PATERSON GROUP

Geotechnical Investigation

Proposed Commercial Development

801 Eagleson Road
Ottawa, Ontario

Prepared for Urbandale Corporation

Report PG2574-1 Revision 1 dated June 25, 2025

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Appendices

1.0 Introduction

Paterson Group (Paterson) was commissioned by Urbandale Corporation to conduct a geotechnical investigation for the proposed commercial development to be located at 801 Eagleson Road in the City of Ottawa (reference should be made to Figure 1 - Key Plan in Appendix 2 of this report for the general site location).

The objectives of the geotechnical investigation were to:

- Determine the subsoil and groundwater conditions at this site by means of boreholes.
- Provide geotechnical recommendations pertaining to design of the proposed development including construction considerations which may affect the design.

This report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes geotechnical recommendations pertaining to the design and construction of the subject development as they are understood at the time of writing this report.

Investigating for the presence or potential presence of contamination on the subject property was not part of the scope of work of the present investigation. Therefore, the present report does not address environmental issues.

2.0 Proposed Development

Based on the available conceptual plan, it is understood that the proposed development will consist of six slab-on-grade commercial buildings (Buildings A1 to A3, C, D, and E) within the subject site.

Further, it is understood that the remainder of the site will generally be occupied by parking areas, access roads, loading zones, and landscaped areas. It is also expected that the subject site will be municipally serviced.

Furthermore, the fill material under the footprint of the proposed buildings was excavated and replaced with engineered fill between November 2021 and January 2022. During this time, Paterson carried out multiple site visits and inspections to assess and evaluate the placement of the engineered fill beneath the building footprint. Reference should be made to materials and testing inspection memorandums completed by Paterson attached to the current report in Appendix 3.

3.0 Method of Investigation

3.1 Field Investigation

Field Program

The field program for the geotechnical investigation was carried out on December 14 and 15, 2011, and consisted of advancing a total of 3 boreholes to a maximum depth of 13.3 m below the existing ground surface. In addition, previous geotechnical investigations were completed by others between 1992 and 2006 for the subject site.

The borehole locations were distributed in a manner to provide general coverage of the subject site, taking into consideration underground utilities and site features. The test hole locations are presented on Drawing PG2574-1 – Test Hole Location Plan included in Appendix 2.

The boreholes were advanced using a track-mounted auger drill rig operated by a two-person crew. The test hole procedure consisted of augering to the required depths at the selected locations, and sampling and testing the overburden soils. All fieldwork was conducted under the full-time supervision of our personnel under the direction of a senior engineer from our geotechnical department.

Sampling and In Situ Testing

Soil samples were either recovered directly from the auger flights (AU), collected using a 50 mm diameter split-spoon (SS) sampler, or 73 mm diameter thin-walled (TW) Shelby tubes in conjunction with a piston sampler. All samples were visually inspected and initially classified on site. The auger and split-spoon samples were placed in sealed plastic bags and the Shelby tubes were sealed at both ends on site and protected from disturbances over the entire process.

All samples were transported to our laboratory for further examination and classification. The depths at which the auger, split spoon, and Shelby tube samples were recovered from the boreholes are shown as AU, SS, and TW, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.

The Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split-spoon samples. The SPT results are recorded as “N” values on the Soil Profile and Test Data sheets. The “N” value is the number of blows required to drive the split-spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

Undrained shear strength testing was carried out in cohesive soils using a field vane apparatus.

The subsurface conditions observed in the boreholes were recorded in detail in the field. The soil profiles are logged on the Soil Profile and Test Data Sheets in Appendix 1 of this report.

Groundwater

All boreholes were fitted with a flexible polyethylene standpipe to allow groundwater level monitoring. The groundwater level readings were obtained after a suitable stabilization period subsequent to the completion of the field investigation.

The groundwater observations are discussed in Subsection 4.3 and presented in the Soil Profile and Test Data sheets in Appendix 1 of this report.

3.2 Field Survey

The location and ground surface elevation at the borehole locations were surveyed by Paterson field personnel. Ground surface elevations at the borehole locations were referenced to a temporary benchmark (TBM), consisting of the top spindle of the fire hydrant located along the south side of Bridgestone Drive adjacent to the subject site. A geodetic elevation of 97.75 m was provided for the TBM. The locations and ground surface elevations of the boreholes and the TBM are shown on Drawing PG2574-1 – Test Hole Location Plan attached to the present letter.

3.3 Laboratory Testing

Soil samples were recovered from the subject site and visually examined in our laboratory to review the results of the field logging. Consolidation testing was completed on select samples obtained from the geotechnical investigation.

3.4 Analytical Testing

One (1) soil sample was submitted for analytical testing to assess the corrosion potential for exposed ferrous metals and the potential of sulphate attacks against subsurface concrete structures. The samples were submitted to determine the concentration of sulphate and chloride, the resistivity, and the pH of the samples. The results are presented in Appendix 1 and are discussed further in Section 6.7.

4.0 Observations

4.1 Surface Conditions

At the time of the geotechnical investigation in 2011, the subject site was relatively flat and at grade with nearby roadways. Fill was noted at the ground surface across the majority of the subject site, with the exception of a drainage ditch running in an east-west direction, which was located within the southeast portion of the subject site. At that time, it was understood that the fill material had been present at the subject site for approximately 20 years.

It should be noted that the fill material below the footprint of the proposed buildings was excavated and replaced with engineered fill between November 2021 and January 2022. At that time, Paterson conducted multiple site visits and inspections to assess and evaluate the placement of the engineered fill below the footprint of the proposed buildings. Further, it should be noted that the previously existing drainage ditch within the footprint of Building A3 has been infilled with engineered fill to the underside of the footing elevation. Reference should be made to materials and testing inspection memorandums completed by Paterson attached to the current report in Appendix 3.

Currently, the subject site is vacant, and the majority of the site is covered by building pads placed during the previous construction activities. Historical aerial photographs of the subject site and its surroundings are provided in Figures 2, and 3 - Aerial Photographs, in Appendix 2.

The site is bordered by residential properties to the north, an elementary school to the east, Bridgestone Drive to the south, and Eagleson Road to the west. The ground surface across the subject site is relatively flat and approximately at grade with surrounding roadways and developments.

4.2 Subsurface Profile

At the time of our investigation in 2011, the subsoil profile encountered at the borehole locations generally consisted of a fill layer. The fill layer was generally observed to consist of silty clay and/or silty sand with gravel, and cobbles. The fill layer was observed to extend to maximum depths of 2.0 to 2.1 m below the existing ground surface.

A deposit of stiff to firm, brown to grey silty clay was observed underlying the fill layer at all boreholes and extended to a maximum depth of 13.3 m below the existing ground surface. Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole location.

It should be noted that the fill material beneath the footprint of the proposed buildings was excavated and replaced with engineered fill between November 2021 and January 2022. During that period, Paterson conducted several site visits and inspections to assess and evaluate the placement of the engineered fill below the footprint of the proposed buildings.

Bedrock

Based on available geological mapping, the bedrock across the subject site consists of interbedded limestone and dolomite of the Gull River formation. The overburden thickness across the subject site ranges from 15 to 50 m.

Consolidation Testing

Generally, the potential long-term settlement of a clay deposit may be evaluated based on its compressibility characteristics. A method to evaluate these characteristics is by completing unidimensional consolidation tests on undisturbed soil samples collected from Shelby tube samples.

A total of 3 unidimensional consolidation tests were completed on selected undisturbed silty clay samples from Shelby tubes collected during our field program. The results are presented in Table 1 and the Consolidation Testing Results sheet in Appendix 1.

The value for p'_c is the pre-consolidation pressure and p'_o is the effective overburden pressure of the test sample. The difference between the values is the available pre-consolidation. The values for C_{cr} and C_c are the recompression and compression indices, respectively. These soil parameters are a measure of the compressibility due to stress increases below and above the pre-consolidation pressures.

Table 1 – Summary of Consolidation Test Results

Borehole No.	Sample	Sample Elevation (m)	p'_c (kPa)	p'_o (kPa)	C_{cr}	C_c
BH 1	TW 7	88.52	104	68	0.019	0.712
BH 2	TW 7	85.60	117	86	0.010	0.693
BH 3	TW 6	90.27	98	58	0.019	0.874

Notes: p'_c: Pre-consolidation pressure; p'_o: Effective overburden pressure; C_{cr}: Recompression indice;
C_c: Compression indice.
Overburden pressure (p'_o) was calculated from the original ground surface.

4.3 Groundwater

Groundwater levels were measured within the installed piezometers on January 3, 2012. The measured groundwater levels noted at that time are presented in Table 2 below.

Table 2 – Summary of Groundwater Levels

Borehole Number	Ground Surface Elevation (m)	Measured Groundwater Level		Dated Recorded
		Depth (m)	Elevation (m)	
BH 1	96.56	4.46	92.10	January 3, 2012
BH 2	96.79	5.12	91.67	
BH 3	96.90	5.85	91.05	

Note: The ground surface elevations at the borehole locations were referenced to a TBM, consisting of the top spindle of the fire hydrant located along the south side of Bridgestone Drive, adjacent to the subject site. A geodetic elevation of 97.75 m was provided for the TBM.

It should be noted that surface water can become trapped within a backfilled borehole that can lead to higher than typical groundwater level observations. It should be noted that groundwater levels are subject to seasonal fluctuations, therefore the groundwater levels could vary at the time of construction.

Long-term groundwater levels can also be estimated based on the observed colour and consistency of the recovered soil samples. Based on these observations, the long-term groundwater table can be expected at an approximate elevation ranging from **91.00 to 92.00 m** across the subject site. The recorded groundwater levels are also provided on the applicable Soil Profile and Test Data sheet presented in Appendix 1.

5.0 Discussion

5.1 Geotechnical Assessment

From a geotechnical perspective, the subject site is suitable for the proposed development. It is recommended that the proposed commercial buildings be founded on conventional spread footings bearing on an undisturbed, very stiff to stiff silty clay layer and/or the existing engineered fill layer approved by Paterson Personnel at the time of construction.

Due to the presence of the sensitive silty clay deposit, the proposed development will be subjected to permissible grade raise restrictions. Permissible grade raise recommendations have been provided for the subject site. If higher than permissible grade raises are required, preloading with or without a surcharge, lightweight fill, and/or other measures should be investigated to reduce the risks of unacceptable long-term post-construction total and differential settlements.

