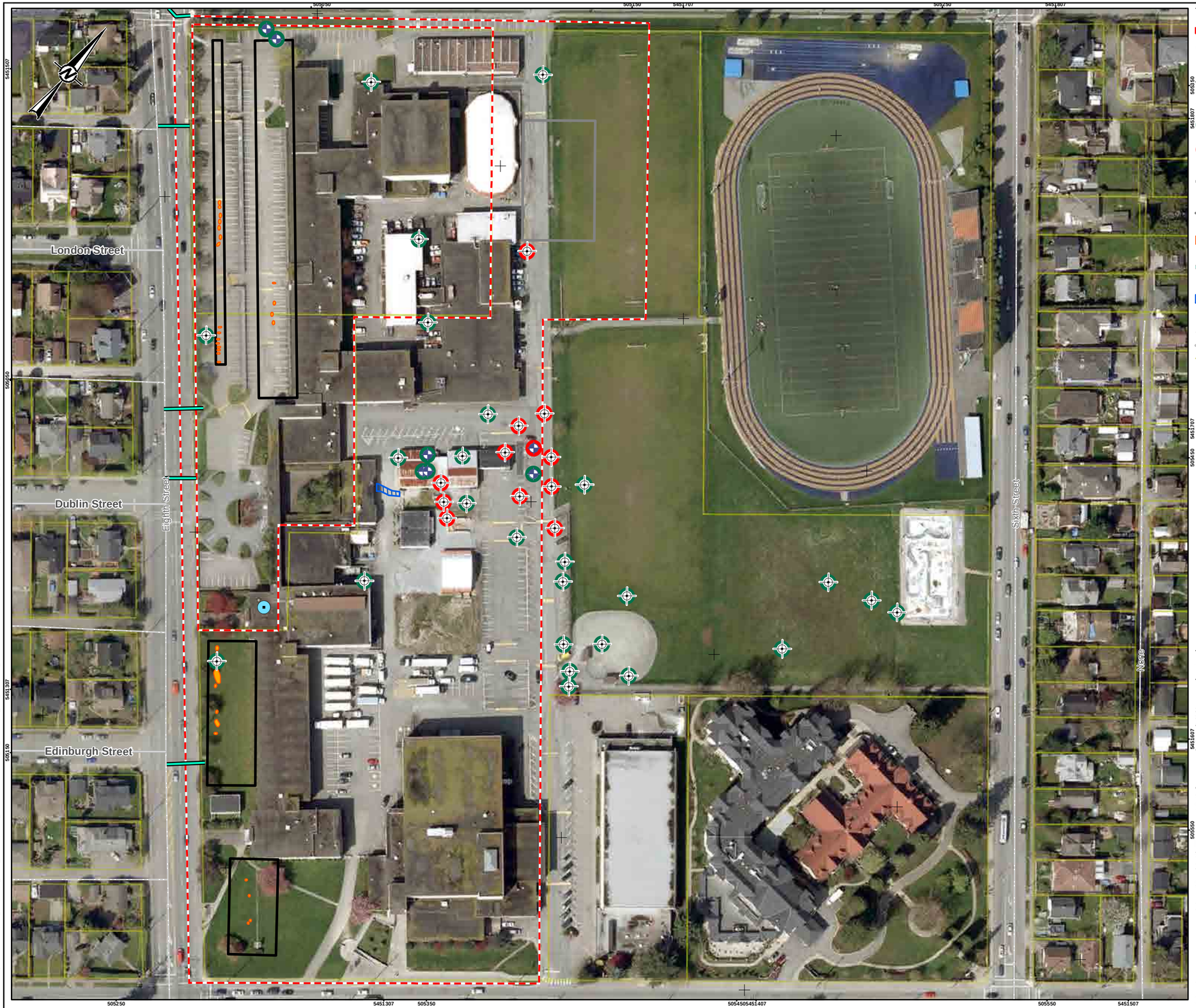
YYYY-MM-DD	2017-03-16
DESIGNED	CM
PREPARED	AD
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	6

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

PATH: Y:\burnaby\CAD-GIS\Client\New_Westminster_School_District\NWSS 999_PROJECTS\0714120151_pre_construction_Arch_Services\02_PRODUCTION\15400\MXD\Report\Archaeology\0714120151_15400_FIG_6_HISTORICAL_STRUCTURES.mxd PRINTED ON: 2017-06-12 AT: 11:44:14 AM



LEGEND

- ARCHAEOLOGICAL SITE DhRr-233, DESIGNATED 2014
- APPROXIMATE LOCATION OF HUMAN REMAINS FOUND IN 1949

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

- BOREHOLE
- MONITORING WELL
- MONITORED BY ARCHAEOLOGIST (NEGATIVE)
- MONITORED BY ARCHAEOLOGIST (POSITIVE FOR HISTORIC MATERIALS)
- AREA SURVEYED WITH GROUND PENETRATING RADAR (GPR) WITH SOME GRAVE-LIKE SIGNATURES (2007 AND 2012)
- AREA SURVEYED WITH GROUND PENETRATING RADAR (GPR) WITH NO GRAVE-LIKE SIGNATURES (2012)
- SELECTED GPR SIGNATURES THAT ARE CONSISTENT WITH GRAVE SITES
- SUBSURFACE MONITORING (NEGATIVE) 2012, DEPTHS 50 cm - 100 cm
- SUBSURFACE MONITORING (APPROXIMATE LOCATION) (NEGATIVE) 2013, DEPTH TO 1.2 m

BASE DATA

- LOCAL ROAD
- LOCAL STREET
- PARCEL

0 40 80

1:1,600 METRES

NOTES

1. TEST LOCATIONS, GPR ANAMOLIES AND CEMETERY BOUNDARYIES ARE APPROXIMATE.

REFERENCES

1. ARCHAEOLOGICAL SITES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS ON 20160106
2. HISTORICAL DATA CREATED BY GOLDER ASSOCIATES LTD FROM INFORMATION OBTAINED TO DATE.
3. INVESTIGATIONS CONDUCTED BY GOLDER CREATED BY GOLDER ASSOCIATES LTD.
4. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
PRE-CONSTRUCTION ARCHAEOLOGICAL SERVICES FOR NEW WESTMINSTER SECONDARY SCHOOL PROJECT, SCHOOL

TITLE
SUMMARY OF PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-16
DESIGNED	CM
PREPARED	AD
REVIEWED	CRM
APPROVED	ARM

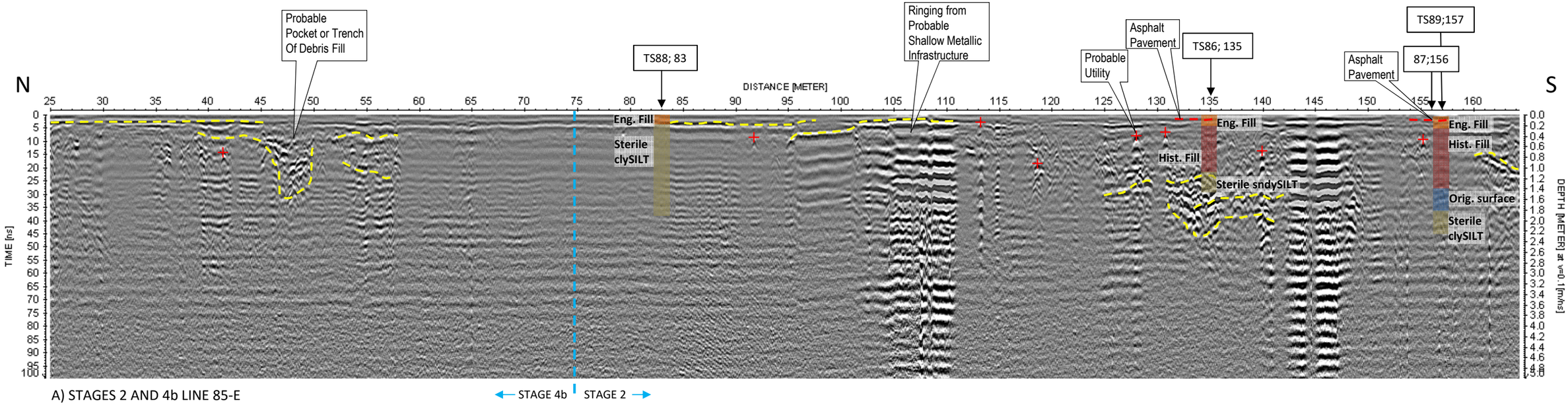
PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	7

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

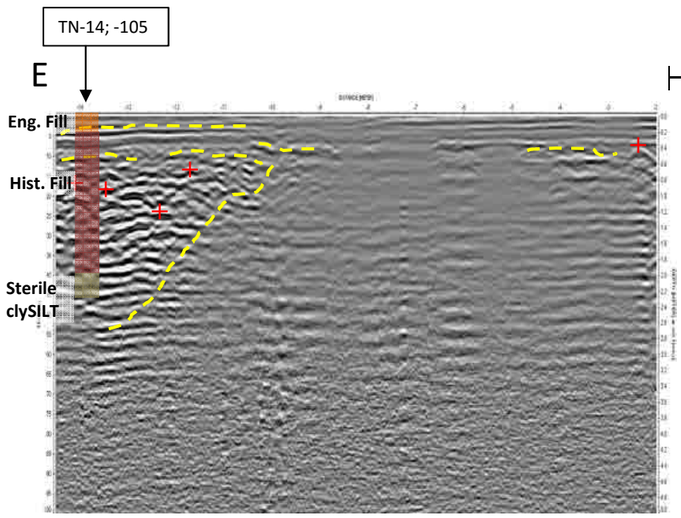
25mm

0

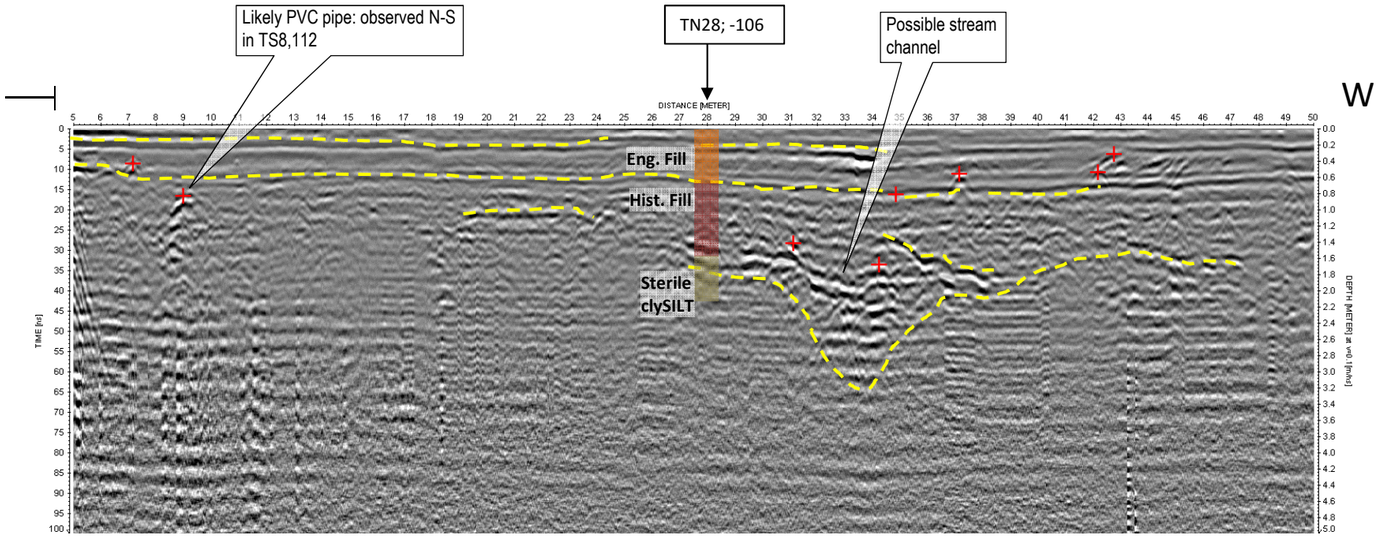
PATH: Y:\burnaby\CAD-GIS\Client\New_Westminster_School_District\NWSS\99_PROJECTS\0714120151_1_pre_construction_Arch_Services\02_PRODUCTION\15400\MXD\ReportArchaeology\0714120151-15400_FIG_7_PREVIOUS_ARCHAEOLOGICAL_INVESTIGATION.mxd PRINTED ON: 2017-06-12 AT: 11:43:38 AM



A) STAGES 2 AND 4b LINE 85-E



7m



B) STAGE 3 LINE 106.5-S

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

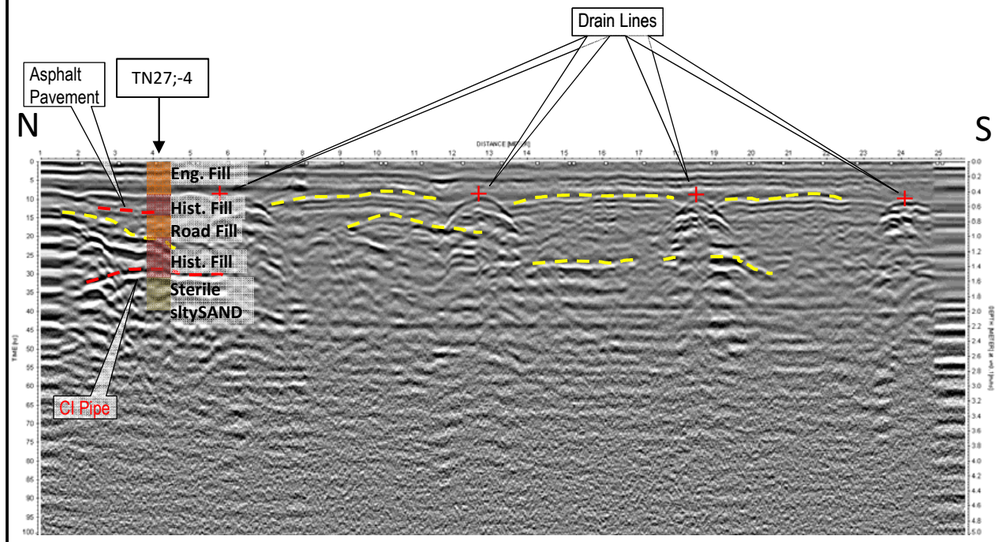
YYYY-MM-DD	2017-06-12
PREPARED	GJ
DESIGNED	GJ/ RDL
REVIEWED	RDL
APPROVED	CM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

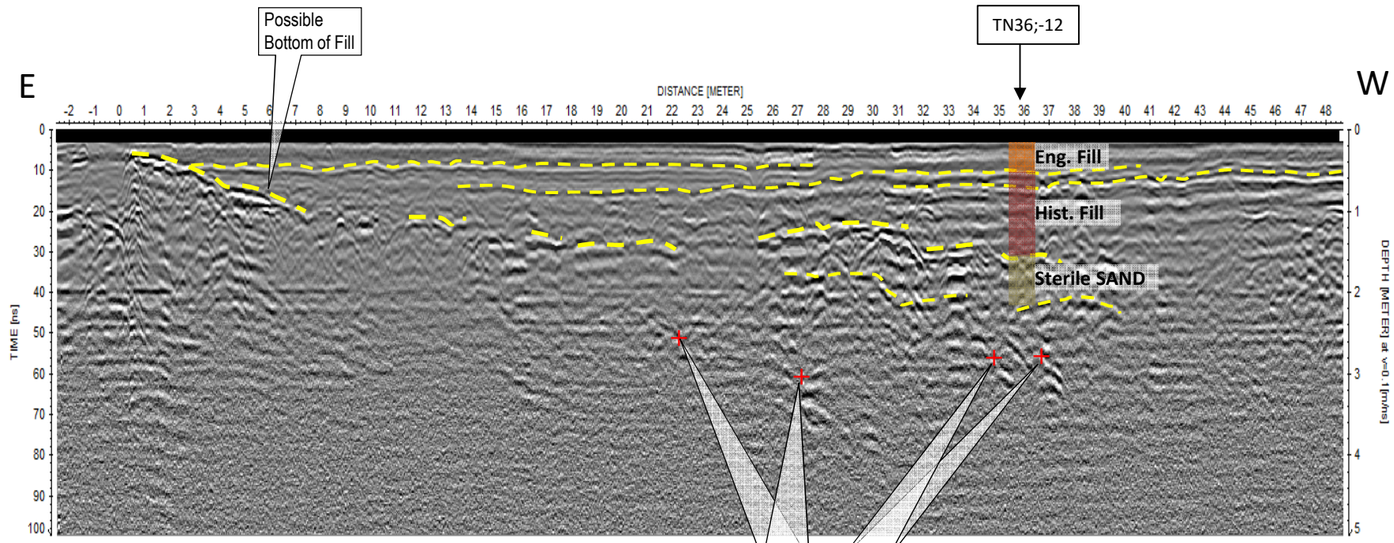
TITLE
GPR Profiles: N-S Stages 2 and 4b; E-W Stage 3