The above and other considerations are further discussed in the following sections.

5.2 Site Grading and Preparation

Stripping Depth

Topsoil and any fill containing significant amounts of deleterious or organic materials should be stripped from under any buildings and other settlement sensitive structures.

If encountered, existing foundation walls and other construction debris should be entirely removed from within the building perimeters. Under paved areas, existing construction remnants, such as foundation walls should be excavated to a minimum of 1 m below final grade.

The existing fill material, where free of significant amounts of organic material, should be proof rolled by a vibratory roller making several passes under dry and above-freezing conditions, and reviewed and approved by Paterson Group at the time of construction. Provided that minimal flexing is observed the fill layer can be left in place as subgrade for the basement slab and pavement structure and for use as a bearing medium for footings.

Care should be taken not to disturb adequate bearing soils below the founding level during site preparation activities. Any poor-performing layers observed during the proof rolling program should be removed and reinstated with an approved engineered fill.

Any soft areas should be removed and backfilled with OPSS Granular B Type II, with a maximum particle size of 50 mm and compacted to 98% of the material's SPMDD.

Fill Placement

Fill placed for grading throughout the building footprint should consist, unless otherwise specified, of clean imported granular fill, such as Ontario Provincial Standard Specifications (OPSS) Granular A or Granular B Type II. Imported fill material should be tested and approved prior to delivery to the site. The fill should be placed in a maximum 300 mm thick loose lifts and compacted by suitable compaction equipment. Fill placed beneath the building should be compacted to a minimum of 98% of the standard Proctor maximum dry density (SPMDD).

Non-specified existing fill along with site-excavated soil could be placed as general landscaping fill and beneath exterior parking areas where settlement of the ground surface is of minor concern. These materials should be spread in a maximum of 300 mm thick loose lifts and compacted by the tracks of the spreading equipment to minimize voids. If this material is to be used to build up the subgrade level for areas to be paved, it should be compacted in maximum 300 mm thick loose lifts to at least 98% of the material's SPMDD.

The placement of subgrade material should be reviewed at the time of placement by Paterson personnel. Non-specified existing fill and site-excavated soils are not suitable for placement as backfill against foundation walls, unless used in conjunction with a geocomposite drainage membrane, such as Miradrain G100N or Delta Terraxx.

Fill used for grading beneath the base and subbase layers of paved areas should consist, unless otherwise specified, of clean imported granular fill, such as OPSS Granular A, Granular B Type II or select subgrade material. This material should be tested and approved by Paterson prior to delivery to the site. The fill should be placed in lifts no greater than 300 mm thick and compacted using suitable compaction equipment for the lift thickness. Fill placed beneath the paved areas should be compacted to at least 100% of its SPMDD.

5.3 Foundation Design

Bearing Resistance Values

Footings placed on an undisturbed, very stiff to stiff silty clay layer can be designed using a bearing resistance value at serviceability limit states (SLS) of **100 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **200 kPa.**

Footings placed on an approved engineered fill layer (as per subsection 5.2) can be designed using a bearing resistance value at serviceability limit states (SLS) of **125 kPa** and a factored bearing resistance value at ultimate limit states (ULS) of **225 kPa.**

An undisturbed soil bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of the concrete for the footings. The bearing resistance value at SLS will be subjected to potential post-construction total and differential settlements of 25 and 20 mm, respectively.

Settlement

Footings bearing on an undisturbed soil or an approved engineered fill and designed for the bearing resistance values at SLS provided herein will be subjected to potential post- construction total and differential settlements of 25 and 20 mm, respectively.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels.

Adequate lateral support is provided to the in-situ bearing medium soils above the groundwater table when a plane extending down and out from the bottom edge of the footing at a minimum of 1.5H:1V passes only through in situ soil of the same or higher capacity as the bearing medium soil.

In addition, care should be taken during the placement of the footings adjacent to the existing trunk sewer within the subject site. The proposed footings should be founded outside of the lateral support zone of the existing trunk sewer bedding which a plane extending down and out from the bottom edge of the pipe bedding at a minimum of 1H:1V passes only through in situ soil of the same or higher capacity as the bearing medium soil within the subject site.

Permissible Grade Raise Restriction

Due to the use of engineered fill (i.e., crushed stone fill such as OPSS Granular B Type II) to reinstate the previously existing ditch below Building A3 and the placement of engineered fill beneath the footprint of the proposed buildings, the dead weight of the stone will exert pressure on the underlying clay deposit, which will resist this load and may impact the permissible grade raise restriction.

Considering the use of engineered fill beneath the buildings' footprint and based on our site inspections during the placement of the engineered fill, a permissible grade raise of **96.7 m** (geodetic elevation) is recommended for finished grading within 6 m of a building footprint. A permissible grade raise restriction of **97.7 m** (geodetic elevation) is recommended for car parking areas and access lanes (beyond the 6 m zone with the proposed building footprints).

5.4 Design for Earthquakes

The site class for seismic site response can be taken as **Class X_D** for foundations identified throughout the subject site. The soils underlying the subject site are not susceptible to liquefaction. Reference should be made to the latest revision of the Ontario Building Code (OBC) 2024 for a full discussion of the earthquake design requirements.

5.5 Slab on Grade Construction

With the removal of all topsoil and fill, containing significant amounts of deleterious or organic materials, the native soil and/or approved fill is considered to be an acceptable subgrade surface on which to commence backfilling for floor slab construction.

For structures with slab-on-grade construction, it is recommended that the upper 200 mm of sub-slab fill consist of OPSS Granular A crushed stone compacted to a minimum of 98% of the materials SPMDD.

All backfill material within the footprints of the proposed buildings should be placed in a maximum of 300 mm thick loose layers and compacted to a minimum of 98% of the material's SPMDD.

Any soft areas should be removed and backfilled with appropriate backfill material prior to placing any fill. OPSS Granular B Type II, with a maximum particle size of 50 mm, is recommended for backfilling below the floor slab.

5.6 Pavement Design

For design purposes, the pavement structures presented in the following tables are recommended for the design of car-only parking areas, access lanes, and heavy truck parking and loading areas.

Table 3 - Recommended Pavement Structure - Car Only Parking Areas

Thickness (mm)	Material Description
50	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
300	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill.	

Table 4 - Recommended Pavement Structure - Access Lanes and Heavy Truck Parking/Loading Areas

Thickness (mm)	Material Description
40	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
450	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type II material.

The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 99% of the material's SPMDD using suitable vibratory equipment.

Pavement Structure Over the Trunk Sewer

It is understood a cover thickness of 0.8 m will be placed over the trunk sewer within the subject site. A minimum 100 mm thick layer of SM Rigid Insulation or equivalent should be placed over the existing service pipes and extend at least 2.4 m horizontally beyond the outside face of the service pipe in both directions. The recommended flexible pavement structure over the trunk sewer is presented in Table 5.

Table 5 – Recommended Flexible Pavement Structure – Access Roadways and Truck Traffic Areas - Over the Trunk Sewer

Thickness (mm)	Material Description
40	**Wear Course** – HL-3 or Superpave 12.5 Asphaltic Concrete
50	**Binder Course** – HL-8 or Superpave 19.0 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
460	**SUBBASE** - OPSS Granular B Type II
100	**SM Rigid Insulation (or equivalent)**
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or fill.	

Minimum Performance Graded (PG) 58-34 asphalt cement should be used for this project. The pavement granular base and subbase should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's SPMDD using suitable compaction equipment. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be excavated and replaced with OPSS Granular B Type I or II material.

Pavement Structure Drainage (Clay Areas)

Satisfactory performance of the pavement structure is largely dependent on the contact zone between the subgrade material and the base stone in a dry condition. Failure to provide adequate drainage under conditions of heavy wheel loading can result in the fine subgrade soil being pumped into the voids in the stone subbase, thereby reducing load carrying capacity.

Due to the low permeability of the subgrade materials consideration should be given to installing subdrains during the pavement construction as per the City of Ottawa standards. The subdrain inverts should be approximately 300 mm below subgrade level. The subgrade surface should be crowned to promote water flow to the drainage lines.

6.0 Design and Construction Precautions

6.1 Foundation Drainage and Backfill

Foundation Drainage

It is recommended that a perimeter foundation drainage system be provided for the proposed structures. The systems should consist of a 100 mm to 150 mm diameter perforated and corrugated plastic pipe, surrounded on all sides by 150 mm of 19 mm clear crushed stone, which is placed at the footing level around the exterior perimeter of each structure. The pipes should have positive outlet, such as a gravity connection to the storm sewer.

Foundation Backfill

Backfill against the exterior sides of the foundation walls should consist of free-draining, non-frost susceptible granular materials. The greater part of the site excavated materials will be frost susceptible and, as such, are not recommended for re-use as backfill against the foundation walls.

6.2 Protection of Footings Against Frost Action

Perimeter footings of heated structures are recommended to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or an equivalent combination of soil cover and foundation insulation, should be provided in this regard.

Exterior unheated footings, such as isolated piers, are more prone to deleterious movement associated with frost action than the exterior walls of the structure, and require additional protection, such as soil cover of 2.1 m, or an equivalent combination of soil cover and foundation insulation.

6.3 Excavation Side Slopes

Temporary Side Slopes

The temporary excavation side slopes anticipated should either be excavated to acceptable slopes or retained by shoring systems from the beginning of the excavation until the structure is backfilled. For the proposed development, it is expected that sufficient room will be available for the greater part of the excavation to be undertake by open-cut methods (i.e. unsupported excavations).

The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back at 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsurface soil is considered to be mainly a Type 2 and 3 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should maintain safe working distance from the excavation sides.

Slopes in excess of 3 m in height should be periodically inspected by the geotechnical consultant in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in trenches with steep or vertical sides. It is expected that services will be installed by “cut and cover” methods and excavations will not be left open for extended periods of time.

6.4 Pipe Bedding and Backfill

Bedding and backfill materials should be in accordance with the most recent Material Specifications and Standard Detail Drawings from the Department of Public Works and Services, Infrastructure Services Branch of the City of Ottawa.

The pipe bedding for the sewer and water pipes should consist of a minimum of 150 mm of OPSS Granular A. The bedding layer thickness should be increased to a minimum of 300 mm where the subgrade will consist of brown to grey silty clay. The material should be placed in a maximum 225 mm thick loose lifts and compacted to a minimum of 98% of its SPMDD. The bedding material should extend at least to the spring line of the pipe.

The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 95% of its SPMDD.

It should generally be possible to re-use the moist (not wet) site-generated fill above the cover material if the excavation and filling operations are carried out in dry weather conditions. Wet site-generated fill, such as brown to grey silty clay, will be difficult to re-use, as the high-water contents make compacting impractical without an extensive drying period.

Where hard surface areas are considered above the trench backfill, the trench backfill material within the frost zone (about 1.8 m below finished grade) should match the soils exposed at the trench walls to minimize differential frost heaving. The trench backfill should be placed in maximum 300 mm thick loose lifts and compacted to a minimum of 95% of the material's SPMDD.

Clay Seals

To reduce long-term lowering of the groundwater level at this site, clay seals should be provided in the service trenches if the trenches extend into the silty clay deposits. The seals should be at least 1.5 m long and should extend from trench wall to trench wall. Generally, the seals should extend from the frost line and fully penetrate the bedding, subbedding and cover material.

The barriers should consist of relatively dry and compactable brown silty clay placed in maximum 225 mm thick loose layers and compacted to a minimum of 95% of the material's SPMDD. The clay seals should be placed at the site boundaries and at strategic locations at no more than 60 m intervals in the service trenches.

6.5 Groundwater Control

It is anticipated that groundwater infiltration into the excavations should be low to moderate and controllable using open sumps. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

Groundwater Control for Building Construction

A temporary Ministry of the Environment, Conservation and Parks (MECP) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MECP.

For typical ground or surface water volumes being pumped during the construction phase, typically between 50,000 to 400,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16.

6.6 Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur.

In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures by the use of straw, propane heaters and tarpaulins or other suitable means. In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost in the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Additional information could be provided, if required.

6.7 Corrosion Potential and Sulphate

The results of analytical testing show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (GU – General Use cement) would be appropriate for this site. The chloride content and pH of the sample indicate that they are not a significant factor in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a high to very aggressive corrosive environment.

6.8 Existing Building Pads Conditions

Due to the placement of the pad and engineered fill below the underside of footing (USF) elevation of the proposed buildings between November 2021 and January 2022, and since the pads and engineered fill have remained in place since then, the bearing medium for the proposed footings should be reviewed and approved by Paterson during the construction phase.

It should be noted that Paterson should be notified to review and assess the condition of the previously placed pad and engineered fill materials before the placement of the proposed footing at the subject site.

6.9 Landscaping Considerations

Tree Planting Considerations

Tree planting shall follow the City of Ottawa's "Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines". As Atterberg limits testing was not completed as part of the geotechnical investigation program, it is recommended that tree planting setbacks from foundations be a minimum of 7.5 m for trees with a mature height smaller than or equal to 7.5 m, and for trees with a mature height greater than 7.5 m, the tree planting setback should be equal to the mature height of tree. It should be noted that shrubs are permitted to be planted within the tree planting setbacks. The 7.5 m tree planting setbacks would be applicable provided the conditions noted below are also met:

- The underside of footing (USF) is 2.1 m or greater below the lowest finished grade, as measured from the centre of the tree trunk.
- A small tree must be provided with a minimum 25 m^3 of available soil volume while a medium tree must be provided with a minimum of 30 m^3 of available soil volume, as determined by the Landscape Architect. The developer is to ensure that the soil is generally un-compacted when backfilling in street tree planting locations.
- The tree species must be small (mature tree height up to 7.5 m) to medium size (mature tree height 7.5 m to 14 m) as confirmed by the Landscape Architect.
- The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall).
- Grading surrounding the tree must promote drainage to the tree root zone (in such a manner as not to be detrimental to the tree).

A tree planting study, which would include Atterberg limits testing of silty clay samples from the site, would be required to determine if reduced tree planting setbacks of 4.5 m could be considered.

It is well documented in the literature, and is our experience, that fast-growing trees located near buildings founded on cohesive soils that shrink on drying can result in long-term differential settlements of the structures. Tree varieties that have the most pronounced effect on foundations are seen to consist of poplars, willows and some maples (i.e. Manitoba Maples), and, as such, they are not recommended to be considered in the landscaping design.

7.0 Recommendations

A materials testing and observation services program is a requirement for the provided foundation design data to be applicable. The following aspects of the program should be performed by the geotechnical consultant:

- ❑ Review of the final Grading Plan and other design details, from a geotechnical perspective.
- ❑ Observation of all bearing surfaces prior to the placement of concrete.
- ❑ Sampling and testing of the concrete and fill materials used.
- ❑ Periodic observation of the condition of unsupported excavation side slopes in excess of 3 m in height, if applicable.
- ❑ Observation of all subgrades prior to backfilling.
- ❑ Field density tests to determine the level of compaction achieved.
- ❑ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming that these works have been conducted in general accordance with our recommendations could be issued upon the completion of a satisfactory inspection program by the geotechnical consultant.

All excess soil must be handled as per ***Ontario Regulation 406/19: On-Site and Excess Soil Management*.**

8.0 Statement of Limitations

The recommendations provided are in accordance with the present understanding of the project. Paterson requests permission to review the recommendations when the drawings and specifications are completed.

A soils investigation is a limited sampling of a site. Should any conditions at the site be encountered which differ from those at the test locations, Paterson requests immediate notification to permit reassessment of our recommendations.

The recommendations provided herein should only be used by the design professionals associated with this project. They are not intended for contractors bidding on or undertaking the work. The latter should evaluate the factual information provided in this report and determine the suitability and completeness for their intended construction schedule and methods. Additional testing may be required for their purposes.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Urbandale Corporation, or their agents, is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

Paterson Group Inc.

Nicole R. L. Patey, P.Eng.

Scott S. Dennis, P.Eng.

Report Distribution:

- ❑ Urbandale Corporation (Email Copy)
- ❑ Paterson Group (1 Copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

HISTORICAL SOIL PROFILE AND TEST DATA SHEETS BY OTHERS

CONSOLIDATION TESTING RESULTS

ANALYTICAL TESTING RESULTS

patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development-Eagleson Road
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant, across subject site, on Bridgestone Drive. Geodetic elevation = 97.75m.

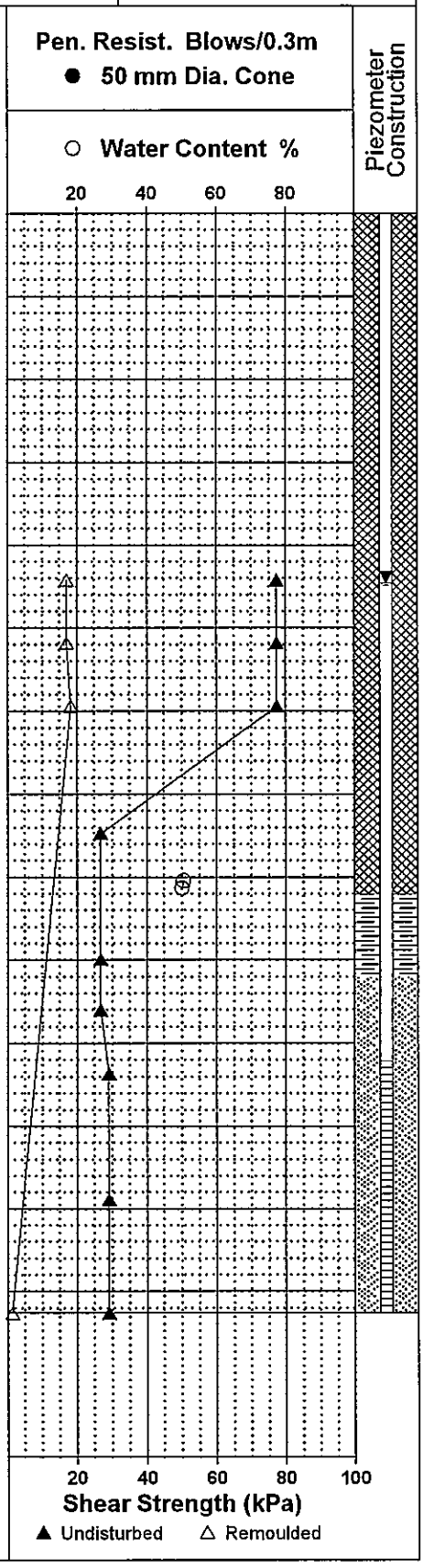
FILE NO. **PG2574**

REMARKS

HOLE NO. **BH 1**

BORINGS BY CME 55 Power Auger DATE 15 December 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.56
FILL: Brown silty clay, trace sand, gravel and cobbles		AU	1				
		SS	2	50	14	1	95.56
2.03		SS	3	58	5	2	94.56
TOPSOIL 2.13		SS	4	75	14	3	93.56
		SS	5	100	5	4	92.56
						5	91.56
		TW	6	100		6	90.56
Stiff to firm, grey **SILTY CLAY**						7	89.56
		TW	7	100		8	88.56
						9	87.56
						10	86.56
		TW	8	0		11	85.56
						12	84.56
		TW	9	100		13	83.56
13.26							
End of Borehole							
(GWL @ 4.46m-Jan. 3/12)							



patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development-Eagleson Road
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant, across subject site, on Bridgestone Drive. Geodetic elevation = 97.75m.