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	16300	0	8

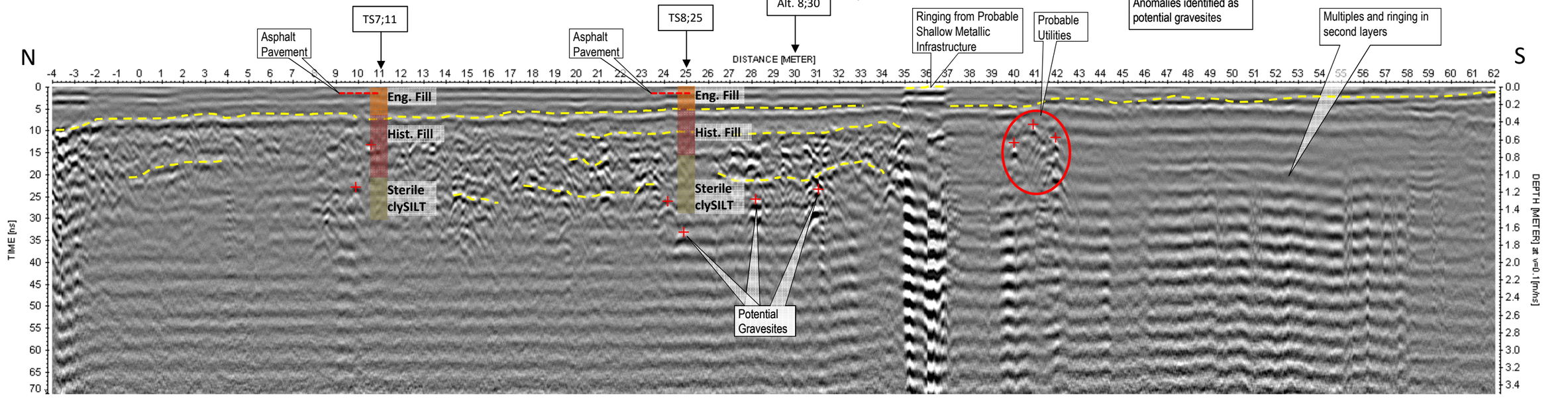
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
25 mm
0



A) STAGE 4a LINE 26.5-E



B) STAGE 4a LINE 11.5-S



B) STAGE 4b LINE 8-E

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

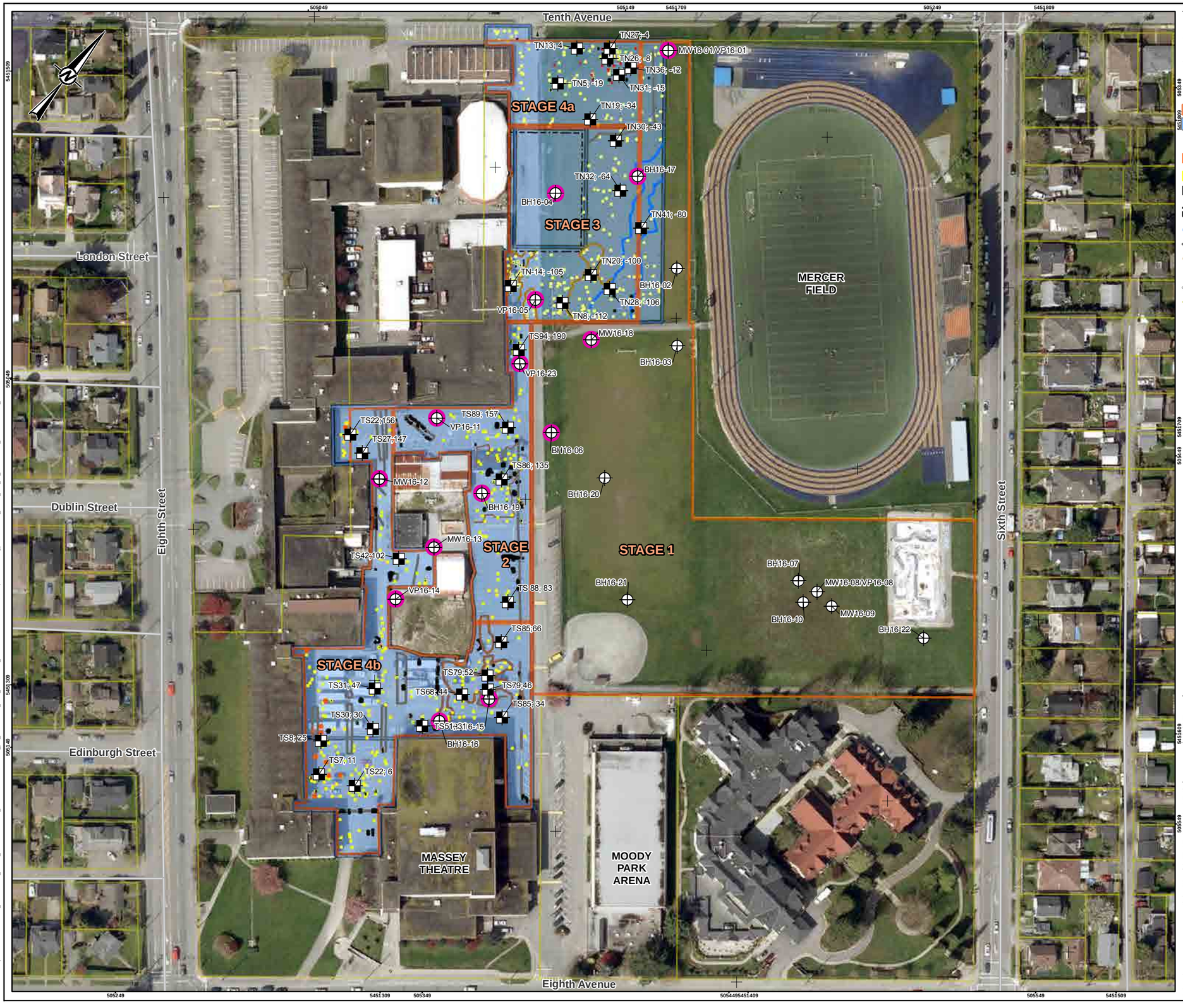
YYYY-MM-DD	2017-06-12
PREPARED	GJ
DESIGNED	GJ/RDL
REVIEWED	RDL
APPROVED	CM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
GPR Profiles: N-S and E-W Stage 4a;
N-S Stage 4b

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	16300	0	9

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B
25 mm
0



LEGEND

- ARCHAEOLOGICAL TEST PIT LOCATION
- GEOTECHNICAL AND/OR GEOENVIRONMENTAL BOREHOLE LOCATION
- ARCHAEOLOGICALLY MONITORED SURSURFACE INVESTIGATION
- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS
- GEOPHYSICAL SURVEY AREAS, WHERE EM AND GPR DATA COLLECTED

INTERPRETED GEOPHYSICAL DATA

- GEOPHYSICAL ANOMALIES THAT ARE CONSISTENT WITH POTENTIAL GRAVESITES
- GEOPHYSICAL ANOMALIES OF INTEREST - UNCERTAIN ORIGIN
- BURIED METAL
- AREA GEOPHYSICALLY SURVEYED PREVIOUSLY WITH NEGATIVE RESULTS FOR POTENTIAL GRAVESITES
- POSSIBLE BURIED STREAM CHANNEL
- BURIED INFRASTRUCTURE
- ZONES OF SUSPECTED DEBRIS FILL

BASE DATA

- ROAD
- PARCEL

0 40 80

1:1,600 METRES

REFERENCES

1. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
2. TEST LOCATIONS AND STAGE AREAS CREATED BY GOLDER ASSOCIATES LTD.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
OVERVIEW PLAN OF SUBSURFACE INVESTIGATIONS

CONSULTANT

Golder Associates

YYYY-MM-DD	2017-01-30
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	10

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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LEGEND

- SELECT GPR TRANSECT
- TEST EXCAVATION
- GEOPHYSICAL SURVEY GRIDLINE
- GEOPHYSICAL ANOMALIES OF INTEREST - UNCERTAIN ORIGIN
- BURIED METAL
- ZONES OF SUBSURFACE DEBRIS FILL
- BURIED INFRASTRUCTURE
- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS

RESIDUAL CONDUCTIVITY (mS/m)

-5 -4 -3 -2 -1 0 1 2 3 4 5

REFERENCE(S)

1. GPR DATA CREATED BY GOLDER ASSOCIATES.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

NOTE(S)

EM 38 IMAGE IS RESIDUAL CONDUCTIVITY

0 8 16

1:400 METRES

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-16
DESIGNED	CM
PREPARED	JP / SB / AD
REVIEWED	CRM
APPROVED	ARM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 2 EM38 IMAGE AND TEST LOCATIONS

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	11

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

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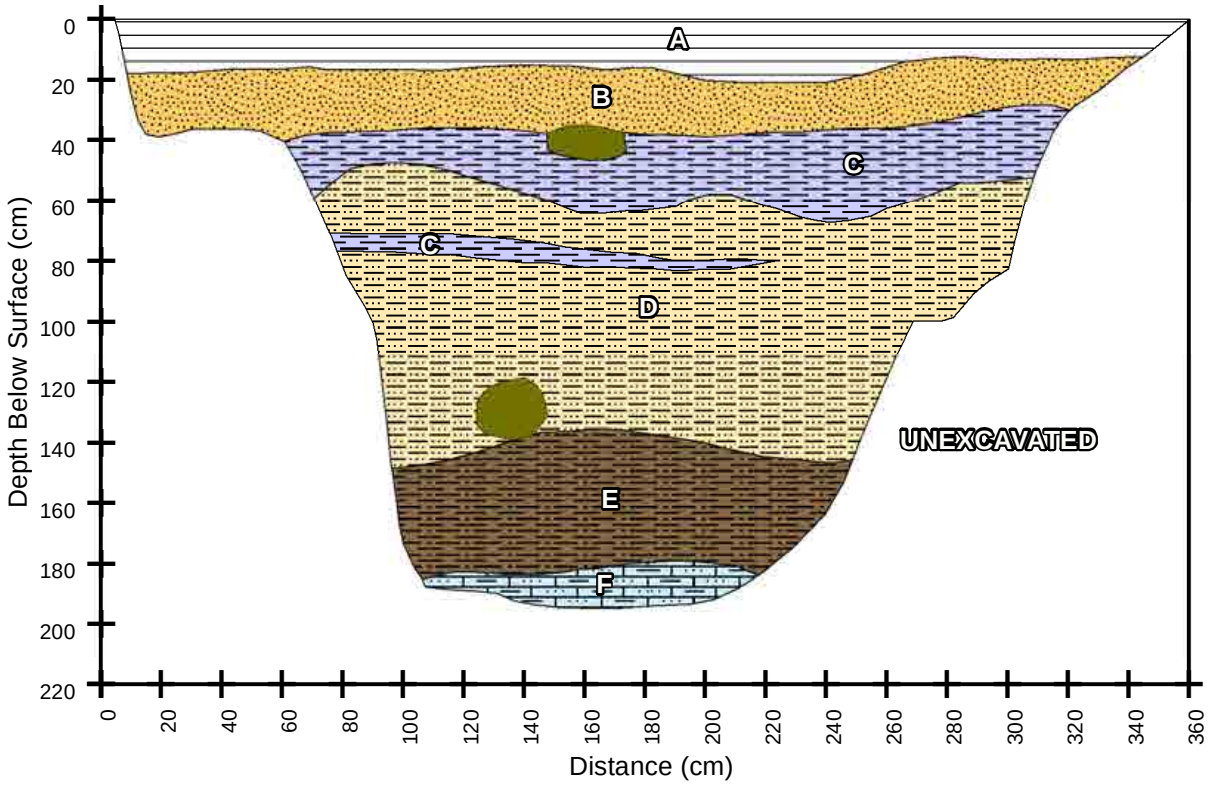
North Wall Profile



LEGEND

- LAYER A: ASPHALT
- LAYER B: BROWN SAND WITH ABUNDANT GRAVELS AND COBBLES
- LAYER C: BLUE/GREY CLAY WITH TRACE SILT; DISTURBED STERILE SEDIMENT
- LAYER D: MOTTLED LIGHT TO MEDIUM BROWN SILT WITH TRACE SAND
- LAYER E: DARK BROWN TO BLACK SILT WITH TRACE SAND AND ORGANICS; DISTURBED
- LAYER F: BLUE/GREY CLAY WITH TRACE SILT
- UNEXCAVATED
- ROOT

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

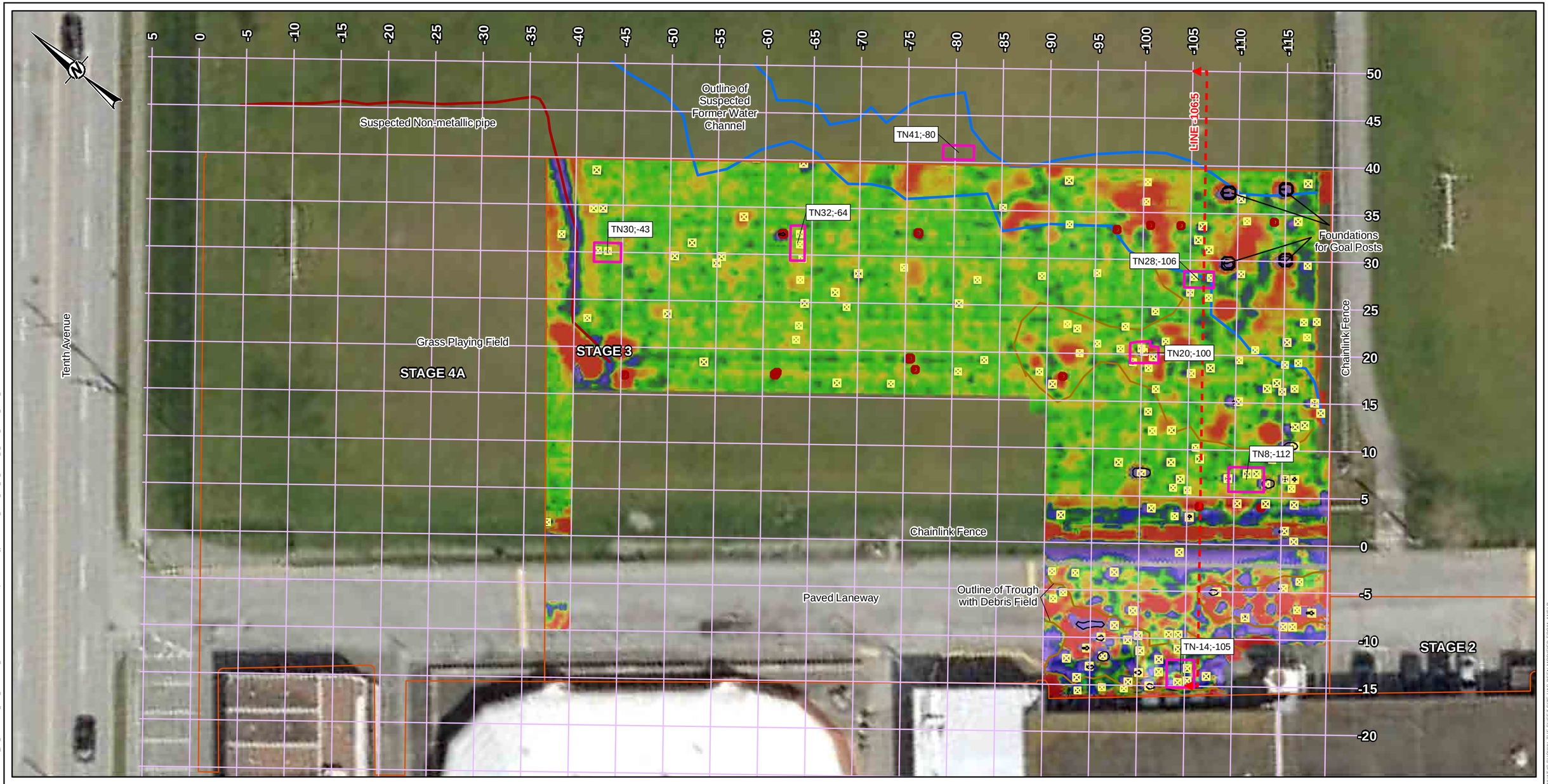
PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 2 SOIL PROFILE TS89;157