FILE NO. **PG2574**

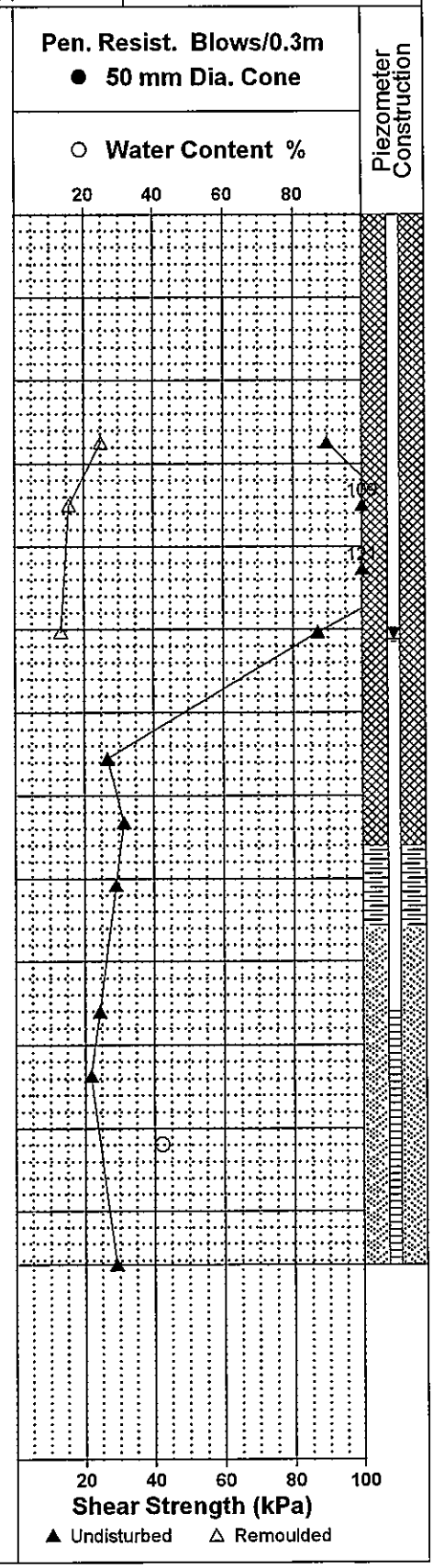
REMARKS

HOLE NO. **BH 2**

BORINGS BY CME 55 Power Auger

DATE 14 December 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.79
FILL: Brown silty clay with sand, gravel, cobbles, trace boulders (0.30)		AU	1				
		AU	2				
FILL: Brown silty sand with clay, gravel, cobbles, boulders (1.45)		SS	3	33	6	1	95.79
FILL: Brown silty clay with gravel and cobbles (2.21)		SS	4	75	4	2	94.79
						3	93.79
Very stiff to stiff, brown **SILTY CLAY**						4	92.79
		TW	5	100		5	91.79
- firm and grey by 6.0m depth						6	90.79
						7	89.79
						8	88.79
		TW	6	100		9	87.79
						10	86.79
		TW	7			11	85.79
						12	84.79
(12.65)							
End of Borehole							
(GWL @ 5.12m-Jan. 3/12)							



patersongroup

Consulting Engineers

28 Concourse Gate, Unit 1, Ottawa, ON K2E 7T7

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Prop. Commercial Development-Eagleson Road
Ottawa, Ontario

DATUM TBM - Top spindle of fire hydrant, across subject site, on Bridgestone Drive. Geodetic elevation = 97.75m.

FILE NO. **PG2574**

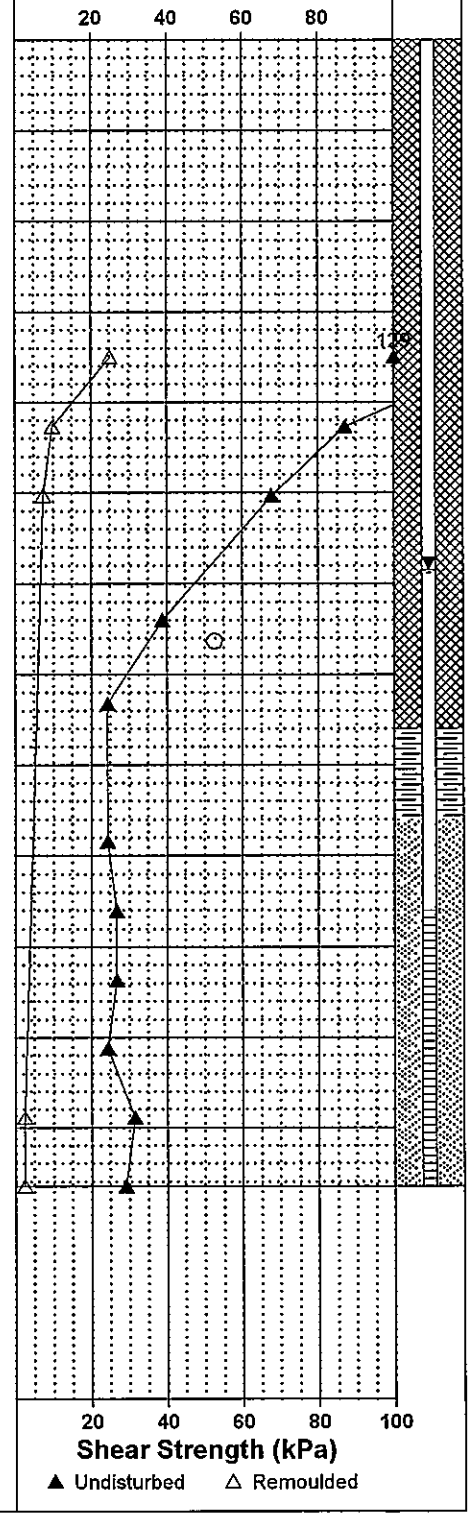
REMARKS

HOLE NO. **BH 3**

BORINGS BY CME 55 Power Auger DATE 15 December 2011

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.90
FILL: Brown silty clay with gravel, cobbles, trace boulders		AU	1				
		AU	2				
		SS	3			1	95.90
		SS	4		10	2	94.90
2.21		SS	5		7	3	93.90
Very stiff to stiff, brown **SILTY CLAY**						4	92.90
						5	91.90
- firm and grey by 5.2m depth						6	90.90
		TW	6	100		7	89.90
		TW	7	100		8	88.90
						9	87.90
						10	86.90
						11	85.90
12.65						12	84.90
End of Borehole							
(GWL @ 5.85m-Jan. 3/12)							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone
○ Water Content %



Piezometer Construction

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<2
Soft	12-25	2-4
Firm	25-50	4-8
Stiff	50-100	8-15
Very Stiff	100-200	15-30
Hard	>200	>30

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

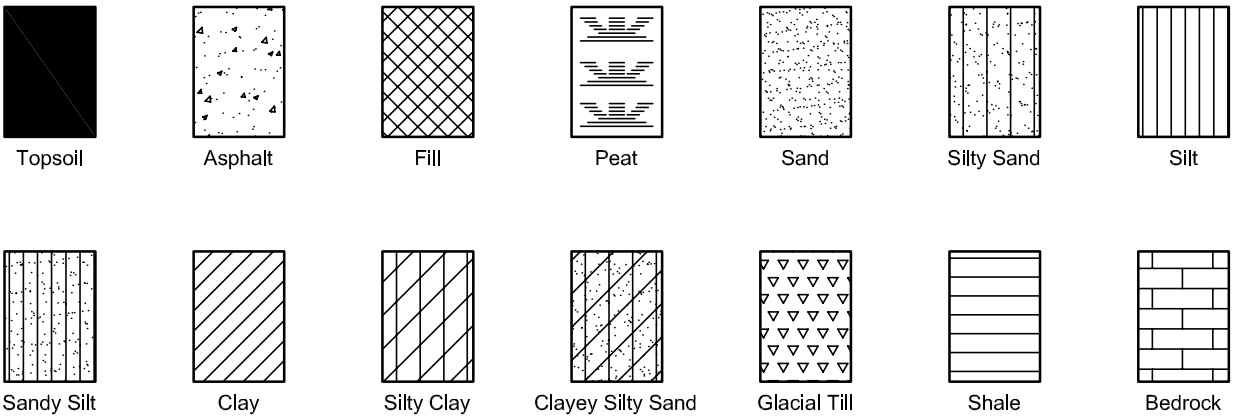
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

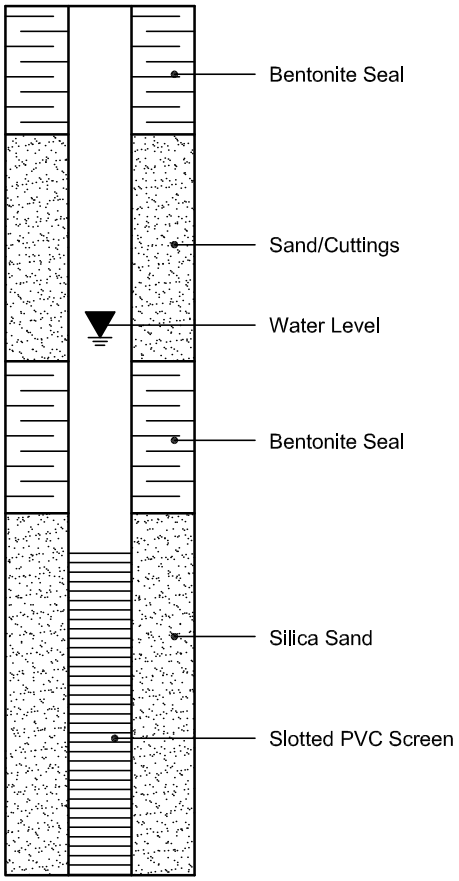
SYMBOLS AND TERMS (continued)