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	154000/15405	0	12



LEGEND

- SELECT GPR TRANSECT
- EXCAVATION
- GEOPHYSICAL SURVEY GRIDLINE
- GEOPHYSICAL ANOMALIES OF INTEREST - UNCERTAIN ORIGIN
- BURIED METAL
- BURIED INFRASTRUCTURE
- POSSIBLE BURIED STREAM CHANNEL
- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS

RESIDUAL CONDUCTIVITY (mS/m)

-5 -4 -3 -2 -1 0 1 2 3 4 5

REFERENCE(S)

1. GPR DATA CREATED BY GOLDER ASSOCIATES.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

0 8 16

1:400 METRES

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-30
DESIGNED	CM
PREPARED	JP / SB / AD
REVIEWED	CRM
APPROVED	ARM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 3 EM38 IMAGE AND TEST LOCATIONS

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	13

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

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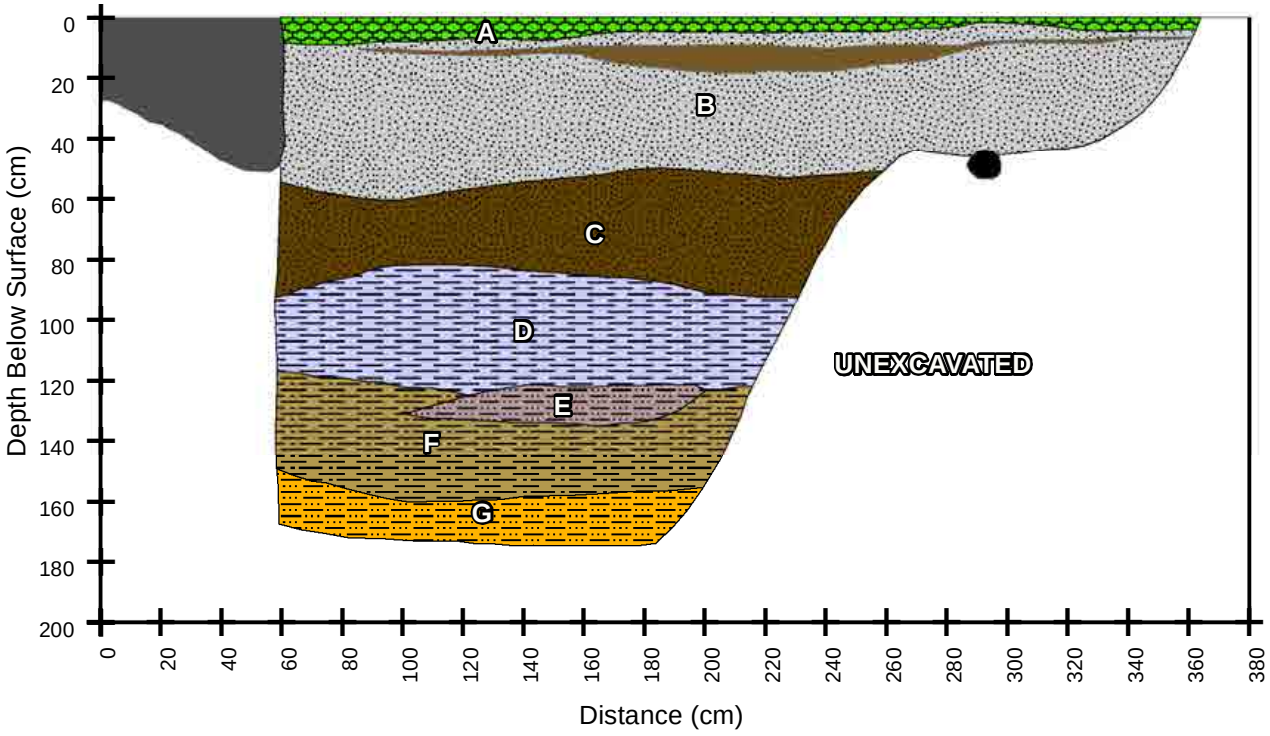
North Wall Profile



LEGEND

- LAYER A: GRASS
- DARK BROWN ORGANIC LENS IN SAND (WITH ROOTS)
- LAYER B: GREY SAND WITH A DARK BROWN LENS ASSOCIATED WITH ORGANIC SEDIMENT; MIGRATION FROM SOD
- LAYER C: MOTTLED DARK AND MEDIUM BROWN SANDY SILT WITH ORANGE/BROWN SAND
- LAYER D: BLUE/GREY CLAYEY SILT WITH MOTTLED BROWN SILT; DISTURBED STERILE SEDIMENT
- LAYER E: DARK GREY/BROWN CLAYEY SILT CONCENTRATION
- LAYER F: DARK BROWN TO MEDIUM BROWN SILTY SAND WITH ORGANICS
- LAYER G: LIGHT BROWN MOTTLED WITH ORANGE SANDY SILT
- UNEXCAVATED
- PIPE
- BOULDER

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 3 SOIL PROFILE TN32;-64

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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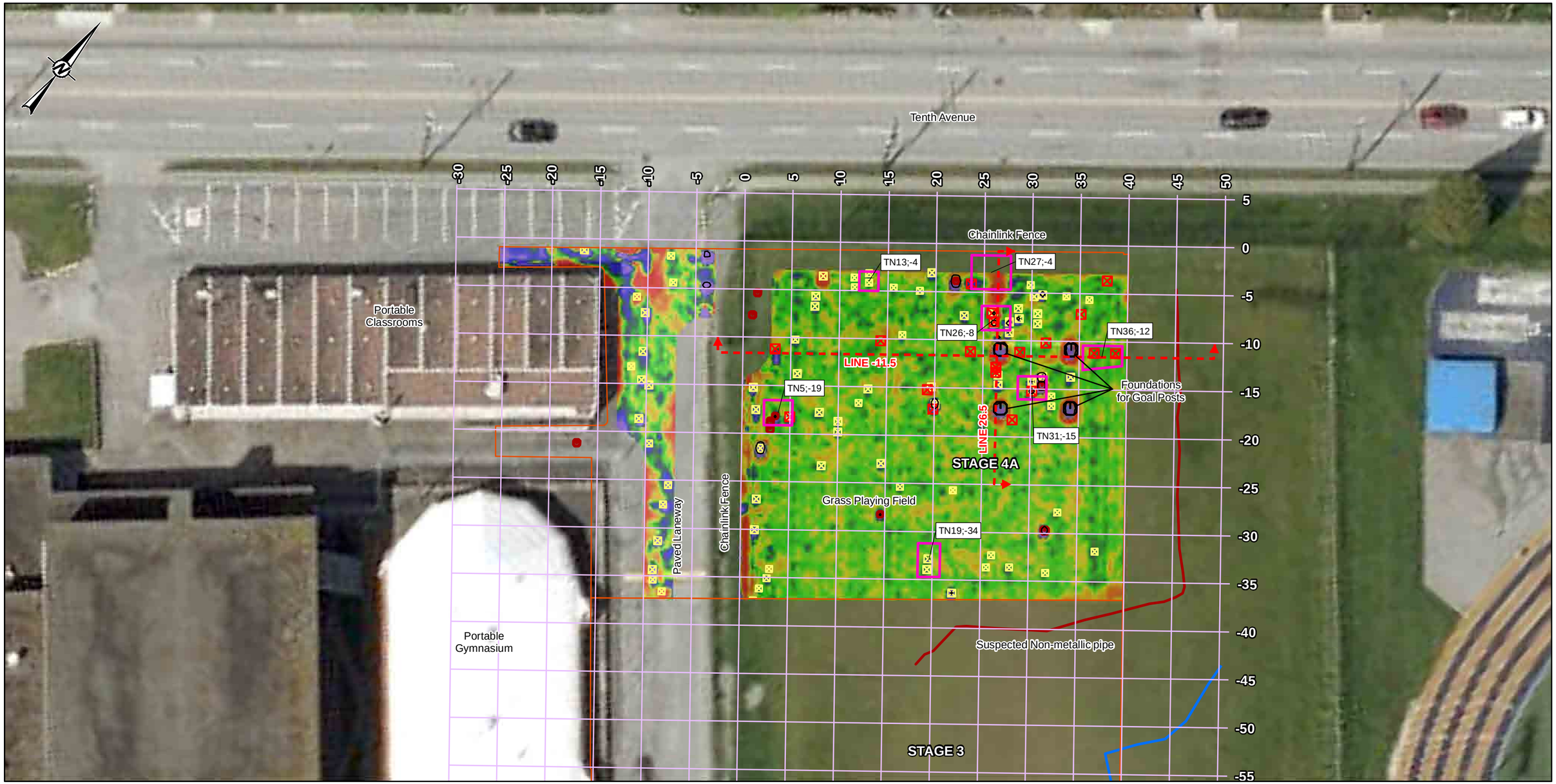

LEGEND

- SELECT GPR TRANSECT
- EXCAVATION
- GEOPHYSICAL SURVEY GRIDLINE
- GEOPHYSICAL ANOMALIES THAT ARE CONSISTENT WITH POTENTIAL GRAVE SITES
- GEOPHYSICAL ANOMALIES OF INTEREST - UNCERTAIN ORIGIN
- BURIED METAL
- BURIED INFRASTRUCTURE
- POSSIBLE BURIED STREAM CHANNEL
- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS

RESIDUAL CONDUCTIVITY (mS/m)

-5 -4 -3 -2 -1 0 1 2 3 4 5

REFERENCE(S)

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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

0 8 16

1:400 METRES

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-03-16
DESIGNED	CM
PREPARED	JP / SB/ AD
REVIEWED	CRM
APPROVED	ARM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 4A EM38 IMAGE AND TEST LOCATIONS

PROJECT NO.	PHASE	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm

0

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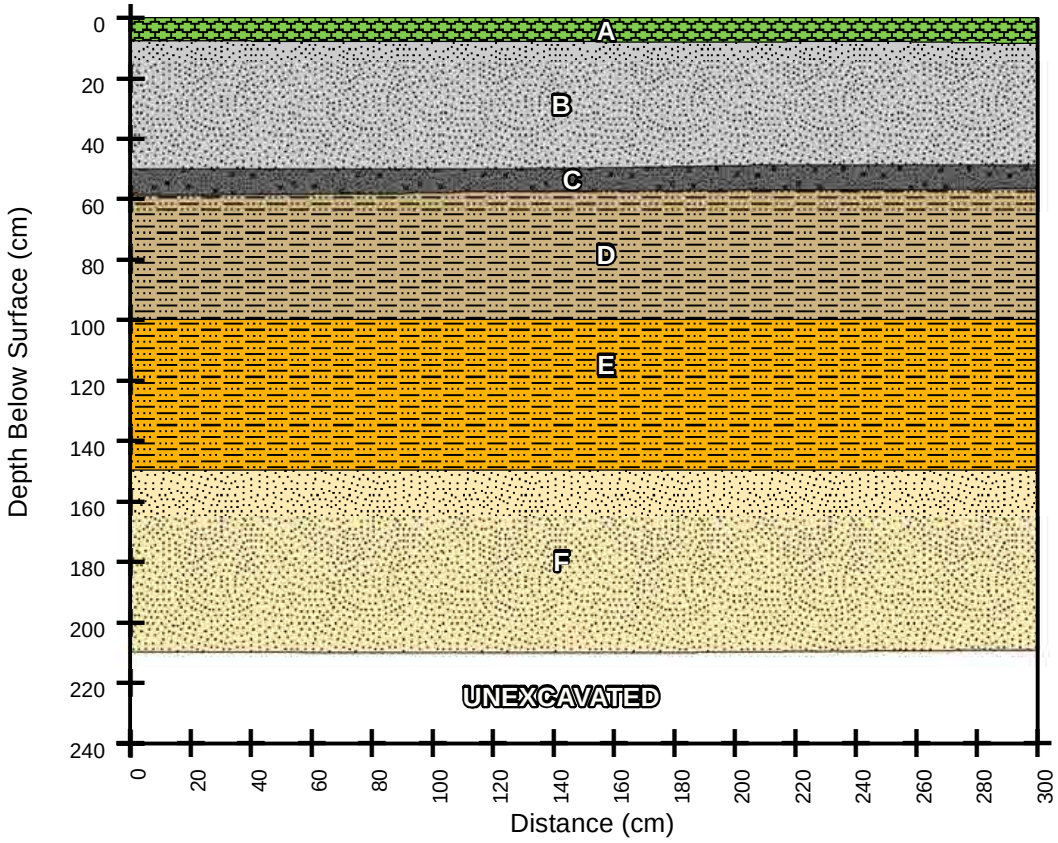
North Wall Profile



LEGEND

- LAYER A: GRASS
- LAYER B: GREY SAND
- LAYER C: GREY SAND WITH ABUNDANT GRAVELS; ASSOCIATED WITH A PIPE
- LAYER D: MOTTLED MEDIUM BROWN SILTY SAND WITH GREY SILTY CLAY
- LAYER E: MOTTLED ORANGE/BROWN SILTY SAND WITH DARK BROWN SANDY SILT
- LAYER F: LIGHT BROWN MOTTLED WITH ORANGE SILTY SAND
- UNEXCAVATED

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 4A SOIL PROFILE TN26;-8

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
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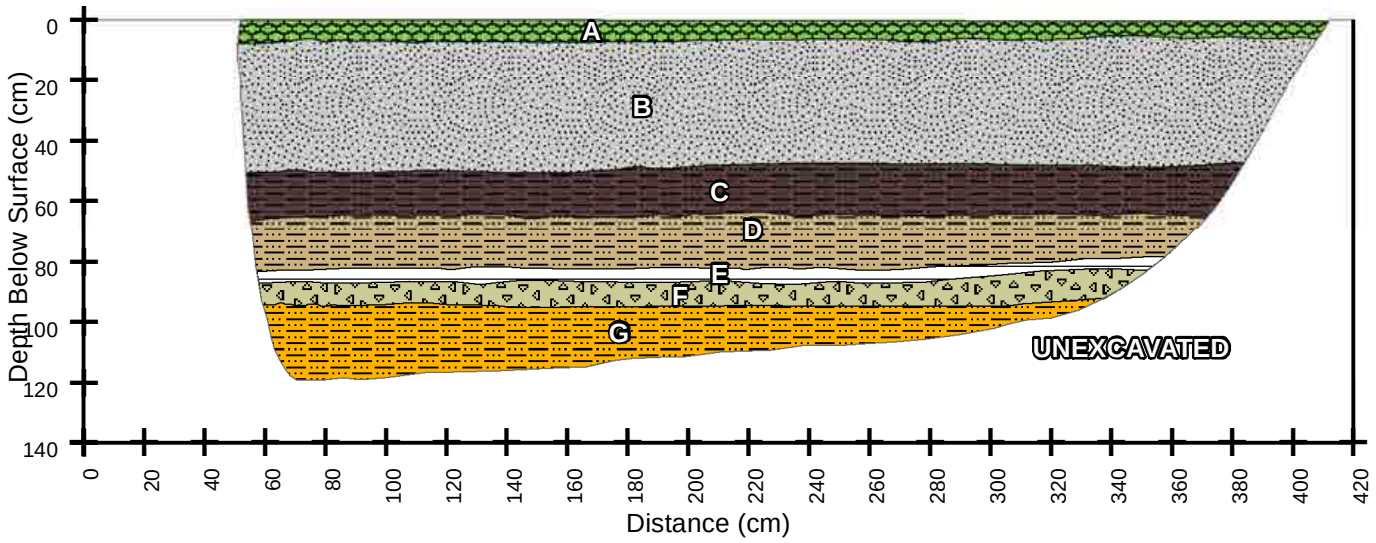
North Wall Profile



LEGEND

- LAYER A: GRASS
- LAYER B: GREY SAND
- LAYER C: DARK GREY SILT WITH TRACE CLAY AND SAND MOTTLED WITH BLUE/GREY CLAYEY SILT AND LIGHT BROWN SANDY SILT
- LAYER D: LIGHT BROWN MOTTLED WITH ORANGE SILTY SAND AND MOTTLED LIGHT GREY AND LIGHT BROWN CLAYEY SILT
- LAYER E: ASPHALT
- LAYER F: BROWN SAND WITH ABUNDANT GRAVELS AND COBBLES
- LAYER G: ORANGE/BROWN SAND MOTTLED WITH DARK BROWN SANDY SILT AND DARK BROWN TO BLACK SILTY SAND WITH ORGANICS; DISTURBED
  INTERPRETED ORIGINAL SURFACE
- UNEXCAVATED

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 4A SOIL PROFILE TN27;-4

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	154000/15405	0	17

LEGEND

- SELECT GPR TRANSECT
- EXCAVATION
- GEOPHYSICAL SURVEY GRIDLINE
- GEOPHYSICAL ANOMALIES THAT ARE CONSISTENT WITH POTENTIAL GRAVE SITES
- GEOPHYSICAL ANOMALIES OF INTEREST - UNCERTAIN ORIGIN
- BURIED METAL
- ZONES OF SUBSURFACE DEBRIS FILL
- BURIED INFRASTRUCTURE
- STAGE AREAS FOR SUBSURFACE INVESTIGATIONS

RESIDUAL CONDUCTIVITY (mS/m)

-5 -4 -3 -2 -1 0 1 2 3 4 5

REFERENCE(S)

1. GPR DATA CREATED BY GOLDER ASSOCIATES.
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DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

0 12 24

1:600 METRES

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-30
DESIGNED	CM
PREPARED	JP / SB
REVIEWED	CRM
APPROVED	ARM

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT, NEW WESTMINSTER, B.C.