STRATA PLOT

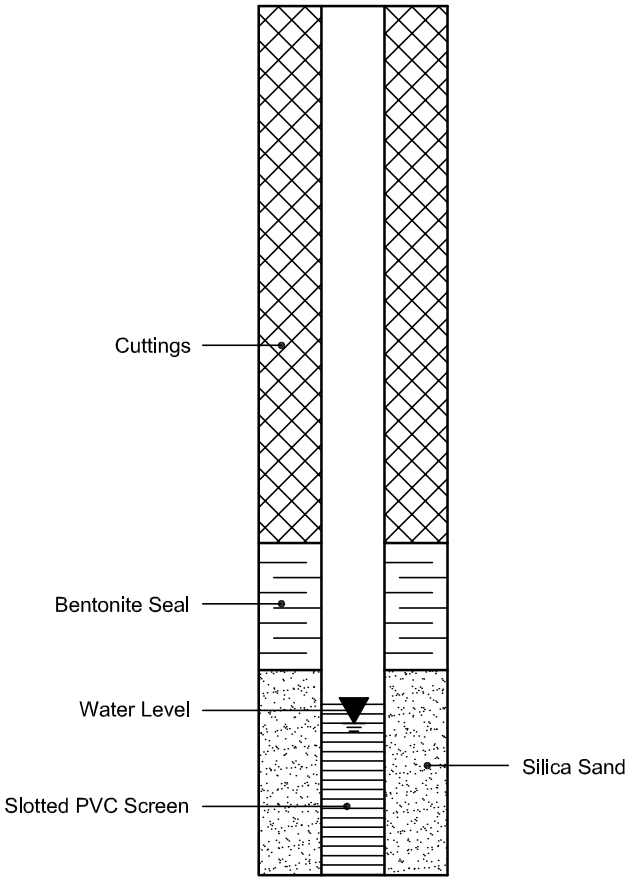


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



PROJECT: 06-1120-227

RECORD OF BOREHOLE: BH 06-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 18, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.61							
0	Power Auger 200mm Diam. (Hollow Stem)	Compact to very dense brown sandy silt, some gravel, infilling of sandstone rockfill (FILL)		0.00							
1					1	50 DO					
					2	50 DO					
2				94.63							
		Very stiff grey brown silty clay, trace sand, organic matter (POSSIBLY FILL)		1.98							
					3	50 DO	11				
3				93.68							▽
		Very stiff to stiff grey brown SILTY CLAY, occasional sand seams (Weathered Crust)		2.93							
					4	50 DO	4				
4				92.19							
		Stiff grey SILTY CLAY		4.42							
					5	50 DO					
5											
6				90.67							
		Firm grey SILTY CLAY, trace black organic matter		5.94							
					6	50 DO	WH				
7											
		End of Borehole		88.99 7.62							Water level in open hole at elev. 93.71m upon completion of drilling August 18, 2006.
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-BOREHOLES.GPJ GLDR_CAN.GDT 24/8/06 NBHS

PROJECT: 06-1120-227

RECORD OF BOREHOLE: BH 06-2

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 18, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl; 20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.23							
0	Power Auger 200mm Diam. (Hollow Stem)	Compact brown sandy silt, trace brick and silty clay, infill of rockfill (FILL)		0.00							Bentonite Seal
1					1	50 DO	21				
				94.86							Native Backfill
		Dark brown silty TOPSOIL		1.37							
				94.55							
		Very stiff grey brown SILTY CLAY, occasional sand seam (Weathered Crust)		1.68	2	50 DO	11				
2					3	50 DO	6				Bentonite Seal
				93.27							
3		Very stiff to stiff grey SILTY CLAY with fine sand seams		2.96	4	50 DO	2				
4								⊕ +			Native Backfill
				91.81				⊕ +			
		Soft to firm grey SILTY CLAY, trace black organic matter		4.42	5	50 DO	WH				
5								⊕ +			
6								⊕ +			32mm Diam. PVC #10 Slot Screen
								⊕ +			Native Cave
				89.22				⊕ +			
7		End of Borehole		7.01							Water level in screen at elev. 93.83m on August 23, 2006.
8											
9											
10											

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-BOREHOLES.GPJ GLDR_CAN.GDT 24/8/06 NBHS

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.31							
0	Excavator	Brown sand and broken rock (FILL)		0.00							
				95.41							
1		Compact grey clay, some light brown sand and black topsoil (FILL)		0.90							
				94.31							
2		Black TOPSOIL		2.00							
				94.01							
		Stiff grey SILTY CLAY		2.30							
				93.71							
		End of Test Pit		2.60							
3											Test Pit dry upon completion of digging August 17, 2006.
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-2

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ●, rem V. ⊕ U - O) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.78							
0	Excavator	Compact light and dark brown sand, some grey clay and gravel (FILL)		0.00							
		Dark brown TOPSOIL		95.08 1.70							
1		Stiff grey SILTY CLAY		94.88 1.90							
2		End of Test Pit		94.58 2.20							Test Pit dry upon completion of digging August 17, 2006.
3											
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-3

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. +, Q - ●; rem V. ⊕, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.23									
0	Excavator	Compact light and dark brown sand, some grey silty clay, pieces of broken rock (sandstone) (FILL)		0.00									
				94.33									
1		Stiff grey SILTY CLAY		1.90									
				94.03									
2		End of Test Pit		2.20									Test Pit dry upon completion of digging August 17, 2006.
3													
4													
5													

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-4

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-4} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp, W, Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.66							
0	Excavator	Compact broken rock, some light and dark brown sand (FILL)		0.00							
				94.76							
2		Stiff grey SILTY CLAY		1.90							
				94.26							
		End of Test Pit		2.40							Test Pit dry upon completion of digging August 17, 2006.
3											
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-5

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.28							
0	Excavator	Compact light and dark brown sand, some topsoil (black and grey clay) (FILL)		0.00							
1											
2		Black TOPSOIL		94.28 2.00							
		Stiff grey SILTY CLAY		93.98 2.30							
3		End of Test Pit		93.58 2.70							Test Pit dry upon completion of digging August 17, 2006.
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/6/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-6

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		95.70							
0	Excavator	Compact broken rock (sandstone), light and dark brown sand mixed with grey clay (FILL)		0.00							
		Black TOPSOIL		92.75 2.95							
		Stiff grey SILTY CLAY		92.50 3.20							
		End of Test Pit		92.20 3.50							Test Pit dry upon completion of digging August 17, 2006.
1											
2											
3											
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-7

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.35							
0	Excavator	Compact broken rock and sand, some black topsoil and grey clay (FILL)		0.00							
1											
2		Black TOPSOIL		94.35 2.00							
		Stiff Grey SILTY CLAY		93.85 2.50							
3		End of Test Pit		93.55 2.80							Test Pit dry upon completion of digging August 17, 2006.
4											
5											

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

PROJECT: 06-1120-227

RECORD OF TEST PIT: TP 06-8

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 17, 2006

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		96.51							
0	Excavator	Broken rock (sandstone), light and dark brown sand, some grey clay (FILL)		0.00							
				94.21							
		Black TOPSOIL		2.30							
				93.91							
3		Stiff grey SILTY CLAY		2.60							
				93.31							
		End of Test Pit		3.20							

Water seepage in open Test Pit at elev. 93.31m upon completion of digging August 17, 2006.

DEPTH SCALE

1 : 25

Golder Associates

LOGGED: D.J.S.

CHECKED: M.S.L.

MIS-BHS 001 06-1120-227-TEST PITS.GPJ GLDR_CAN.GDT 21/8/06

KANATA BRIDLEWOOD PHASE 5	GROUND SURFACE ELEVATION SUPPLIED BY	BOREHOLE No. 92-1
J.L.RICHARDS AND ASSOCIATES	J.L. RICHARDS AND ASSOCIATES LTD.	Project No: E - 6788
START DATE: 22/05/92 -		ELEVATION 94.61 (m)

SAMPLE TYPE ■ DISTURBED ☒ SHELBY TUBE ☒ SPLIT SPOON ▤ PROBING ▯ NO RECOVERY ▮ CORE

DEPTH (m)	SMALL PEN. (kPa)	SPT (N)	SAMPLE TYPE	SAMPLE NO	USC	SOIL/ROCK DESCRIPTION	ELEVATION(m)
0.0						TOPSOIL	94.6
						94.31	
		2/45cm	☒	1		Water level MAY 26/92 ELEV 94.46m	
	155,165,165	4	☒	2		very stiff	
1.0		3/15cm				brownish gray CLAY	93.6
	145,145,125	1/15cm	☒	3			
		4					
2.0						92.66	92.6
3.0	85,85,85	1/45cm	☒	4		medium soft	91.6
						silty gray CLAY	
4.0							90.6
						90.11	
	40,40,30	1/45cm	☒	5			
5.0							89.6
6.0	20,20,20	1/45cm	☒	6		soft	88.6
						silty gray CLAY	
7.0							87.6
	50,50,50			7			
	65,60,60						
8.0	50,50,60					Borehole continued 86.61	86.6

■ VANE Cu (kPa) ■ 80 160 240 320

▲ VANE Cu REMOULDED (kPa) ▲ 80 160 240 320

PLASTIC M.C. LIQUID 20 40 60 80

McROSTIE GENEST ST-LOUIS Ottawa, Canada	COMPLETION DEPTH 30.0 m	COMPLETE 25/05/92
	LOGGED BY JML	DWG NO.
		Page 1 of 4

PLATE NO.5

KANATA BRIDLEWOOD PHASE 5	GROUND SURFACE ELEVATION SUPPLIED BY	BOREHOLE No. 92-1
J.L.RICHARDS AND ASSOCIATES	J.L. RICHARDS AND ASSOCIATES LTD.	Project No: E - 6788
START DATE: 22/05/92 -		ELEVATION 94.61 (m)

SAMPLE TYPE ■ DISTURBED ▨ SHELBY TUBE ⊠ SPLIT SPOON ▤ PROBING ▯ NO RECOVERY ▮ CORE

DEPTH (m)	SMALL PEN. (kPa)	SPT (N)	SAMPLE TYPE	SAMPLE NO	USC	SOIL/ROCK DESCRIPTION	ELEVATION(m)
8.0	50,50,65			7			86.6
	65,65,60						
	50,50,50			8			
	60,65,70						
9.0							85.6
10.0							84.6
11.0							83.6
12.0	20,20,20	wt of rods /45cm		9		soft silty gray CLAY	82.6
13.0							81.6
	20,20,10	wt of rods /45cm		10			
14.0							80.6
15.0	95,95,105						79.6
	60,65,65			11			
	65,75,65						
	65,75,80			12			
16.0						Borehole continued 78.61	78.6

■ VANE Cu (kPa) ■ 80 160 240 320

▲ VANE Cu REMOULDED (kPa) ▲ 80 160 240 320

PLASTIC M.C. LIQUID 20 40 60 80

McROSTIE GENEST ST-LOUIS Ottawa, Canada	COMPLETION DEPTH 30.0 m	COMPLETE 25/05/92
	LOGGED BY JML	DWG NO.
		Page 2 of 4

FIGURE 3

KANATA BRIDLEWOOD PHASE 5	GROUND SURFACE ELEVATION SUPPLIED BY	BOREHOLE No. 92-1
J.L.RICHARDS AND ASSOCIATES	J.L. RICHARDS AND ASSOCIATES LTD.	Project No: E - 6788
START DATE: 22/05/92 -		ELEVATION 94.61 (m)

SAMPLE TYPE ■ DISTURBED ⊘ SHELBY TUBE ⊠ SPLIT SPOON ▤ PROBING ▯ NO RECOVERY ▮ CORE

DEPTH (m)	SMALL PEN. (kPa)	SPT (N)	SAMPLE TYPE	SAMPLE NO	USC	SOIL/ROCK DESCRIPTION	VANE Cu (kPa) / VANE Cu REMOULDED (kPa) 80 160 240 320; PLASTIC M.C. LIQUID 20 40 60 80; PROBING (Blows/30cm) 20 40 60 80	ELEVATION(m)
16.0	65,65,65		⊠	12A				78.6
17.0						soft silty gray CLAY		77.6
						PROBING 76.81		
18.0								76.6
19.0								75.6
20.0								74.6
21.0						SOIL with low resistance to penetration		73.6
22.0								72.6
23.0								71.6
24.0						Borehole continued 70.61		70.6

McROSTIE GENEST ST-LOUIS
Ottawa, Canada

COMPLETION DEPTH 30.0 m	COMPLETE 25/05/92
LOGGED BY JML	DWG NO.