TITLE
STAGE 4B EM38 IMAGE AND TEST LOCATIONS

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	15400/15405	0	18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

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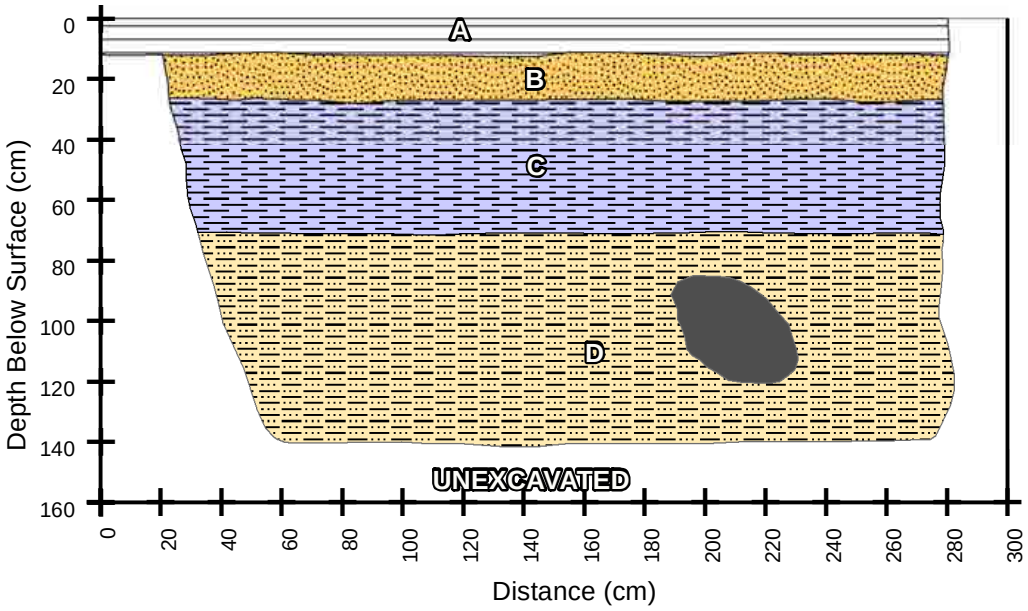
West Wall Profile



LEGEND

- LAYER A: ASPHALT
- LAYER B: BROWN SAND WITH ABUNDANT GRAVELS AND COBBLES
- LAYER C: MOTTLED DARK BROWN AND ORANGE/BROWN SILTY SAND
- LAYER D: MOTTLED LIGHT BROWN AND LIGHT GREY CLAYEY SILT
- UNEXCAVATED
- BOULDER

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

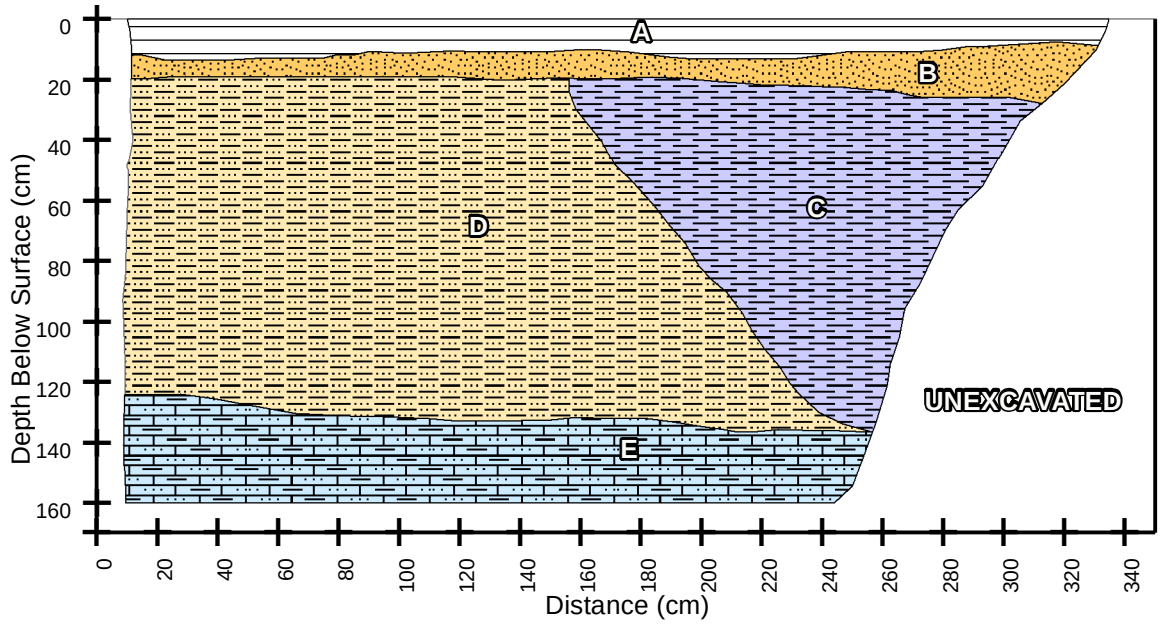
TITLE
STAGE 4B SOIL PROFILE TS8;25

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	154000/15405	0	19

East Wall Profile



LEGEND

- LAYER A: ASPHALT
- LAYER B: BROWN SAND WITH ABUNDANT GRAVELS AND COBBLES
- LAYER C: MOTTLED MEDIUM BROWN SILTY SAND WITH MOTTLED LIGHT BROWN AND LIGHT GREY CLAYEY SILT (DISTURBED STERILE SEDIMENT); ASSOCIATED WITH PIPE
- LAYER D: MOTTLED LIGHT BROWN AND LIGHT GREY CLAYEY SILT
- LAYER E: MEDIUM GREY SANDY SILT
- UNEXCAVATED

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT,
NEW WESTMINSTER, B.C.

TITLE
STAGE 4B SOIL PROFILE TS85;66

CONSULTANT
Golder Associates

YYYY-MM-DD	2017-01-27
DESIGNED	MR
PREPARED	SB
REVIEWED	CRM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	154000/15405	0	20

APPENDIX A

Select Photos

Photo 1: View East toward Stage 1 (site DhRr-51 located to right and Mercer Field located out of frame to left), while preparing for borehole placement with GPR for utility locates.

Photo 2: View north over Stage 1 and BH16-20, with Mercer Field to right; and DhRr-233, paved lane and parking, and school structures to left.

Photo 3: View of matrix in auger at BH16-04, looking northeast.

Photo 4: View north to TS86;135 in Stage 2.

Photo 5: View north into TS94;190 with boulders (foreground), log section, and sheet metal.

Photo 6: Enamel basin collected from TS86;135 and enamel mug collected from TN26;8.

Photo 7: View west into TS86;135.

Photo 8: Indicative faunal (bone and shellfish) recovered from locations: (a) calcined fragments collected from TN28;-106, (b) TN41;-80, (c) TN-14;-105, (d)Stage 2 TS89;157, (e)Stage 3 TN-14;-105 (f)TN 20;-100, and (g) Stage 4a TN26;-8.

Photo 9: Ceramic sherds collected from (a) Stage 2 TS86;135, (b) Stage 3 TN8;-112, (c) Stage 4a TN36;-12, and (d) Stage 4b TS22;6.

Photo 10: View northwest to Stage 3.

Photo 11: View west into TN41;-80, with a possible original land surface (with dark organics) under engineered sandy fill to a depth of about 60 cm.

Photo 12: View south into TN-14;-105 and stave-wood pipe located to the right of the measuring tape.

Photo 13: Historic artifacts collected and observed from TN-14;-105.

Photo 14: Faunal collected from (a) TN-14;-105, and (b) TN28;-106.

Photo 15: Ceramic sherds from TN-14;-105 containing maker's mark from (a) Johnson Bros Ltd., (b) Booths Ltd., and (c) Morimura family.

Photo 16: Recovered glass bottles: (a) "Orange Crush" from TN30;-43, (b); beverage bottle from TN31;-15, and (c) green glass beverage bottle from TN-14;-105.

Photo 17: Recovered glass bottle fragments with markers marks: (a) base sherd collected from TN19;-34, (b) sherd from TN19;-34, (c) base sherd with Dominion Glass Company logo from TN26;-8, (d) United Distiller Limited glass bottle base sherd from TN26;-8, (e) sherd from TN31;-15, (f) Kerr glass jar sherd from TN8;-112, (g) brown glass bottle sherd from TN8;-112, (h) brown glass bottle sherd from TN8;-112,; and (i) pickle jar base sherd from TN-14;-105.

Photo 18: Medical jars collected from TN-14,-105: (a) Whitehall Pharmacal Company Rowles Mentho-Sulphur Compound, (b) Mentholatum Ointment from Mentholatum Company, (c) Vicks Vabour Rub, and (d) cold cream cosmetic jar.

Photo 19: Collected Nails from: (a) TN32;-64, (b) TN41;80, (c) TN26;-8 (middle), and (d) TN-14,-105.

Photo 20: "Puritan Meatballs and gravy" tin can collected from TN-14;-105.

Photo 21: (a) Clay drain tile pipe fragment collected from TN36;-12, (b) brick fragment from TN26;-8, (c); threaded pipe fitting with gasket from TN-14;-105, (d) metal pipe and plug from TN31;-15, (e) structural ceramic sherd and tile from TN14;-105, (f) composite insulator from TN -14;-105, and (g) nut and bolt from TN 14;-105.

Photo 22: View east northeast to Stage 4a.

Photo 23: View into TN36;-12 with PVC pipe and drain rock visible near surface.

Photo 24: View looking south into TN5;-19, showing two PVC pipe alignments.

Photo 25: Historic artifacts collected from TN19;-34.

Photo 26: View northwest to Stage 4b.

Photo 27: View west into TS31;47, exposing glazed clay sewer pipe.

Photo 28: View south into TS7;11.

Photo 29: View west into TS79;46.

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APPENDIX B

Cultural and Institutional Groups Affiliated with Specific Cemetery Areas

APPENDIX B
Cultural and Institutional Groups Affiliated with Specific Cemetery Areas

Table 1: Cultural and Institutional Groups Affiliated with Specific Cemetery Areas

Group	Dates	Historical Cemetery Name	Current Names for Areas where Burials may be Located
City of New Westminster • Indigents • Isolation hospital patients	ca. 1861 to ca. 1920	• New Westminster Public Cemetery • Potter's Field and possibly areas closer to the isolation hospital (1892 to 1908) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 • Stages 2 and 4b
Provincial Government, Public Hospital for the Insane • Burial of patients	ca. 1876 to ca. 1920	• New Westminster Public Cemetery • Potter's Field (1892 to 1908) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 • Stage 4b • Stage 2?
Provincial Government, Essondale • Burial of patients	ca. 1908 to ca. 1920	• Douglas Cemetery	• Dedicated Cemetery Area
Provincial Government, New Westminster Gaol • Burial of the executed and other prisoners	ca. 1879 to ca. 1920	• New Westminster Public Cemetery • Potter's Field (1892 to 1908) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 • Stage 4b • Stage 2?
Provincial Government, Oakalla Prison Farm (Burnaby) • Burial of the executed and other prisoners	ca. 1911 to ca. 1920	• Douglas Cemetery	• Dedicated Cemetery Area
Federal Government of Canada, B.C. Penitentiary (New Westminster) • Burial of prisoners	ca. 1876 to ca. 1913	• New Westminster Public Cemetery • Potter's Field (1892 to 1908) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 • Stage 4b • Stage 2?
Royal Columbian Hospital (operated initially by independent board and later the Provincial Government) • Burial of indigent patients and stillborns	ca. 1861 to ca. 1920	• New Westminster Public Cemetery • Potter's Field (1892 to 1908) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 • Stage 4b • Stage 2?

APPENDIX B
Cultural and Institutional Groups Affiliated with Specific Cemetery Areas

Group	Dates	Historical Cemetery Name	Current Names for Areas where Burials may be Located
Anglican (Holy Trinity Parish)	ca. 1861 to ca. 1869	• New Westminster Public Cemetery	• Dedicated Cemetery Area
Wesleyan (Methodist congregation)	ca. 1861 to ca. 1870	• New Westminster Public Cemetery	• Dedicated Cemetery Area
Presbyterian (St. Andrew's congregation)	ca. 1861 to ca. 1870	• New Westminster Public Cemetery	• Dedicated Cemetery Area
Roman Catholic (St. Peter's Parish)	ca. 1861 to ca. 1883	• New Westminster Public Cemetery	• Dedicated Cemetery Area
New Westminster Masonic Lodge	ca. 1861 to ca. 1872	• New Westminster Public Cemetery	• Dedicated Cemetery Area (based on inscriptions on a granite monument which was relocated to Sapperton sometime after 1891, there had been just three Freemasons interred at the New Westminster Public Cemetery, and these bodies may have been exhumed and reburied at Sapperton as well)
Chinese Community (represented by the Chinese Benevolent Association of New Westminster 1909 to 1914 (and likely prior)	ca. 1860 to ca. 1920	• New Westminster Public Cemetery • Old Chinese Cemetery (1892 to 1908) • New Chinese Cemetery (1909 to 1914) • Douglas Cemetery	• Dedicated Cemetery Area • DhRr-233 Stages 3, 4a and 4b • Stage 2?