KANATA BRIDLEWOOD PHASE 5	GROUND SURFACE ELEVATION SUPPLIED BY	BOREHOLE No. 92-1
J.L.RICHARDS AND ASSOCIATES	J.L. RICHARDS AND ASSOCIATES LTD.	Project No: E - 6788
START DATE: 22/05/92 -		ELEVATION 94.61 (m)

SAMPLE TYPE ■ DISTURBED ▨ SHELBY TUBE ⊠ SPLIT SPOON ▤ PROBING ▯ NO RECOVERY ▮ CORE

DEPTH (m)	SMALL PEN. SPT (kPa) (N)	SAMPLE TYPE	SAMPLE NO	USC	SOIL/ROCK DESCRIPTION	◆PROBING (Blows/30cm)◆ 20 40 60 80 PLASTIC M.C. LIQUID 20 40 60 80	ELEVATION(m)
24.0							70.6
25.0					SOIL with low resistance to penetration		69.6
26.0							68.6
27.0					67.60		67.6
28.0					SOIL with medium resistance to penetration		66.6
29.0					65.11		65.6
30.0					SOIL with high resistance to penetration Bottom of hole Probing refusal 64.61		64.6
31.0							63.6
32.0							62.6

McROSTIE GENEST ST-LOUIS
Ottawa, Canada

COMPLETION DEPTH 30.0 m		COMPLETE 25/05/92
LOGGED BY JML	DWG NO.	Page 4 of 4

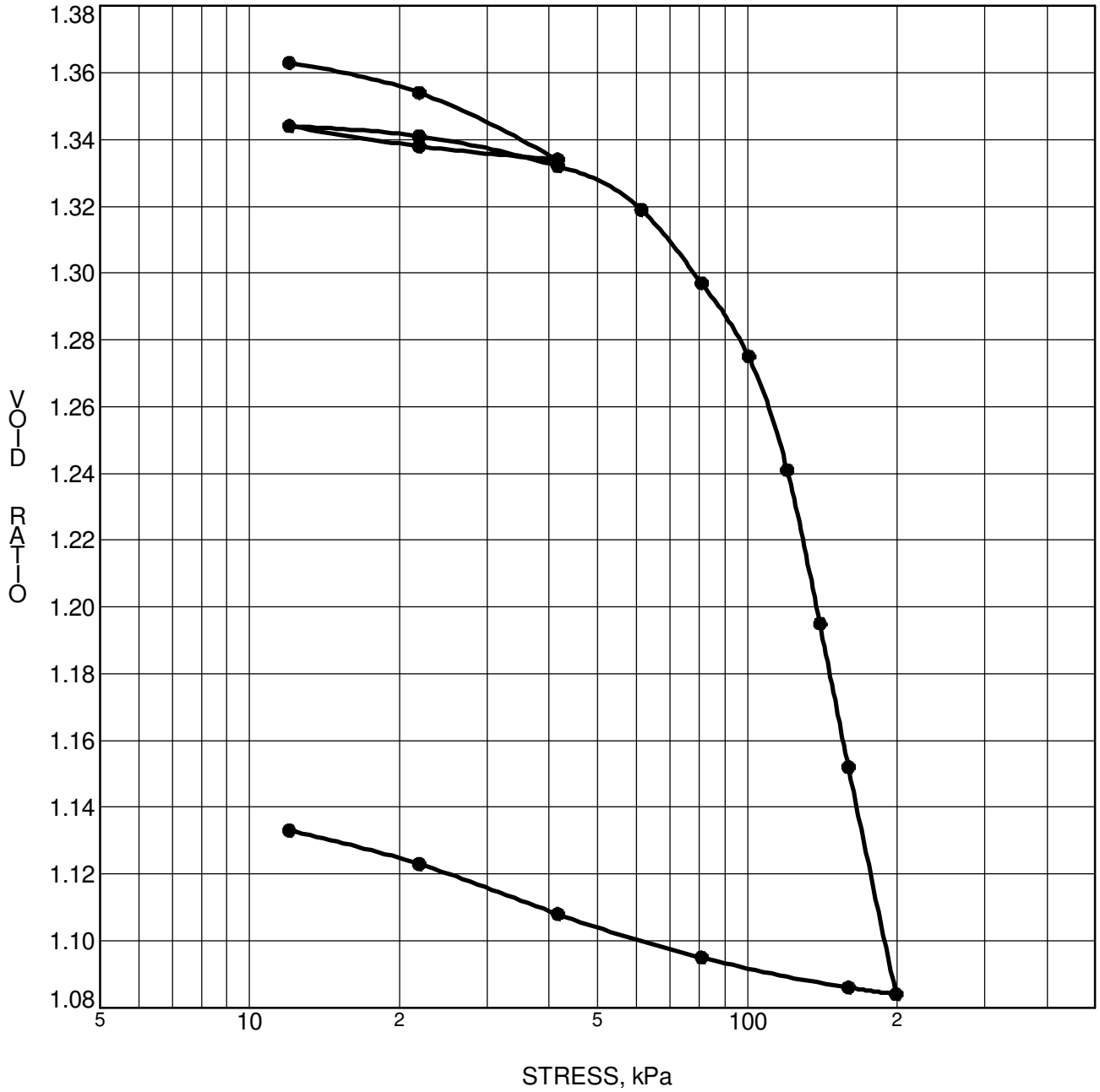
TABLE 1

RECORD OF TEST PITS – 801 Eagleson Road

Test Pit Number	Depth (metres)	Soil Description
T.P. 11-1 (Elev. 96.85 m)	0.00 to 1.60	FILL – compact dark and light brown sand with some grey silty clay and pieces of broken rock
	1.60 to 1.75	Dark brown TOPSOIL
	1.75 to 2.10	Grey brown SILTY CLAY
	2.10	End of test pit.
		Water seepage at 1.75 m
T.P. 11-2 (Elev. 96.37 m)	0.00 to 1.40	FILL – sand and gravel with some grey silty clay and pieces of broken rock
	1.40 to 1.70	Black TOPSOIL
	1.70 to 2.10	Grey brown SILTY CLAY
	2.10	End of test pit
		No water seepage
T.P. 11-3 (Elev. 96.65 m)	0.00 to 1.50	FILL – dark brown sand with some grey silty clay
	1.50 to 1.80	Black TOPSOIL, some roots
	1.80 to 2.10	Grey brown SILTY CLAY
	2.10	End of test pit
		No water seepage
T.P. 11-4 (Elev. 96.62 m)	0.00 to 1.90	FILL – dark brown sand with some silty clay and pieces of broken rock
	1.90 to 2.40	Black TOPSOIL
	2.40 to 2.40	Grey brown SILTY CLAY
	2.40	End of test pit
		Slight water seepage at 2.40 m
T.P. 11-5 (Elev. 96.70 m)	0.00 to 1.60	FILL – dark brown sand with some silty clay and pieces of broken rock
	1.60 to 1.90	Black TOPSOIL
	1.90 to 2.20	Grey brown SILTY CLAY
	2.20	End of test pit
		No water seepage
T.P. 11-6 (Elev. 96.52 m)	0.00 to 1.65	FILL – dark brown sand and gravel with some grey silty clay
	1.65 to 2.00	Grey brown SILTY CLAY
	2.00	End of test pit
		No water seepage

TABLE 1 – (Continued)

Test Pit Number	Depth (metres)	Description
T.P. 11-7 (Elev. 95.93 m)	0.00 to 1.10	FILL – broken rock (limestone) with some sand, gravel and clay
	1.10 to 1.40	Black TOPSOIL
	1.40 to 1.80	Grey brown SILTY CLAY
	1.80	End of test pit
		No water seepage
T.P. 11-8 (Elev. 96.53 m)	0.00 to 1.70	FILL – broken rock (limestone) with some sand, gravel and clay
	1.70 to 1.85	Black TOPSOIL
	1.85 to 2.20	Grey brown SILTY CLAY
	2.20	End of test pit
		Water seepage at 1.85 m