APPENDIX C

Mechanical Test Excavation Results

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
November 23	TS89;157	2	E-W	5.6	3.1	0 to 15	Asphalt	Two Layers
						15 to 35	Brown sand with abundant gravels and cobbles	Road Fill
						35 to 63 63 to 140	Two Layers: • Blue/grey clay with trace silt (disturbed sterile sediment) • Mottled light to medium brown silt with trace sand	Historic Fill
						140 to 180	Dark brown to black silt with trace sand and organics (disturbed)	Interpreted Original Surface
						180 to 195	Blue/grey clay with trace silt	Sterile Deposit
November 23	TS94;190	2	N-S	5.5	2.3	0 to 5	Asphalt	One Layer
						5 to 25	Brown sand with abundant gravels and cobbles	Road Fill
						25 to 65	Brown sand	Imported Fill
						65 to 140 140 to 210	Two Layers: • Mottled grey/brown sand with grey clayey silt • Mottled grey clayey silt with dark grey to black sand and abundant industrial waste	Historic Fill
						210 to 230	Mottled light brown and light grey clayey silt	Sterile Deposit
November 24	TS86;135	2	N-S	4.1	3.4	0 to 7	Asphalt	Two Layers
						7 to 25	Brown sand with abundant gravels and cobbles	Road Fill
						25 to 95	Two Layers: • Fire reddened, red/brown mottled with brown/grey silty sand • Concentrated to the north, mottled grey/brown sandy silt	Historic Fill
						95 to 142	Mottled light brown and light grey sandy silt	Sterile Deposit
November 24	TS88;83	2	N-S	4.5	2.0	0 to 9	Asphalt	Two Layers
						9 to 19	Brown sand with abundant gravels and cobbles	Road Fill
						19 to 150 150 to 180	Two Layers: • Mottled light brown with light grey clayey silt (transition from road fill to sterile deposit 19 to 40 cm includes trace sand) • Medium grey sandy silt	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
November 25	TN8;-112	3	N-S	3.7	2.6	0 to 8	Grass	Sod
						8 to 45	Grey sand	Imported Fill
						45 to 150	Mottled medium brown, light and dark grey sandy silt with concentrations of dark brown sandy silt	Historic Fill
						150 to 170	Mottled light brown and light grey clayey silt	Sterile Deposit
November 25	TN20;-100	3	N-S	3.0	2.3	0 to 6	Grass	Sod
						6 to 44	Grey sand	Imported Fill
						44 to 76 76 to 83 83 to 115	Three Layers: • Mottled grey and brown sandy silt • Light brown clayey silt • Brown sandy silt	Historic Fill
						115 to 120	Dark brown sandy silt with organics	Interpreted Original Surface
						120 to 194	Mottled light brown and light grey clayey silt	Sterile Sediment
November 28	TN32;-64	3	E-W	3.6	1.5	0 to 6	Grass	Sod
						6 to 58	Grey sand with a dark brown lens associated with organic sediment migration from sod	Imported Fill
						58 to 88 88 to 123 123 to 136	Two Layers and one concentration: • Mottled dark and medium brown sandy silt with orange/brown sand • Blue/grey clayey silt with mottled brown silt (disturbed sterile sediment) • Dark grey/brown clayey silt concentration	Historic Fill
						123 to 158	Dark brown to medium brown silty sand, with organics	Interpreted Original Surface
						158 to 175	Light brown mottled with orange sandy silt	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
November 28	TN28;-106	3	N-S	3.1	1.7	0 to 4	Grass	Sod
						4 to 58	Grey sand	Imported Fill
						58 to 80 80 to 88 88 to 162	Three Layers: • Mottled medium brown and dark grey sandy clay • Light brown sandy silt • Mottled dark brown and dark grey sandy silt	Historic Fill
						162 to 180	Mottled light brown and light grey clayey silt	Sterile Deposit
November 29	TN41;-80	3	N-S	3.3	1.5	0 to 8	Grass	Sod
						8 to 52	Grey sand	Imported Fill
						52 to 88 88 to 110	Two Layers: • Mottled dark grey sandy silt with light grey clayey silt and red/orange sand • Mottled blue/grey and light grey clayey silt (disturbed sterile deposit) with medium brown sandy silt	Historic Fill
						110 to 118	Dark brown silty sand with organics (disturbed)	Interpreted Original Surface
November 29	TN30;-43	3	N-S	2.8	2.0	0 to 5	Grass	Sod
						5 to 60	Grey sand	Imported Fill
						60 to 100 100 to 54 107 to 146	Two Layers and one concentration: • Mottled medium brown and orange/brown sandy silt • Blue/grey clayey silt (disturbed sterile sediment) • Medium brown silt concentration	Historic Fill
						100 to 170	Mottled dark brown and black silt with organics (disturbed)	Interpreted Original Surface
						170 to 240	Light brown mottled with orange sandy silt	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
November 30	TN14;-105	3	E-W	2.9	3.0	0 to 5	Asphalt	One Layer
						5 to 20	Brown sand mottled with grey sand with abundant gravels and cobbles	Road Fill
						20 to 48 48 to 210	Two Layers: • Medium brown silt with trace sand and clay • Grey sandy silt mottled with blue/grey and light grey clayey silt (disturbed sterile sediment) with a concentration of orange sandy silt	Historic Fill
						210 to 236	Blue/grey clayey silt	Sterile Deposit
November 30	TN19; -34	4a	N-S	3.5	2.3	0 to 5	Grass	Sod
						5 to 50	Grey sand	Imported Fill
						50 to 100 100 to 138	One Layer and one concentration: • Mottled medium brown and grey silty sand • Blue/grey clayey silt concentration (disturbed sterile deposit)	Historic Fill
						100 to 132	Dark brown sandy silt with organics (disturbed)	Interpreted Original Surface
						132 to 190	Mottled light brown and light grey silty sand	Sterile Deposit
December 1	TN5;-19	4a	E-W	3.1	2.6	0 to 7	Grass	Sod
						7 to 50	Grey sand	Imported Fill
						50 to 104	Medium brown sandy silt mottled with grey silty clay and dark brown sandy silt	Historic Fill
						104 to 145	Light brown mottled with orange silty sand	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
December 1	TN31;-15	4a	E-W	3.0	2.4	0 to 4	Grass	Sod
						4 to 49	Grey sand	Imported Fill
						49 to 80 80 to 104	Two Layers: • Mottled dark grey sandy silt with light brown sand and blue/grey clayey silt (disturbed sterile sediment) • Mottled blue/grey silty sand with orange/brown sand; dark grey silty sand; and mottled light brown and light grey clayey silt (disturbed sterile sediment)	Historic Fill
						104-127	Dark brown sandy silt mottled with medium brown sand and organics (disturbed)	Interpreted Original Surface
						127 to 155 155 to 160	Two Layers: • Orange/brown sand. • Light brown mottled with orange silty sand	Sterile Deposit
December 2	TN26;-8	4a	E-W	3.0	2.5	0 to 8	Grass	Sod
						8 to 50 50 to 58	Two Layers: • Grey sand • Grey sand with abundant gravels; associated with a pipe	Imported Fill
						58 to 100 100 to 150	Two Layers: • Mottled medium brown silty sand with grey silty clay • Mottled orange/brown silty sand with dark brown sandy silt	Historic Fill
						150 to 210	Light brown mottled with orange silty sand	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
December 2	TN36;-12	4a	E-W	4.1	2.5	0 to 8	Grass	Sod
						8 to 44	Grey sand.	Imported Fill
						44 to 76 76 to 117	Two Layers and one lens: • Mottled dark grey sandy silt with light brown clayey silt, blue/grey clayey silt with trace sand (disturbed sterile sediment); and orange/brown sand • Mottled light blue/grey clayey silt with trace sand (disturbed sterile sediment) with dark brown silt with organics (disturbed interpreted original surface) • Orange/brown sand ad dark brown/black sandy silt lens	Historic Fill
						117 to 148	Dark brown silt mottled with medium orang/brown sand with organics	Interpreted Original Surface
						148 to 208	Light brown mottled with orange sand	Sterile Deposit
December 5	TN27;-4	4a	E-W	4.1	3.5	0 to 8	Grass	Sod
						8 to 49	Grey sand	Imported Fill
						49 to 64 64 to 83	Two Layers: • Dark grey silt with trace clay and sand mottled with blue/grey clayey silt and light brown sandy silt • Light brown mottled with orange silty sand and mottled light grey and light brown clayey silt	Historic Fill
						83 to 87	Asphalt	One Layer
						87 to 94	Brown sand with abundant gravels and cobbles	Road Fill
						94 to 150	Orange/brown sand mottled with dark brown sandy silt and dark brown to black silty sand with organics (disturbed; interpreted original surface)	Historic Fill
						150 to 165	Light brown mottled with orange silty sand	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
December 5	TN13;-4	4a	N-S	2.0	2.0	0 to 7	Grass	Sod
						7 to 36	Grey sand	Imported Fill
						36 to 76	Mottled medium brown silty sand, orange/brown sand, and blue/grey clayey silt (disturbed, sterile sediment)	Historic Fill
						76 to 123	Dark and medium brown sandy silt (upper portion disturbed)	Interpreted Original Surface
						123 to 172	Mottled light brown with orange sand	Sterile Deposit
December 7	TS22;156	4b	N-S	2.9	2.2	0 to 8	Asphalt	Two layers
						8 to 28	Brown sand with abundant gravels and cobbles	Road Fill
						28 to 59 59 to 102	Two Layers: • Mottled light brown and light grey sandy silt, and brown sand • Medium grey silt with trace sand mottled with light brown silty sand and light grey sandy silt with trace clay	Sterile Deposit
December 7	TS27;147	4b	N-S	3.0	1.7	0 to 10	Asphalt	Two layers
						10 to 29 29 to 42	Two Layers: 1) Brown sand with abundant gravels and cobbles 2) Grey sand with abundant gravels and cobbles	Road Fill
						42 to 100 100 to 147	Two Layers: • Mottled light brown/grey silt with trace clay and sand; medium grey and light grey silt with trace clay and light brown sandy silt • Mottled light grey sand, light brown/grey and medium grey silty clay and light brown sand.	Sterile Deposit
December 8	TS79;46	4b	N-S	3.1	2.2	0 to 7	Asphalt	Two Layers
						7 to 20	Brown sand with abundant gravels and cobbles	Road Fill
						20 to 43	Orange/brown sandy silt	Historic Fill
						43 to 76 76 to 144	Two Layers: • Mottled light brown and light grey clayey silt • Medium grey silty sand	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
December 8	TS85;66	4b	N-S	3.2	2.0	0 to 12	Asphalt	Two Layers
						12 to 20	Brown sand with abundant gravels and cobbles	Road Fill
						20 to 137	Mottled medium brown silty sand with mottled light brown and light grey clayey silt (disturbed sterile sediment), associated with pipe	Historic Fill
						20 to 132 132 to 160	Two Layers: • Mottled light brown and light grey clayey silt • Medium grey sandy silt	Sterile Deposit
December 8	TS42;102	4b	E-W	3.0	2.0	0 to 10	Asphalt.	Two Layers
						10 to 30	Brown sand with abundant gravels and cobbles. Terminated due to clay drain tile pipe	Road Fill
December 8	TS79;52	4b	N-S	3.0	2.0	0 to 10	Asphalt	Two Layers
						10 to 20	Brown sand with abundant gravels and cobbles	Road Fill
						20 to 68 68 to 170	Two Layers: • Mottled light brown and light grey clayey silt • Medium grey silty sand	Sterile Deposit
December 12	TS22;6	4b	E-W	3.6	2.0	0 to 10	Asphalt	Two Layers
						10 to 40	Brown sand with abundant gravels and cobbles	Road Fill
						40 to 88	Medium brown silty sand	Historic Fill
						88 to 122	Dark brown sandy silt mottled with blue/grey clayey silt (disturbed sterile sediment)	Interpreted Original Surface
						122 to 151	Mottled light brown and light grey clayey silt	Sterile Deposit
December 12	TS51;31	4b	E-W	4.1	2.0	0 to 10	Asphalt	Two to Three Layers
						10 to 15	Brown sand with abundant gravels and cobbles	Road Fill
						10 to 71	Medium brown silt with trace sand	Historic Fill
						71 to 122	Mottled light brown and light grey clayey silt	Sterile Deposit

Date	Test ID	Stage	Orientation	Length (m)	Width (m)	Depth Below Surface (cm)	Observed Levels/Stratigraphy	Notes
December 12	TS7;11	4b	E-W	3.0	2.0	0 to 12	Asphalt	Two Layers
						12 to 34	Grey silty sand	Road Fill
						34 to 70 70 to 110	Two Layers: • Medium brown silt • Orange/brown sand	Historic Fill
						110 to 170	Blue/grey clayey silt	Sterile Deposit
December 12	TS85;34	4b	N-S	3.0	2.0	0 to 12	Asphalt.	Two Layers
						12 to 25	Brown sand with abundant gravels and cobbles	Road Fill
						25 to 110	Mottled light brown and light grey clayey silt	Sterile Deposit
December 13	TS31;47	4b	E-W	3.0	2.1	0 to 15	Asphalt	Two Layers
						15 to 22	Brown sand with abundant gravels and cobbles	Road Fill
						18 to 84	Medium brown sandy silt; associated with a trench	Historic Fill
						22 to 88	Mottled light brown and light grey clayey silt	Sterile Deposit
December 13	TS68;44	4b	N-S	4.0	2.0	0 to 10	Asphalt	Two Layers
						10 to 22	Medium brown sand with abundant gravels and cobbles	Road Fill
						22 to 42	Mottled orange/brown and dark brown sandy silt	Historic Fill
						42 to 70 70 to 115	Two Layers: • Mottled light brown and light grey clayey silt • Medium grey sandy silt	Sterile Deposit
December 13	TS8;25	4b	N-S	2.8	2.0	0 to 12	Asphalt	Two Layers
						12 to 26	Brown sand with abundant gravels and cobbles	Road Fill
						26 to 72	Mottled dark brown and orange/brown silty sand	Historic Fill
						72 to 140	Mottled light brown and light grey clayey silt	Sterile Deposit
December 13	TS30;30	4b	E-W	3.0	2.0	0 to 12	Asphalt	Two Layers
						12 to 26	Brown sand with abundant gravels and cobbles	Road Fill
						26 to 70	Orange/brown sandy silt	Historic Fill
						70 to 160	Mottled light brown and light grey clayey silt	Sterile Deposit

APPENDIX D

Historic Artifact Analysis Results

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 23/ 16	TS 89; 157	2	1	N/A	35-140	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	Unknown	Complete	No	No	cf. cervical vertebra; atlas. Articular cortical and cancellous bone.
Nov 23/ 16	TS 89; 157	2	1	N/A	35-140	Metal	Alloy	Unknown	Unknown	Unknown	Complete	N/A	N/A	N/A	N/A	N/A	Heavy weight; possible toggel button.
Nov 24/ 16	TS 86; 135	2	1	N/A	15-100	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Green pattern; transfer paint; refit of two; rim and base fragments.
Nov 24/ 16	TS 86; 135	2	1	N/A	15-100	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	White; refit of four; base and body fragments.
Nov 24/ 16	TS 86; 135	2	1	N/A	15-100	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	White; rim fragment.
Nov 24/ 16	TS 86; 135	2	1	N/A	15-100	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Blue; transfer paint; flat; likely plate.
Nov 24/16	TS 86; 135	2	1	N/A	50-60	Composite Object	Enamel on Tin	Personal/societal	Sanitary product	Bowl	Complete	N/A	N/A	N/A	N/A	N/A	Blue; swirl and splatter pattern; basin.
Nov 24/16	TS 86; 135	2	7	N/A	40	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Two and six pieces refit; 13 pieces total. Blue pattern; "Made in Japan" mark; possibly hand painted; base fragment. In situ.
Nov 23/ 16	TS 94; 190	2	2	N/A	130	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue and black pattern; transfer paint; rim and base fragment. One blue pattern; transfer paint; rim fragment. In situ.
Nov 23/ 16	TS 94; 190	2	1	N/A	65-140	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; base fragment; possible cup/mug or bowl.
Nov 23/ 16	TS 94; 190	2	1	N/A	65-140	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Brown, black and grey pattern; transfer paint; rim fragment.
Nov 23/ 16	TS 94; 190	2	1	N/A	65-140	Ceramic	Earthenware	Food/beverage	Food Container	Crock	Fragment	N/A	N/A	N/A	N/A	N/A	Glaze; light brown; base fragment.
Nov 25/ 16	TN 20; -100	3	N/A	1	50-175	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	Distal Radius	Complete	No	No	Confer (cf). bovids. Articular cortical and cancellous bone.
Nov 25/ 16	TN 20; -100	3	1	N/A	50-175	Glass	Glass	Cosmetic/Drug	Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	White; machine; rim fragment.
Nov 25/ 16	TN 20; -100	3	1	N/A	50-175	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; machine; rim fragment.
Nov 25/ 16	TN 20; -100	3	1	N/A	50-175	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"5", "7822", and "Canada"; clear/colourless; base fragment.
Nov 25/ 16	TN 20; -100	3	2	N/A	50-175	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One cream glaze; grey and purple pattern; possible saucer; rim and base fragment. One white; smaller plate; rim and base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Earthenware	Structural	Building Component	Pipe	Fragment	N/A	N/A	N/A	N/A	N/A	Drainage pipe.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Redware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Glazed; exterior surface light and dark brown; interior surface dark brown; body fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Earthenware	Food/beverage	Food Container	Crock	Fragment	N/A	N/A	N/A	N/A	N/A	Glazed; yellow; rim and partial neck fragment. Linear imprints along rim.
Nov 25/ 16	TN 8; -112	3	4	N/A	45-150	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	One pink; body fragment with broken handle. One orange and gold pattern; hand painted; rim fragment. One white; rim fragment. One blue pattern; transfer print; rim fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Refined white earthenware	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	Green and yellow pattern; transfer print; body fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Porcelain	Structural	Building Component	Insulator	Fragment	N/A	N/A	N/A	N/A	N/A	Possible industrial insulator.
Nov 25/ 16	TN 8; -112	3	3	N/A	45-150	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One orange, yellow, and gold pattern; hand paint; rim fragment. One orange ombre with embossing; body fragment. One blue pattern; hand paint; rim fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One pink (spunge affect), blue, and black (transfer paint); base fragment. "ATL" and "Ston" makers mark.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 25/ 16	TN 8; -112	3	6	N/A	45-150	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue pattern; transfer paint; rim fragment. One blue pattern; transfer paint; rim and base fragment; large plate. One gold; base fragment; small plate. One pink, green, and blue pattern; transfer print; base fragment; thick plate. One gold; hand paint; base fragment. One white; base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"Diamond-D", "4", "1322L W.S", and "Made in Canada"; refit of two; base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Crest, crown, "D", "C", "co", and "Company"; body fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"r. J.O.L"; possible shoulder or base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	"KERR GLASS MFG CO", "SAND SPRINGS OKLA", "PAT JUNE 9 1903", "3", and "."; base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Ceramic	Porcelain	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; possible light fixture or candy dish.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Cosmetic/Drug	Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	White; base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Green tint; machine; floral (possible thistle) embossing; possible vase or bottle.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Composite Object	Glass and cork	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; machine; rim and neck with cork.
Nov 25/ 16	TN 8; -112	3	2	N/A	45-150	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	One clear/colourless; base fragment. One "3994" and "1"; clear/colourless; base and body fragment; rectangular.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	"2" or "S" in circle; clear/colourless; base fragment.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; machine; body fragment; angular.
Nov 25/ 16	TN 8; -112	3	1	N/A	45-150	Glass	Glass	Structural	Hardware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Blue; possible electrical insulator; appears melted.
Nov 28/ 16	TN 32; -64	3	1	N/A	50-132	Metal	Alloy	Structural	Building Component	Nail	Complete	N/A	N/A	N/A	N/A	N/A	Wire drawn.
Nov 28/ 16	TN 32; -64	3	1	N/A	50-132	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Blue pattern; transfer paint; base fragment.
Nov 28/ 16	TN 32; -64	3	2	N/A	50-132	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One white; rim fragment. One grey, green, and red pattern; transfer paint; rim fragment.
Nov 28/ 16	TN 32; -64	3	1	N/A	50-132	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; very small fragment.
Nov 28/ 16	TN 32; -64	3	1	N/A	50-132	Glass	Glass	Food/beverage	Food Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; body fragment.
Nov 28/ 16	TN 32; -64	3	1	N/A	50-132	Glass	Glass	Structural	Hardware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; possible insulator.
Nov 28/ 16	TN 28; -106	3	N/A	5	58-162	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	Unknown	N/A	Yes	No	Calcined cortical and cancellous bone.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, large	Axial	N/A	No	Yes	cf. innominant or scapula. Articular cortical bone. Saw cut mark consistent with butchery practises.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Triangle makers mark and "1"; clear/colourless; base fragment.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Blue tint; refit of two; base fragment.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Metal	Copper	Unknown	Unknown	Unknown	Complete	N/A	N/A	N/A	N/A	N/A	Plate; possibly from a clock or toaster.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Ceramic	Earthenware	Food/beverage	Food Container	Crock	Fragment	N/A	N/A	N/A	N/A	N/A	Cream glaze; base fragment.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Ceramic	Porcelain	Food/beverage	Food Container	Lid/Tureen	Fragment	N/A	N/A	N/A	N/A	N/A	White; rim and body fragment.
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	White; refit of two; base fragment.
Nov 28/ 16	TN 28; -106	3	3	N/A	58-162	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue pattern; transfer paint; base fragment. One blue pattern; transfer paint; likely base fragment (flat). One white; base fragment.
Nov 28/ 16	TN 28; -106	3	2	N/A	58-162	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	Two white; base fragments.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 28/ 16	TN 28; -106	3	1	N/A	58-162	Ceramic	Porcelain	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; thick fragment; possible plate or industrial material.
Nov 29/ 16	TN 30; -43	3	1	N/A	150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Green tint; posibbly blown (uneven thickness and air pockets); body fragment. In situ.
Nov 29/ 16	TN 30; -43	3	1	N/A	150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"Orange Crush 6 FL OZ", "Rec'd Aug 22, 1921 Orange Crush Bottle", "Diamond-D", and "6"; clear/pearlescent; machine. In situ.
Nov 29/ 16	TN 41; -80	3	N/A	1	50-125	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	Unknown	N/A	Yes	No	Calcined cortical bone.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Ceramic	Earthenware	Structural	Building Component	Pipe	Fragment	N/A	N/A	N/A	N/A	N/A	"IND LTD_ CANADA"; drainage pipe fragment.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Metal	Alloy	Structural	Building Component	Nail	Complete	N/A	N/A	N/A	N/A	N/A	Wire drawn.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Textile	Leather	Personal/societal	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Dark brown; rectangular strip; possible shoe leather; two rivet holes on one end; similar to shoelace holes.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"Made In", "Diamond-D", and "0"; brown; refit of two; body and base fragment.
Nov 29/ 16	TN 41; -80	3	2	N/A	50-125	Glass	Glass	Unknown	Unknown	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	One cloudy/colourless; machine; body fragment. One "3"; clear/ colourless; body fragment.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Glass	Glass	Structural	Building Component	Window Pan	Fragment	N/A	N/A	N/A	N/A	N/A	Green tint; single pan; rectangular shape.
Nov 29/ 16	TN 41; -80	3	2	N/A	50-125	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	Two white; base fragments.
Nov 29/ 16	TN 41; -80	3	2	N/A	50-125	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Two white; base fragments.
Nov 29/ 16	TN 41; -80	3	1	N/A	50-125	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Green pattern; transfer paint; refit of two; rim fragment.
Nov 29/ 16	TN 41; -80	3	3	N/A	50-125	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One pearlescent/white pattern; transfer paint; rim fragment. Two white; rim fragments.
Nov 29/ 16	TN 41; -80	3	2	N/A	50-125	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Two white; body fragments.
Nov 29/ 16	TN 41; -80	3	4	N/A	50-125	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Two white; body fragments. One white; body fragment; one base ridge. One white; body fragment; two base ridges.
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Aluminum	Food/beverage	Food Container	Can	Complete	N/A	N/A	N/A	N/A	N/A	"Puritan meat balls in gravy", "By Grant and Mann Vancouver, BC Canada", and "Canada Approved Est. 34".
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Iron	Personal/societal	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible coal pan or bed warmer. Likely had wooden handle attachement.
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Unknown	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible cap to container or equipment/machinery.
Nov 30/16	TN -14; -105	3	4	N/A	48-210	Metal	Alloy	Structural	Hardware	Nail	Complete	N/A	N/A	N/A	N/A	N/A	Wire drawn.
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Alloy	Structural	Hardware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible nail. High iron content.
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Iron	Structural	Hardware	Bolt	Complete	N/A	N/A	N/A	N/A	N/A	Nut and bolt; large.
Nov 30/16	TN -14; -105	3	1	N/A	48-210	Metal	Copper	Structural	Hardware	Threaded pipe fitting	Complete	N/A	N/A	N/A	N/A	N/A	Threaded pipe fitting with gasket.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Textile	Leather	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible side of shoe. Small diamond imprints.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Metal	Alloy	Structural	Hardware	Nail	Complete	N/A	N/A	N/A	N/A	N/A	Wire drawn. High iron content.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Metal	Alloy	Structural	Hardware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible handle with two holes for attachment. Likely stainless steal.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Glass	Glass	Food/beverage	Food Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; machine; neck, rim, and partial shoulder fragment.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	Blue tint; machine; rim fragment.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Ceramic	Earthenware	Food/beverage	Food Container	Crock	Fragment	N/A	N/A	N/A	N/A	N/A	Cream; base fragment.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 30/16	TN -14; -105	3	2	N/A	20-48	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue pattern; rim fragment. One brown and green pattern; base fragment.
Nov 30/16	TN -14; -105	3	1	N/A	20-48	Ceramic	Refined white earthenware	Food/beverage	Tableware	Cup/mug	Fragment	N/A	N/A	N/A	N/A	N/A	White; rim and body fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Beverage Container	Bottle	Complete	N/A	N/A	N/A	N/A	N/A	Green; machine; glue residue from label.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Bottle	Complete	N/A	N/A	N/A	N/A	N/A	Brown; machine; possible roman numeral "II" on base.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Jar	Complete	N/A	N/A	N/A	N/A	N/A	White; machine; parallel striations on opposing sides. Cold cream.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	Blue; double nested triangle on base; machine; minor break on rim. Vicks Vapour Rub.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	"MENTH", "REG. TRADE MARK", and "M"; white, base and body fragment (coarse grain). Mentholatum Ointment from Mentholatum Company.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	"WHITEHALL PHARMACAL CO. INC."; white; refit of 10; base and body fragment. Whitehall Pharmacal Company Rowles Mentho-Sulphur Compound.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"11"; brown/clear; machine; base and body fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Single triangle on base; green/clear; machine; base fragment.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Glass	Glass	Food/beverage	Food Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"H.J. Heinz CO. 132 PAT D.", "132", and six dots; clear/pearlescent; machine; base and body fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"4"; clear/pearlescent; base fragment. Three striations on opposing sides on body.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	"41"; clear/colourless; base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; parallel striations; base and body fragment. Melted from heat.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Tableware	Cup/mug	Fragment	N/A	N/A	N/A	N/A	N/A	White; machine; base, body, and handle fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Food Container	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/pearlescent; base fragment; possible Jar.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Brown; concave base fragment; possible wine bottle.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Furniture	Decorative Accent	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Green/clear; possibly hand blown; neck fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	Light blue/clear; machine; rim and shoulder fragment.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Textile	Leather	Personal/societal	Clothing/footwear	Shoe	Fragment	N/A	N/A	N/A	N/A	N/A	Complete sole and heel fragment.
Nov 30/ 16	TN -14; -105	3	N/A	2	48-210	Faunal	Shell	N/A	N/A	N/A	Fragment	Saxidomus gigantea (Butter Clam)	Margin	N/A	No	No	Natural.
Nov 30/ 16	TN -14; -105	3	N/A	3	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	N/A	N/A	Yes	No	Calcined cortical bone.
Nov 30/ 16	TN -14; -105	3	N/A	1	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	N/A	N/A	No	No	Cancellous bone.
Nov 30/ 16	TN -14; -105	3	N/A	3	48-210	Faunal	Connective Tissue - apidocere	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	N/A	N/A	No	No	Two pieces of hair embedded in the connective tissue.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 30/ 16	TN -14; -105	3	N/A	1	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	Iliac	Complete	No	Yes	Cortical and cancellous bone. Saw cut mark consistent with butchery practices.
Nov 30/ 16	TN -14; -105	3	N/A	1	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	Patella	N/A	No	No	Articular cortical and cancellous bone.
Nov 30/ 16	TN -14; -105	3	N/A	1	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	Unknown	N/A	No	No	Articular cortical and cancellous bone. Appears to have been mineralized; rock fragments adhered to bone.
Nov 30/ 16	TN -14; -105	3	N/A	3	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Mammalia, medium to large	Rib	N/A	No	Yes	Cortical and cancellous bone. Refit of two. Large piece saw cut on both ends, with minor cuts on body. Cut marks consistent with butchery practices.
Nov 30/ 16	TN -14; -105	3	N/A	1	48-210	Faunal	Bone	N/A	N/A	N/A	Fragment	Artiodactyla, medium to large	Femur	Incomplete	No	Yes	cf. right bos. Articular cortical and cancellous bone. Refit of two. Unfused along epiphyseal plate. Saw cut marks, with blue discolouration, consistent with butchery practices.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Three small blue painted triangles arranged in a triangle and "625" imprint makers mark; white; possible hand print; base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	"JOHNSON BROS ENGLAND" imprint makers mark; white; refit of two; base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	"M" surrounded by laurel wreath above "MADE IN JAPAN" makers mark; blue; transfer paint; base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	"BOOTHS", "SILICON", "EN", and crown makers mark; red; transfer paint; possible plate or cup base.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	"LL" and "ND" makers mark; green; transfer paint; two embossed ridges on base.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Serving ware	Fragment	N/A	N/A	N/A	N/A	N/A	Blue pattern; transfer paint; rim and shoulder fragment; angular shaped.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Cup/mug	Fragment	N/A	N/A	N/A	N/A	N/A	Blue; transfer paint; body and inferior handle fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Blue pattern; transfer paint; refit of two; lip fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Earthenware	Food/beverage	Food Container	Crock	Fragment	N/A	N/A	N/A	N/A	N/A	Glazed; brown; base and body fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Bowl	Fragment	N/A	N/A	N/A	N/A	N/A	Blue pattern; transfer paint; refit of three; body fragment. One encircling embossed striation.
Nov 30/ 16	TN -14; -105	3	5	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Two flat fragments; one blue pattern; transfer paint. Three curved fragments; one blue, pink, and gold pattern; transfer paint; and one grey possible pattern. Remaining white fragments.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Pink, green, and yellow pattern; transfer paint; two embossed dots; curved with possible base at end of pattern.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	One white; base fragment. One white; body and base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Bowl	Fragment	N/A	N/A	N/A	N/A	N/A	White; base fragment.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Cup/mug	Fragment	N/A	N/A	N/A	N/A	N/A	One faded blue and brown; rim and body fragment. One gold; transfer paint; rim fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	Gold pattern; transfer paint; interior surface and light brown, dark brown, blue, gold, and black pattern; transfer paint; exterior surface; rim and body fragment.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 30/ 16	TN -14; -105	3	3	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	One gold, green, and pink pattern; transfer paint; rim fragment. One gold, blue, and grey pattern; transfer paint; rim and body fragment. One; refit of two; blue, pink, green, and brown pattern; transfer paint; rim and body fragment.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	One gold; transfer paint; body fragment. One orange and black pattern; transfer paint; body fragment; possible cup/mug or bowl fragments.
Nov 30/ 16	TN -14; -105	3	3	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One gold; transfer paint; rim and base fragment; three embossed lines on base (posterior side). One green, blue, gold, and brown pattern; transfer paint; rim and base fragment; three embossed lines on base (posterior side). One; refit of three; pink, green, yellow, purple, and grey pattern; transfer paint; rim and base fragment.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue and yellow pattern; transfer paint; rim and base fragment; possible saucer.
Nov 30/ 16	TN -14; -105	3	6	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One white; base fragment. One brown pattern; transfer paint; base fragment. One orange, purple, and green pattern; transfer paint; base fragment. One pink, yellow, and green pattern; transfer paint; base and body fragment. One pink, green, blue, and brown pattern; transfer paint; base fragment. One red and green pattern; transfer paint; base fragment.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One burnt; base fragment. One blue pattern; transfer paint; base and body fragment.
Nov 30/ 16	TN -14; -105	3	8	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One red, yellow, blue, light brown, black, grey, and gold pattern; transfer paint; rim fragment. One faded gold and blue pattern; transfer paint; rim fragment; parallel, wavy striations. One gold and grey pattern; transfer paint; rim and body fragment. One pink, blue, green, grey, black, and gold pattern; transfer paint; rim and body fragment. One blue and gold pattern; transfer paint; rim and body fragment. One pink, green, gold, and yellow pattern; transfer paint; rim and body fragment. One green, pink, and yellow pattern; transfer paint; rim and body fragment. One red, pink, green, and yellow pattern; transfer paint; rim and body fragment.
Nov 30/ 16	TN -14; -105	3	4	N/A	48-210	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One pink, blue, green, and orange pattern; transfer paint; rim fragment with latticed detail. One white; rim fragment. One faded pink, white, and gold pattern; transfer paint; rim and body fragment; embossed pattern and patterned rim. One green and gold pattern; transfer paint; rim and body fragment; scalloped rim.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Green and gold pattern; transfer paint; rim fragment; possible saucer or bowl.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Earthenware	Structural	Building Component	Sconce	Fragment	N/A	N/A	N/A	N/A	N/A	Cream; embossed floral pattern; threaded fixture.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Earthenware	Structural	Building Component	Tile	Fragment	N/A	N/A	N/A	N/A	N/A	"BRU", "N", and "ACKF" makers mark; glazed; grey matte finish exterior surface; square corner edges.
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Ceramic	Earthenware	Structural	Building Component	Tile	Fragment	N/A	N/A	N/A	N/A	N/A	Glazed; exterior surface; cream; concaved tile.
Nov 30/ 16	TN -14; -105	3	2	N/A	48-210	Ceramic	Earthenware	Structural	Building Component	Tile	Fragment	N/A	N/A	N/A	N/A	N/A	One; refit of two; glazed exterior surface; blue, green, yellow, and brown pattern; transfer paint; corner tile. One pink; tile.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Nov 30/ 16	TN -14; -105	3	1	N/A	48-210	Composite Object	Porcelain and copper.	Structural	Building Component	Insulator	Fragment	N/A	N/A	N/A	N/A	N/A	Insulator with copper screw threads and electrical foot contact.
Nov 30/ 16	TN -14; -105	3	5	N/A	48-210	Ceramic	Porcelain	Structural	Building Component	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Industrial, possibly related to electrical insulation. One piece contains part of an embossed crown.
Dec 2/ 16	TN 36; -12	4a	1	N/A	47-76	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; body fragment.
Dec 2/ 16	TN 36; -12	4a	1	N/A	47-76	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Green pattern; transfer paint; embossed; body fragment.
Dec 2/ 16	TN 36; -12	4a	1	N/A	47-76	Ceramic	Earthenware	Food/beverage	Food Container	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Glazed; one side white; rim fragment.
Dec 2/ 16	TN 36; -12	4a	1	N/A	47-76	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Brown and pink pattern; transfer paint; rim and base fragment.
Dec 2/ 16	TN 36; -12	4a	1	N/A	47-76	Ceramic	Earthenware	Structural	Building Component	Pipe	Fragment	N/A	N/A	N/A	N/A	N/A	"LOX IND LTD C"; drainage pipe fragment.
Dec 2/ 16	TN 36; -12	4a	1	N/A	76-148	Wood	Wood	Structural	Building Component	Beam	Fragment	N/A	N/A	N/A	N/A	N/A	End of a planed beam; opposing end on one side, circular cut.
Dec 5/ 16	TN 27; -4	4a	1	N/A	100-110	Glass	Glass	Food/beverage	Beverage Container	Bottle	Complete	N/A	N/A	N/A	N/A	N/A	"L & C℄L° C" and "512LH2"; clear/pearlescent; shattered during excavation; refit of 52.
Dec 5/ 16	TN 27; -4	4a	1	N/A	50-100	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"BY DISTILLE" and "LIMIT"; clear/colourless; base and body fragment.
Dec 5/ 16	TN 27; -4	4a	7	N/A	50-100	Glass	Glass	Structural	Building Component	Window Pan	Fragment	N/A	N/A	N/A	N/A	N/A	Five clear/colourless; small fragments. Two green tint; large fragments. All single pan.
Dec 5/ 16	TN 27; -4	4a	1	N/A	50-100	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	White; rim fragment.
Dec 5/ 16	TN 27; -4	4a	1	N/A	50-100	Ceramic	Earthenware	Structural	Building Component	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Red; possible pipe fragment.
Dec 5/ 16	TN 27; -4	4a	5	N/A	110-120	Textile	Rubber	Tools/equipment	Hardware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Black; red paint on exterior surface; possible garden hoes.
Dec 5/ 16	TN 27; -4	4a		N/A	50-100	Composite Object	Asphalt/Tar	Structural	Building Component	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible roofing shingles.
Nov 30/ 16	TN 19; -34	4a	1	N/A	50-100	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"Made in Canada", "7822 B", "6", "A", "Diamond-D", and "2"; clear/colourless; base fragment.
Nov 30/ 16	TN 19; -34	4a	1	N/A	50-100	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"TILLER", "1", and " Diamond-D"; clear/colourless; base fragment.
Nov 30/ 16	TN 19; -34	4a	1	N/A	50-100	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; refit of two; rim, neck, partial shoulder, and body fragment; flat portion for label and ribbed decoractive embossing.
Nov 30/ 16	TN 19; -34	4a	1	N/A	50-100	Glass	Glass	Unknown	Unknown	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; body fragment.
Nov 30/ 16	TN 19; -34	4a	1	N/A	50-100	Glass	Glass	Cosmetic/Drug	Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Clear/colourless; rim, neck, and partial shoulder fragment.
Dec 1/ 16	TN 31; -15	4a	1	N/A	79-102	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"Canada", "D" or "." in diamond, and "9"; clear/colourless; almost complete bottle with exception of portion of base.
Dec 1/ 16	TN 31; -15	4a	2	N/A	50-79	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	One "SPR" and "Patent"; clear/colourless; base fragment. One clear/colourless; base fragment (small fragment; possibly not a jar).
Dec 1/ 16	TN 31; -15	4a	2	N/A	79-102	Composite Object	Lead and plastic	Structural	Building Component	Pipe and spigot/plug	Fragment	N/A	N/A	N/A	N/A	N/A	Medium diameter pipe with plug (metal cap on one end, two holes on opposite end); possible electrical conduit.
Dec 1/ 16	TN 31; -15	4a	13	N/A	79-102	Composite Object	Asphalt/Tar	Structural	Building Component	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Possible roofing shingles.
Dec 2/ 16	TN 26; -8	4a	1	N/A	80	Glass	Glass	Food/beverage	Food Container	Jar	Fragment	N/A	N/A	N/A	N/A	N/A	"F", "3", ".", and "Diamond-D"; clear/colourless; refit of two; base fragment. In situ.
Dec 2/ 16	TN 26; -8	4a	1	N/A	120	Composite Object	Enamel on Tin	Food/beverage	Beverage Container	Cup/mug	Complete	N/A	N/A	N/A	N/A	N/A	White; body fragment with blue handle; transfer paint. In situ.