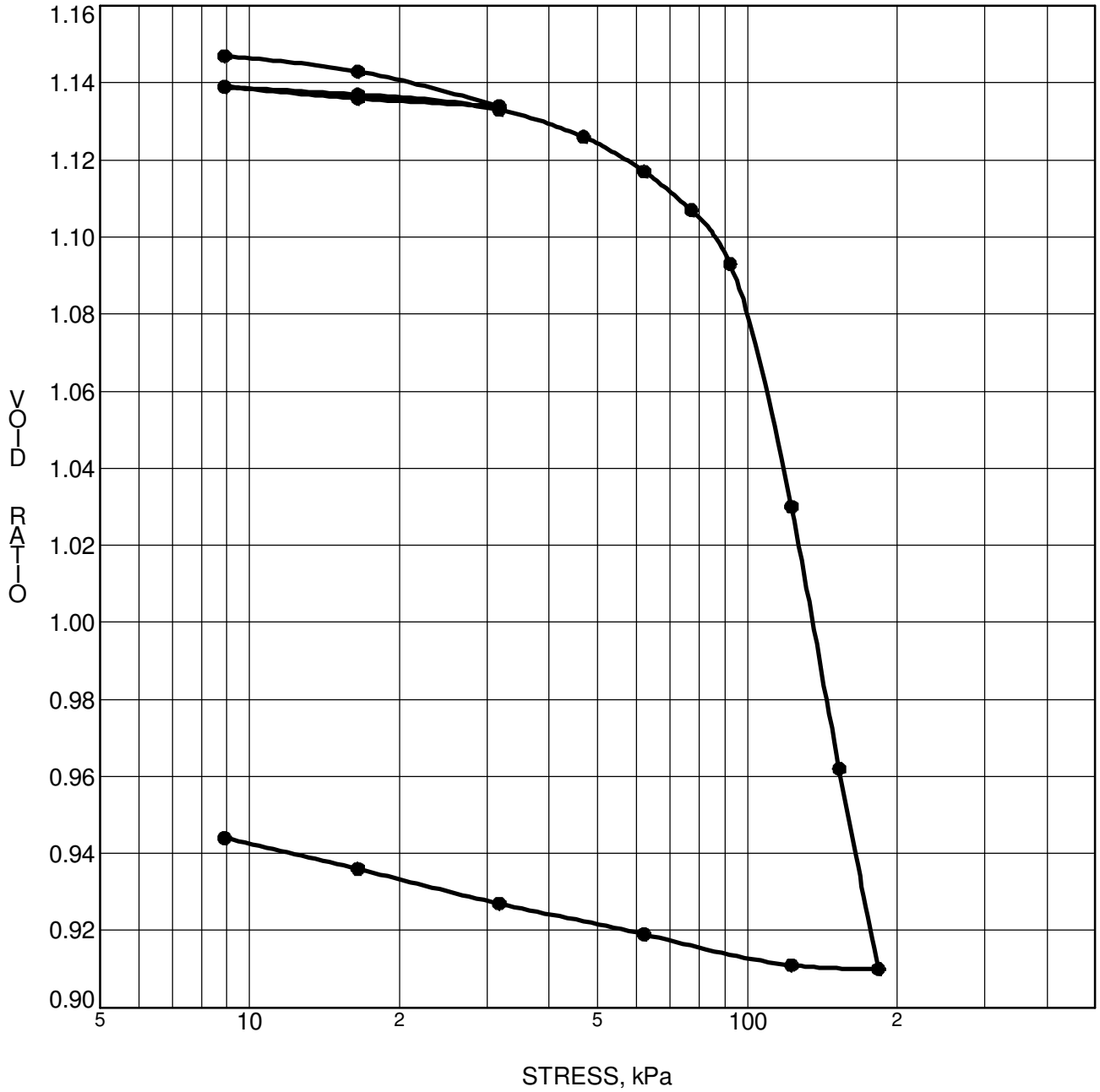
CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 1**	p'_o	**68** kPa	Ccr	**0.019**
Sample No.	**TW 7**	p'_c	**104** kPa	Cc	**0.712**
Sample Depth	**8.04** m	OC Ratio	**1.5**	Wo	**50.4** %
Sample Elev.	**88.52** m	Void Ratio	**1.387**	Unit Wt.	**17.3** kN/m ^{3}

Overburden pressure calculated based on original ground surface (elev. 94.4m)

CLIENT	**Urbandale Corporation**	FILE NO.	**PG2574**
PROJECT	**Geotechnical Investigation - Prop. Commercial Development-Eagleson Road**	DATE	**12/23/2011**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST



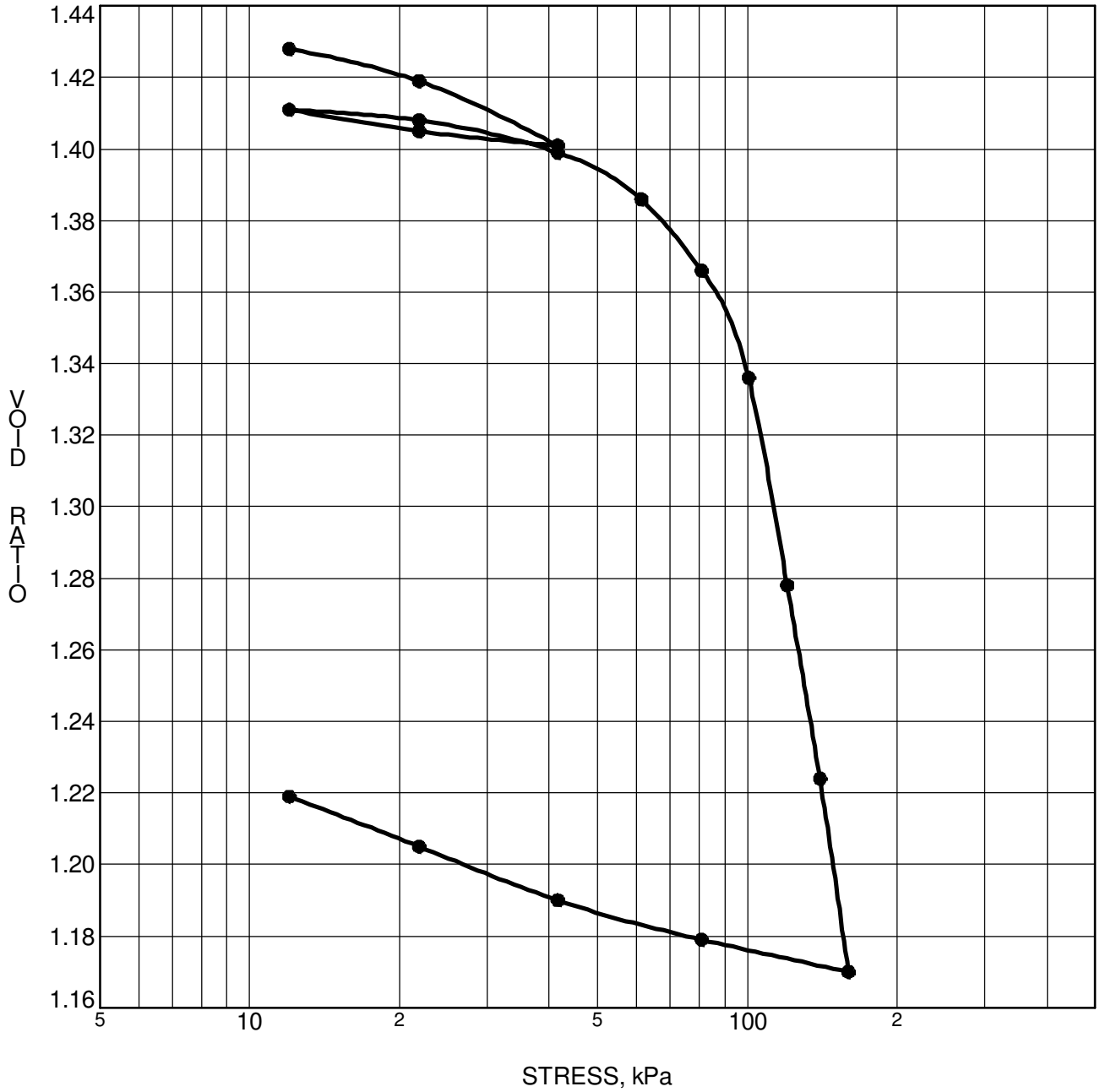
CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 2**	p'_o	**86** kPa	Ccr	**0.010**
Sample No.	**TW 7**	p'_c	**117** kPa	Cc	**0.693**
Sample Depth	**11.19** m	OC Ratio	**1.4**	Wo	**42.1** %
Sample Elev.	**85.60** m	Void Ratio	**1.158**	Unit Wt.	**17.3** kN/m ^{3}

Overburden pressure calculated based on original ground surface (elev. 94.6m)

CLIENT	**Urbandale Corporation**	FILE NO.	**PG2574**
PROJECT	**Geotechnical Investigation - Prop. Commercial Development-Eagleson Road**	DATE	**12/22/2011**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST



CONSOLIDATION TEST DATA SUMMARY					
Borehole No.	**BH 3**	p'_o	**58** kPa	Ccr	**0.019**
Sample No.	**TW 6**	p'_c	**98** kPa	Cc	**0.874**
Sample Depth	**6.63** m	OC Ratio	**1.7**	Wo	**52.6** %
Sample Elev.	**90.27** m	Void Ratio	**1.446**	Unit Wt.	**17.3** kN/m ^{3}

Overburden pressure calculated based on original ground surface (elev. 94.7m)

CLIENT	**Urbandale Corporation**	FILE NO.	**PG2574**
PROJECT	**Geotechnical Investigation - Prop. Commercial Development-Eagleson Road**	DATE	**12/22/2011**

patersongroup Consulting Engineers
28 Concouse Gate, Unit 1, Ottawa, Ontario K2E 7T7

CONSOLIDATION TEST

Certificate of Analysis

Report Date: 21-Dec-2011

Client: **Paterson Group Consulting Engineers**

Order Date:16-Dec-2011

Client PO: 11102

Project Description: PG2574

	Client ID:	BH2 SS4	-	-	-
	Sample Date:	14-Dec-11	-	-	-
	Sample ID:	1151255-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	79.4	-	-	-
General Inorganics					
pH	0.1 pH Units	7.3	-	-	-
Resistivity	0.10 Ohm.m	10.1	-	-	-
Anions					
Chloride	5 ug/g dry	556	-	-	-
Sulphate	5 ug/g dry	175	-	-	-

APPENDIX 2

MATERIAL INSPECTIONS AND TESTING MEMORANDUMS

patersongroup **memorandum**

solution oriented engineering

re: **Geotechnical Review – Site Observations and Recommendations**
801 Eagleson Road, Ottawa, Ontario

to: Urbandale Corperation – Roger Tuttle – rtuttle@urbandale.com
date: November 24, 2021
file: PM13772-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) was on site to meet with the project team and review site conditions, notably the fill that was placed on the east half of buildings A2 and A3.

Site Observations

Please refer to attached site sketch which should be read in conjunction with this report.

The area in blue consisted of a mixed silty clay with gravel and boulder fill. Some large boulders up to 1.0 m diameter were observed. Based on previous review at the site, the clay subgrade below the fill is in good condition. The mixed fill was placed on the subexcavated subgrade as underside of footing (USF) buildup. When this material was placed on the subgrade, significant water was present on the subgrade. The blue area was proof rolled on site and major flexing was observed, with conditions being especially poor at building A3.