Date	Provenience	Stage	Historic Count	Faunal Count	DBS	Material 1	Material 2	Function 1	Function 2	Object	Completeness	Taxon	Element	Fusion	Burned	Cut Marks	Comments
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Faunal	Bone	Personal/societal	Unknown	Unknown	Fragment	Unknown	Unknown	N/A	No	Yes	Possible incised bone or clay; decorative item.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Metal	Alloy	Structural	Building Component	Nail	Complete	N/A	N/A	N/A	N/A	N/A	Wire drawn.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Metal	Alloy	Unknown	Unknown	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Folded metal fragment; likely structural.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	"United Distiller Limited F", "Vancouver Canada", "6", and "Diamond D"; clear/colourless; base fragment.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Glass	Glass	Food/beverage	Beverage Container	Bottle	Fragment	N/A	N/A	N/A	N/A	N/A	Brown; body fragment.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Green pattern; transfer paint; base fragment.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Ceramic	Earthenware	Structural	Building Component	Pipe	Fragment	N/A	N/A	N/A	N/A	N/A	"D. Canada"; brown; drainage pipe.
Dec 2/ 16	TN 26; -8	4a	1	N/A	58-150	Ceramic	Earthenware	Structural	Building Component	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Red; structural fragment.
Dec 13/ 16	TS 8; 25	4b	1	N/A	25-55	Glass	Glass	Furnishing	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	Light green and white ombre; rim fragment; possibly a vase or candy dish.
Dec 11/ 16	TS 7; 11	4b	1	N/A	25-73	Ceramic	Refined white earthenware	Food/beverage	Tableware	Teacup	Fragment	N/A	N/A	N/A	N/A	N/A	Blue pattern; transfer paint; rim fragment
Dec 11/ 16	TS 7; 11	4b	1	N/A	25-73	Ceramic	Porcelain	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	One pink spunge pattern; body fragment; possible cup/mug or bowl. One gold pattern; transfer print; rim fragment.
Dec 11/ 16	TS 7; 11	4b	2	N/A	25-73	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One white; base fragment. One blue pattern; base fragment.
Dec 12/ 16	TS 22; 6	4b	2	N/A	40-80	Ceramic	Refined white earthenware	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	One blue; embossed; transfer paint; rim fragment. One white; embossed; rim and body fragment.
Dec 12/ 16	TS 22; 6	4b	2	N/A	40-80	Ceramic	Refined white earthenware	Food/beverage	Tableware	Unknown	Fragment	N/A	N/A	N/A	N/A	N/A	White; body fragments.
Dec 12/ 16	TS 22; 6	4b	1	N/A	40-80	Ceramic	Porcelain	Food/beverage	Tableware	Plate	Fragment	N/A	N/A	N/A	N/A	N/A	Red, blue, and green pattern; transfer paint; rim fragment.

APPENDIX E

Ground-truthed Geophysical Anomalies

APPENDIX E
Ground-truthed Geophysical Anomalies

Date	Test ID	Stage	Anomaly ID	Geophysical Description	Inferred Depth Below Surface (m)	Observed Depth Below Surface (m)	Excavated Depth (m)[1]	Notes
November 23	TS89;157	2	88.47; 156.76	Primary; Subtle	< 1.50	1.40 to 1.80	1.95	Burned tree
			90.06; 157.41	Primary; Strong	< 1.50	Unknown		Anomaly not observed
			86.50; 156.17	Alternate; Strong	0.50 to 1.50	Unknown		Anomaly not observed.
November 23	TS94; 190	2	93.95; 189.92	Primary; Strong	~1.30 to 2.00	1.40 to 1.80	2.30	Concrete slab (1.5 to 1.63 m) and metal debris
			94.34; 192.83	Alternate; Subtle; Possible Metal	< 1.50	1.60 – 1.80		Metal sheet and tree trunk
November 24	TS86; 135	2	85.56; 135.20	Primary; Strong; Metallic	1.20 to 1.90	~0.60	1.42	Anomaly not observed; possible horseshoe
			86.58; 135.57	Primary; Subtle	< 1.50	0.50 to 1.42		Large boulder
			84.67; 134.79	Alternate; Strong; Metallic	1.10 to 2.20	0.50 to 0.60		Enamel coated, metal basin
November 24	TS88; 83	2	88.00; 83.40	Primary; Strong	< 1.50	Unknown	1.80	Anomaly not observed
			88.05; 81.74	Primary; Subtle	< 1.50	0.25 to 0.55		Small boulder
November 25	TN8; -112	3	7.53; -111.00	Primary; Strong	0.80	0.90	1.70	White PVC drain pipe
			7.53; -112.00	Primary; Strong	0.80	0.90		White PVC drain pipe
November 25	TN20; -100	3	20.55; -99.74	Primary; Subtle	0.55 to 1.70	1.06 to 1.32	1.94	Concentration of cobbles
			20.20; -99.99	Primary; Subtle	0.55 to 1.70	1.06 to 1.32		Concentration of cobbles
			19.70; -101.00	Alternate; Strong	0.55 to 1.70	0.75		Sheet metal and rebar
November 28	TN32; -64	3	30.98; -63.73	Primary; Subtle	1.35	1.20 to 1.32	1.75	Cedar log, metal pipe, and wood planed beam
			32.07; -63.71	Primary; Subtle	1.25	0.50 to 0.55		White PVC drain pipe

[1] See Appendix C for corresponding excavation log.

Date	Test ID	Stage	Anomaly ID	Geophysical Description	Inferred Depth Below Surface (m)	Observed Depth Below Surface (m)	Excavated Depth (m)[1]	Notes
November 28	TN28; -106	3	28.05; -106.92	Primary; Subtle	~1.40	0.60 to 0.80	1.80	Cobble layer
			28.13; -105.14	Primary; Subtle	~1.40	Unknown		Anomaly not observed
November 29	TN41; -80	3	41.19; -80.36	Primary; Subtle	1.50 to 1.90	1.10 to 1.14	1.18	Planed wood beam
November 29	TN30; -43	3	30.01; -43.56	Primary; Subtle	< 1.50	0.10 to 0.20	2.40	Metal nail
			30.06; -42.52	Primary; Subtle	< 1.50	1.40		Small boulder
November 30	TN-14; -105	3	-14.30; -105.00	Primary; Strong	0.70 to 2.00	0.65	2.36	Wire wrapped, decayed wood-stave pipe
			-13.00; -105.00	Primary; Strong	0.70 to 2.00	1.27 to 1.38		Wood-stave pipe
November 30	TN19; -34	4a	19.40; -34.10	Primary; Strong	< 2.00	1.00	1.90	Concentration of clayey silt
			19.50; -33.00	Primary; Strong	< 2.00	0.22		Small boulder
December 1	TN5; -19	4a	5.00; -18.50	Primary; Possible Grave	1.30	0.60 to 0.70	1.45	White PVC drain pipe
December 1	TN31; -15	4a	30.00; -15.50	Primary; Possible Grave/Metallic	1.25	1.16 to 1.18	1.60	Metal pipe
			30.00; -14.50	Primary; Strong; Metallic	1.25	0.83 to 1.10		Small boulder
			31.10; -14.00	Primary; Strong; Metallic; Possible Infrastructure	< 1.50	0.78 and 0.86 to 0.92		Two copper wires and white PVC drain pipe
			31.10; -14.90	Primary; Strong; Metallic; Possible Infrastructure	< 1.50	0.10 to 0.53		White PVC sprinkler pipe and sprinkler head

Date	Test ID	Stage	Anomaly ID	Geophysical Description	Inferred Depth Below Surface (m)	Observed Depth Below Surface (m)	Excavated Depth (m)[1]	Notes
December 2	TN26; -8	4a	25.75; -7.50	Primary; Possible Grave; Metallic	1.90	Unknown	2.10	Anomaly not observed
			26.00; -8.40	Primary; Possible Grave; Metallic	1.00	Unknown		Anomaly not observed
December 2	TN36; -12	4a	36.40; -11.50	Primary; Possible Grave	2.90	0.56 to 0.66	2.08	White PVC drain pipe. No disturbance observed in sterile sediment at base of test
			38.60; -11.50	Alternate; Possible Grave	3.00	0.56 to 0.66		White PVC drain pipe. No disturbance observed in sterile sediment at base of test
December 5	TN27; -4	4a	25.70 – 27.20; -2.20 – -5.90	Primary; Strong; Possible Infrastructure; Rectangular Area	1.40 to 1.50	0.50 and 1.30	1.65	White PVC drain pipe, E-W, at 0.50 to 0.54 m along the south edge; asphalt layer within the north half at 0.58 to 0.62 m; and a metal water main, N-S, at 1.3 to 1.65 m
December 5	TN13; -4	4a	13.01; -3.54	Additional; Subtle	< 2.00	0.30 to 0.80	1.72	Cobble layer
			13.01; -4.50	Additional; Subtle	< 2.00	0.30 to 0.80		Cobble layer
December 7	TS22; 156	4b	22.00; 156.30	Primary; Possible Grave	0.80	Unknown	1.02	Possible small boulder at 0.43 to 0.86 m near south wall of unit ~1.2 m from target
December 7	TS27; 147	4b	26.60; 147.11	Alternate; Subtle	< 2.00	0.71 to 0.81	1.47	Large cobble
December 8	TS79; 46	4b	78.50; 46.10	Primary; Strong	1.40	Unknown	1.44	Anomaly not observed
December 8	TS85; 66	4b	84.90; 65.90	Primary; Strong	0.70 to 1.20	Unknown	1.60	Anomaly not observed
December 8	TS42; 102	4b	43.00; 102.00	Primary; Strong	0.50 to 1.30	0.35	0.30	Clay drain tile pipe
			41.90; 102.00	Primary; Strong	0.50 to 1.30	0.35		Clay drain tile pipe

Date	Test ID	Stage	Anomaly ID	Geophysical Description	Inferred Depth Below Surface (m)	Observed Depth Below Surface (m)	Excavated Depth (m)[1]	Notes
December 8	TS79; 52	4b	78.50; 51.50	Primary; Strong	1.50	0.90 to ~1.50	1.70	Large boulder (left *in situ*)
			79.00; 52.40	Primary; Strong	1.50	Unknown		Anomaly not observed
December 12	TS22; 6	4b	21.40; 6.00	Primary; Possible Grave	0.70	Unknown	1.51	Anomaly not observed
			23.00; 6.00	Primary; Possible Grave	0.70	Unknown		Anomaly not observed
December 12	TS51; 31	4b	50.37; 31.10	Primary; Strong	< 1.70	0.57 to 0.80	1.22	Small boulder
			52.54; 30.94	Primary; Strong	< 1.70	Unknown		Anomaly not observed
December 12	TS7; 11	4b	6.75; 10.50	Primary; Possible Grave	1.20	Unknown	1.70	Anomaly not observed
			7.98; 10.41	Primary; Strong	< 1.50	0.40		Metal fragment
December 12	TS85; 34	4b	85.05; 34.2 – 36.2	Primary; Subtle; Possible Debris Trench	0.50 to 1.20	0.65 to 0.75	1.10	Large cobble
December 13	TS31; 47	4b	30.44; 46.71	Primary; Subtle	0.40 to 0.50	0.80 to 0.90	0.88	Glazed clay sewer pipe
			31.91; 47.48	Primary; Subtle	0.50	0.30 to 0.60		Small boulder
December 13	TS68; 44	4b	68.30; 42.90	Primary; Strong	0.70 to 1.10	0.20 to 0.40	1.15	Small boulder
			68.50; 44.50	Primary; Strong	0.90 to 1.25	0.75 to 1.10		Small boulder
December 13	TS8; 25	4b	8.00; 24.80	Primary; Possible Grave	1.30	0.25	1.40	Large cobble
			8.00; 25.60	Primary; Possible Grave	1.60	0.80 to 1.10		Small boulder
December 13	TS30; 30	4b	30.46; 29.49	Primary; Possible Grave	1.20	Unknown	1.60	Anomaly not observed
			31.18; 29.68	Primary; Strong	1.00	0.25 to 0.55		Large cobble

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APPENDIX B

Archaeological Impact Assessment Interim Report (HCA 2016 377) for 2017 (Technical Memorandum). 11 October 2017

TECHNICAL MEMORANDUM

DATE 18 April 2018 **REFERENCE No.** 0714120151-614-TM-Rev0-16304

TO Mr. Pat Duncan
School District 40

CC Grant Lachmuch, Urban Systems; Nathan Salomon, Partnership BC

FROM Andrew Mason
Charles Moore

EMAIL amason@golder.com;
cmoore@golder.com

NEW WESTMINSTER SECONDARY SCHOOL SUBSURFACE INVESTIGATIONS MONITORED IN 2017 ARCHAEOLOGICAL IMPACT ASSESSMENT INTERIM REPORT (HCA PERMIT 2016-0377)

1.0 INTRODUCTION

At the request of School District No. 40, New Westminster (SD40), Golder Associates Ltd. (Golder) is providing supplemental geo-environmental investigation services with heritage monitoring to delineate soil contamination and confirm groundwater and vapour quality in support of the development of a new secondary school on SD40 property near the current site of New Westminster Secondary School (NWSS). This technical memorandum provides the results for the heritage monitoring component of the geo-environmental investigations completed between 21 March 2017 and 23 August 2017. This technical memorandum also serves as the second interim report produced for work conducted under *Heritage Conservation Act* (HCA) Permit 2016-0377, and presents all of the archaeological field work conducted under this permit in calendar year 2017.

The objectives of the geo-environmental study are to address data gaps identified during a review of previous environmental reports for the property and to meet application requirements for a Certificate of Compliance (CoC) from the BC Ministry of Environment (MoE). Heritage work included borehole and test pit monitoring within/adjacent to the area of archaeological site DhRr-233 for due diligence purposes to determine the presence/absence of human remains or evidence of cemetery use within the area being assessed (Figure 1). Select field photographs can be found in the attachment to this technical memorandum.

All subsurface work within the boundary of archaeological site DhRr-233 was conducted under the terms and conditions of HCA Permit 2016-0377. The work was also conducted under Seyem' Qwantlen Heritage Investigation Permit SQ 2017-43, Squamish Nation Archaeological Investigation Permit 16-0170, Stó:lō Heritage Investigation Permit 2016-143, and Tsleil-Waututh Nation Cultural Heritage Investigation Permit 2016-094. Golder also applied for a Musqueam Indian Band Agreement to Conduct Archaeological Research within Musqueam Traditional Lands, but have not received a permit at the time of writing. Representatives of the Kwantlen First Nation and Tsleil-Waututh Nation participated in field work.

2.0 RESULTS

The sections that follow summarize the heritage monitoring results for the supplemental geo-environmental investigation. Locations of the 57 geo-environmental tests monitored in 2017 are presented in Figure 1.

2.1 Hand Auger Boreholes

Golder archaeologists monitored 12 of the hand auger boreholes with negative results for human remains or historic materials associated with cemetery use (see Table 1 below). One of the hand auger boreholes was positive for historic material. The monitored auger boreholes were typically 0.5 cm in diameter and ranged between 0.2 m and 0.6 m in depth.

Table 1: Monitored Hand Auger Boreholes

Test ID	Termination Depth (m)	Human Remains	Historic Artifacts		Comments
			Historic	Faunal	
HA17-01	0.5	Negative	Negative	Negative	N/A
HA17-02	0.3	Negative	Negative	Negative	N/A
HA17-03	0.5	Negative	Negative	Negative	N/A
HA17-04	0.5	Negative	Negative	Negative	N/A
HA17-36	0.5	Negative	Negative	Negative	N/A
HA17-37	0.5	Negative	Negative	Negative	N/A
HA17-38	0.5	Negative	Negative	Negative	N/A
HA17-39	0.5	Negative	Negative	Negative	N/A
HA17-40	0.4	Negative	Negative	Negative	N/A
HA17-41	0.2	Negative	Negative	Negative	N/A
HA17-42	0.2	Negative	Negative	Negative	N/A
HA17-67	0.6	Negative	Positive	Negative	Fragment of glass, metal and charcoal

2.2 Boreholes

Golder archaeologists monitored 44 truck-mounted solid stem auger boreholes (typically six-inch or approximately 15 cm in diameter) with negative results for human remains or historic materials associated with cemetery use (see Table 2 below). Monitoring was not conducted below the glacial clay interface, typically occurring between 1 m and 3 m of depth. Sixteen of the monitored boreholes were positive for historic artifacts, including wood debris.

Table 2: Monitored Boreholes

Test ID	Termination Depth (m)	Human Remains	Historic Artifacts		Comments
			Historic	Faunal	
BH17-05	0.99	Negative	Positive	Negative	Fragment of terracotta pipe
BH17-06	0.99	Negative	Negative	Negative	N/A
BH17-07	1.52	Negative	Negative	Negative	N/A
BH17-08	3	Negative	Positive	Negative	Fragment of ceramic tableware
BH17-09	3	Negative	Negative	Negative	N/A

Test ID	Termination Depth (m)	Human Remains	Historic Artifacts		Comments
			Historic	Faunal	
BH17-10	3	Negative	Negative	Negative	N/A
BH17-11	2	Negative	Negative	Negative	N/A
BH17-12	1.5	Negative	Negative	Negative	N/A
BH17-13	1.5	Negative	Negative	Negative	N/A
BH17-14	1.5	Negative	Negative	Negative	N/A
BH17-15	1.5	Negative	Positive	Negative	Fragment of clear glass bottle
BH17-16	2.4	Negative	Negative	Negative	N/A
BH17-19	3	Negative	Positive	Negative	Wood debris
BH17-20	3	Negative	Positive	Negative	Fragment of glass bottle
BH17-21	2	Negative	Negative	Negative	N/A
BH17-22	4	Negative	Negative	Negative	N/A
VP17-23	3.9	Negative	Negative	Negative	N/A
BH17-27	4	Negative	Positive	Negative	Fragment of metal can
BH17-28	1.5	Negative	Negative	Negative	N/A
BH17-29	2.4	Negative	Negative	Negative	N/A
MW17-30	4.5	Negative	Positive	Negative	Fragment of brown glass bottle
MW17-31	13.5	Negative	Negative	Negative	N/A
MW17-32	4.5	Negative	Negative	Negative	N/A
MW17-33	4.5	Negative	Negative	Negative	N/A
BH17-44	2.7	Negative	Negative	Negative	N/A
BH17-45	3.0	Negative	Negative	Negative	N/A
BH17-46	4.5	Negative	Negative	Negative	N/A
BH17-47	3.0	Negative	Negative	Negative	N/A
MW17-48D	21.3	Negative	Positive	Negative	Fragment of brick
MW17-50D	13.7	Negative	Negative	Negative	N/A
MW17-50S	11.0	Negative	Negative	Negative	N/A
BH17-51	4.6	Negative	Negative	Negative	N/A
BH17-52	6.1	Negative	Positive	Negative	Wood debris
BH17-54	4.6	Negative	Positive	Negative	Wood debris
BH17-55	4.6	Negative	Positive	Negative	Wood debris
BH17-56	4.6	Negative	Positive	Negative	Wood debris
BH17-57	4.6	Negative	Positive	Negative	Wood debris
BH17-58	4.6	Negative	Positive	Negative	Wood debris
BH17-59	4.6	Negative	Positive	Negative	Wood debris
BH17-60	4.6	Negative	Positive	Negative	Fragment of glass, metal, brick, wire and wood debris
VP17-61	1.5	Negative	Negative	Negative	N/A
BH17-62	10.7	Negative	Negative	Negative	N/A

Test ID	Termination Depth (m)	Human Remains	Historic Artifacts		Comments
			Historic	Faunal	
BH17-63	9.1	Negative	Positive	Negative	Wood debris, charcoal fragment
BH17-64	10.7	Negative	Negative	Negative	N/A

2.3 Geo-environmental Test Pit Excavation

A single geo-environmental test pit measuring approximately 1.5 m by 2.8 m was excavated into a large spoil pile to evaluate soil contamination. Construction debris was observed throughout the test pit excavation to a depth of 1.5 m below surface (Figure 1).

Table 3: Monitored Geo-environmental Test Pit

Test ID	Termination Depth (m)	Human Remains	Historic Artifacts		Comments
			Historic	Faunal	
TP17-34	1.5	Negative	Negative	Negative	Contained cobble sized fragments of concrete

3.0 CLOSURE

This report was prepared for the exclusive use of SD40. Any use, reliance, or decisions made by third parties on the basis of this report are the sole responsibility of such third parties.

We trust the information contained in this report is sufficient for your present needs. Should you have any questions regarding the project, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

Reviewed by:

Charles Moore, MA, RPCA
Senior Archaeologist

Andrew Mason, MA, RPCA
Principal

CDM/ARM/nnv

Attachments: Figure 1 – Archaeological Monitoring of Geo-Environmental Tests Conducted 21 March to 23 August 2017
Attachment 1 – Selected Photographs

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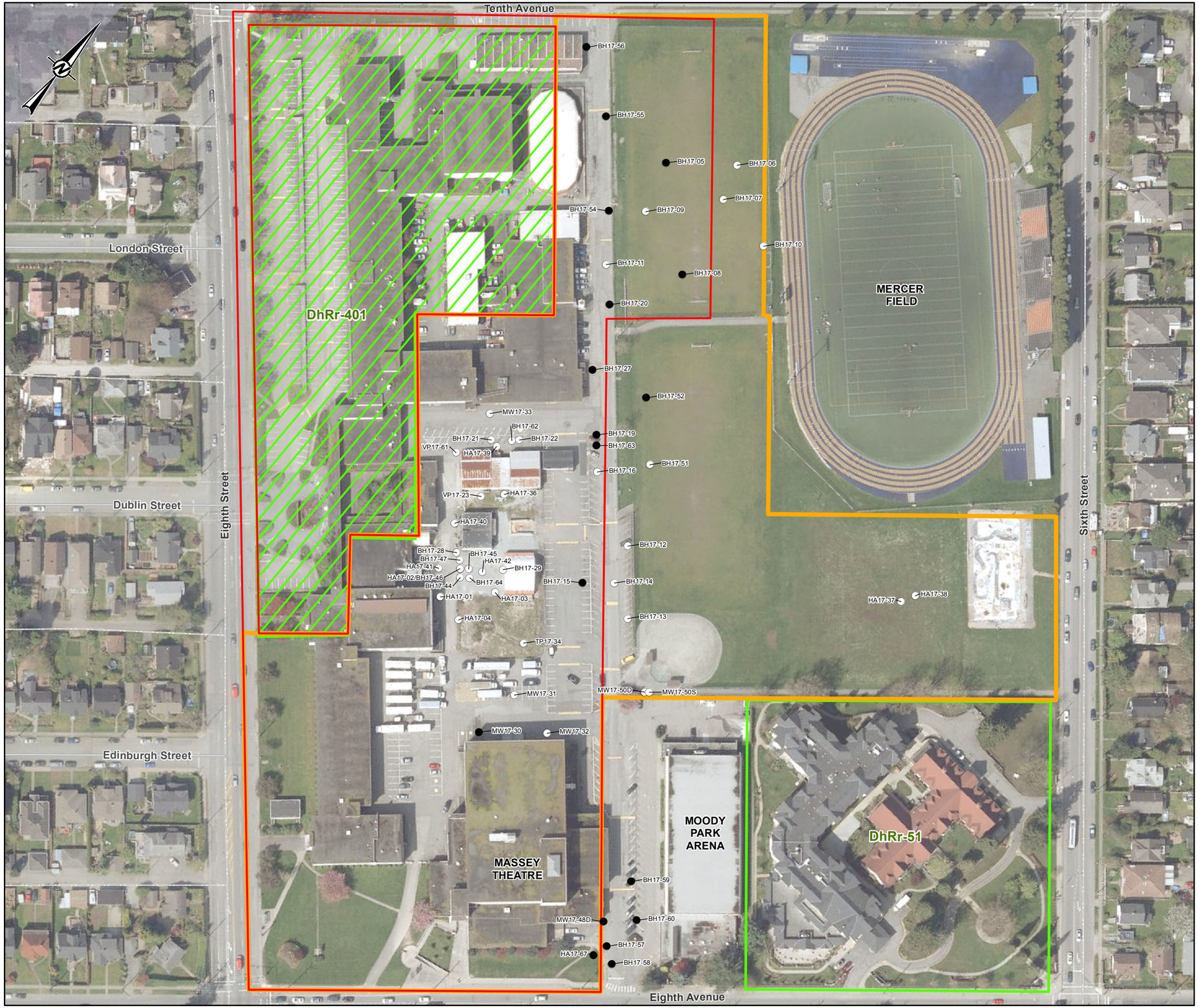

LEGEND

- MONITORED TEST, NEGATIVE RESULT
- MONITORED TEST, POSITIVE FOR HISTORICAL ARTIFACTS
- DESIGNATED CEMETERY (CIFSA)
- BUILT HISTORIC PLACE
- PROJECT AREA
- ARCHAEOLOGICAL SITE (DhRr-233)

BASE DATA

- LOCAL ROAD
- LOCAL STREET

0 40 80

1:1600 METRES

REFERENCES

1. ARCHAEOLOGICAL SITE DHRR-233 AND HISTORIC PLACES OBTAINED FROM B.C. MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS (2016/09/16).
2. PARCEL AND ROAD DATA CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE – BRITISH COLUMBIA.
3. IMAGERY COPYRIGHT © ESRI AND ITS LICENSORS. SOURCE: SURREY AERIALS. USED UNDER LICENSE, ALL RIGHTS RESERVED. IMAGERY DATE: 20130115.

DATUM: NAD83 COORDINATE SYSTEM: UTM ZONE 10

CLIENT
SCHOOL DISTRICT NO. 40 (NEW WESTMINSTER)

PROJECT
HERITAGE INVESTIGATIONS FOR THE NEW WESTMINSTER SECONDARY SCHOOL REPLACEMENT PROJECT
NEW WESTMINSTER, B.C.
(HCA PERMIT 2016-0377)

TITLE
ARCHAEOLOGICAL MONITORING OF GEO-ENVIRONMENTAL TESTS CONDUCTED 21 MARCH TO 23 AUGUST, 2017

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-17
DESIGNED	MY
PREPARED	MH
REVIEWED	CDM
APPROVED	ARM

PROJECT NO.	PHASE	REV.	FIGURE
0714120151	16300/16304	0	1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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Photograph 1: Example of hand auger test (HA17-41) in progress, looking south.

Photograph 2: Hand auger test (HA17-1), looking southwest.

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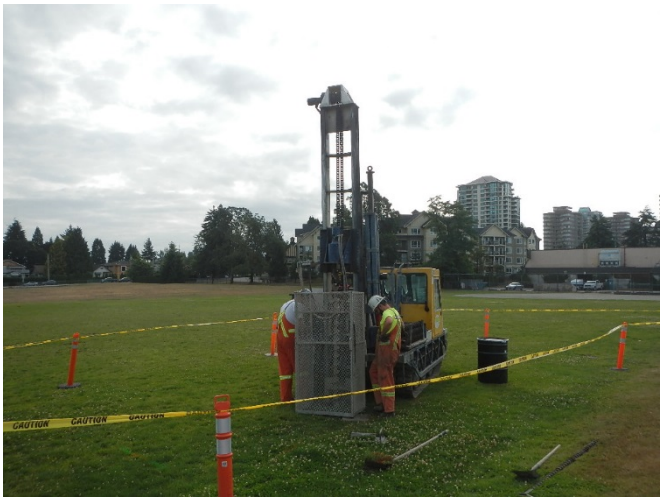
Photograph 3: General view of solid stem auger rig conducting borehole test (BH17-16). Looking northwest.

Photograph 4: Auger flight from BH17-16 (0 to 150 cm DBS), looking northwest.

Photograph 5: General view of sonic drill rig conducting borehole test (BH17-31). Looking south.

Photograph 6: Recovered samples from sonic drilling of BH17-30 (1.5 m to 3 m DBS on the left and 0.30 to 1.5 m DBS).



Photograph 7: General view of solid stem auger rig conducting borehole test (BH17-51). Looking east.

Photograph 8: Auger flight from BH17- 58 (0 to 150 cm DBS), looking northwest.

Photograph 9: Recovered samples from sonic drilling of BH17-63 (0 m to 1.5 m DBS).

Photograph 10: View of imported fill within geo-environmental test pit (TP17-34), looking southeast.

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