Based on the test pits excavated within this fill material yesterday, it was revealed that the fill had a considerably high moisture content and therefore not suitable for compaction. During summer, it may be possible to dry out the fill, however this is not possible during winter construction.

The green area consisted of blast rock fill placed on the native silty clay subgrade. This area was also proof rolled with a large steel drum roller and was in good condition, with no flexing observed.

The orange area consisted of blast rock fill that was placed on the subgrade and will be proof rolled at a later time.

The red area consists of blast rock fill that was put in place on the subgrade. Clay and boulder fill was already removed from this area and replaced with blast rock fill. The blast rock fill behaved appropriately during backfilling.

Recommendations

Due to the current condition of the wet mixed clay and boulder fill that is behaving poorly during proof rolling, it is recommended to remove this fill from the area within the building footprint of building A2 and A3. Once the subgrade is exposed, it should be reviewed and approved by a geotechnician from our office prior to backfilling. Backfill material should consist of blast rock fill up to 300 mm below USF and properly compacted and consolidated with a large steel drum roller. The first lift placed directly on the silty clay subgrade can be a maximum thickness of 500 mm, with each subsequent lifts being a maximum of 300 mm thick. The final lift, i.e. the final 300 mm below USF should consist of Granular B Type II compacted to 98 percent SPMDD and approved at the location of the footings. For the area below the slab on grade, the blast rock fill may be brought up to the USF elevation.

The fill in the area between building A2 and A3 (loading zone for the garbage bins) may remain in place. Once the material in this area is brought up to subgrade elevation, consideration should be given to placing of a woven geotextile and/or geogrid.

Additional Comments

- Additional compaction should be conducted with the large steel drum roller in the red and green areas prior to approval and subsequent backfilling. Lift thicknesses should be respected.
- Water should be pumped from the subgrade prior to backfilling with the blast rock fill. All subgrade should be reviewed and approved by a geotechnician from this office.

We trust that the information contained in this memo will be satisfactory for your purposes. Should you have any questions, please do not hesitate to contact the undersigned.

Best regards,

Paterson Group Inc.

Maxime Leroux, P.Eng.
Geotechnical Engineer / Project Manager

Attachments:
Site Sketch
Photos

Site Sketch

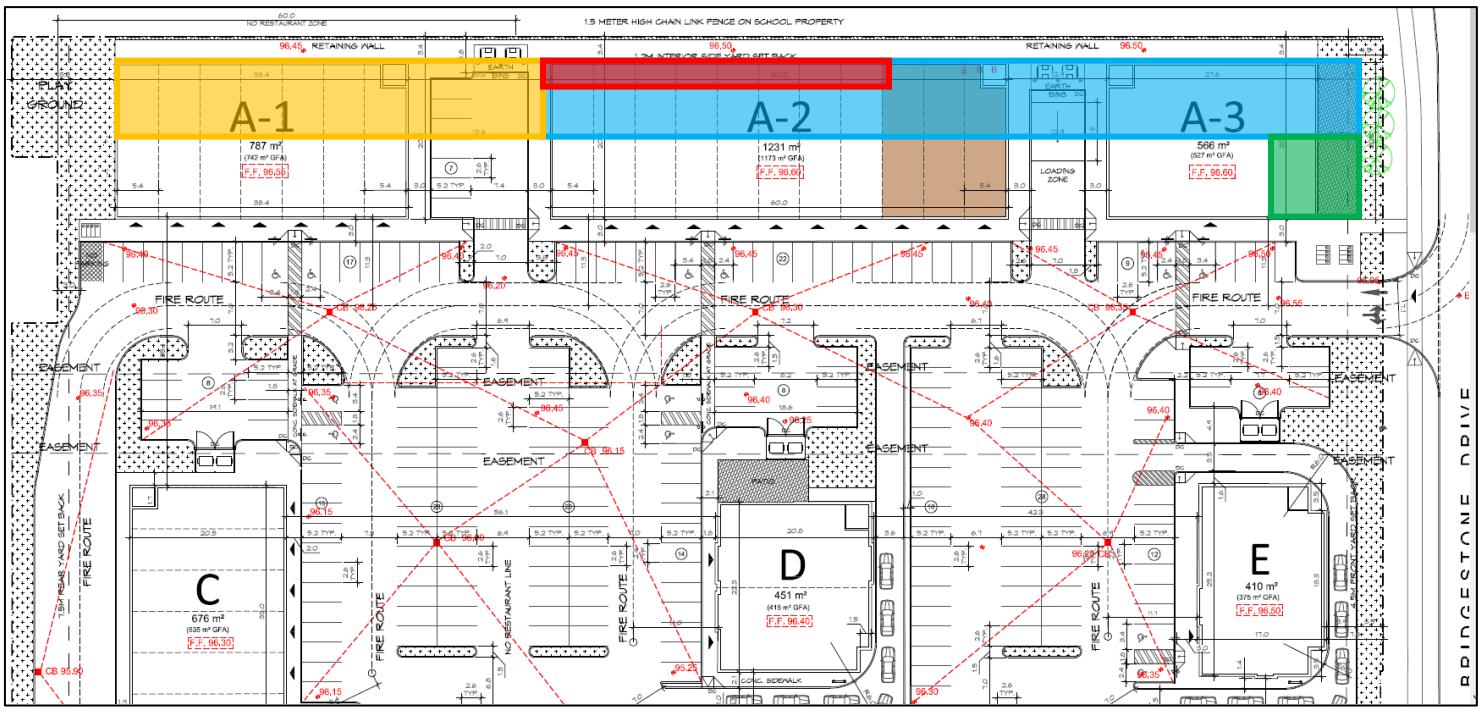
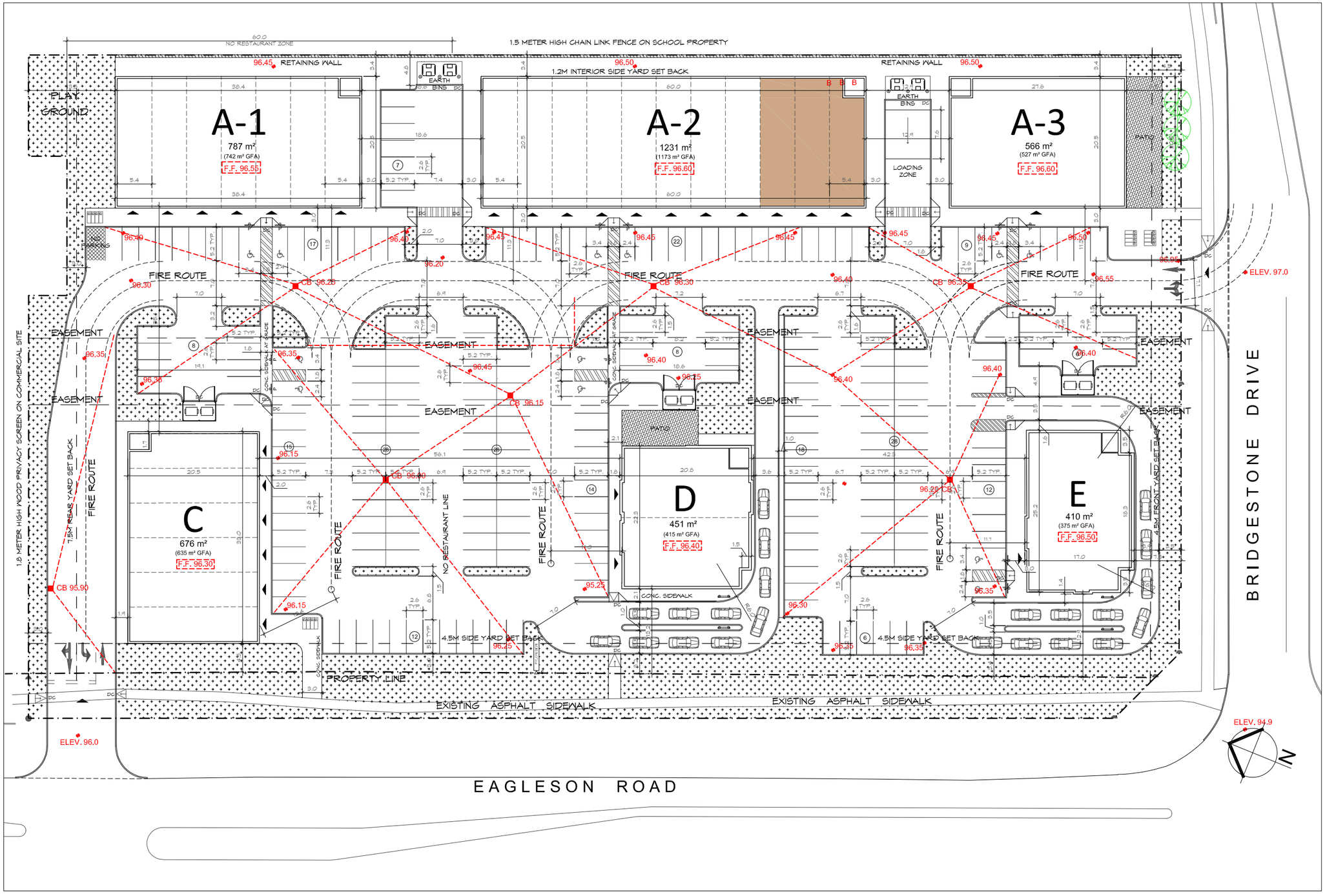

A-1
787 m²
(742 m² GFA)
F.F. 96.50
A-2
1231 m²
(1173 m² GFA)
F.F. 96.60
A-3
566 m²
(527 m² GFA)
F.F. 96.60
C
676 m²
(635 m² GFA)
F.F. 96.30
D
451 m²
(415 m² GFA)
F.F. 96.40
E
410 m²
(375 m² GFA)
F.F. 96.50
1.5 METER HIGH CHAIN LINK FENCE ON SCHOOL PROPERTY
RETAINING WALL
FIRE ROUTE
EASEMENT
LOADING ZONE
NO RESTAURANT ZONE
NO RESTAURANT LINE
CONC. SIDEWALK
BRIDGESTONE DRIVE

Photo 1: Mixed clay and boulder fill being proofrolled, major flexing observed. (November 24, 2021)

Photo 2: Stockpile of clay and boulder fill (November 24, 2021)

Photo 3: Significant water on subgrade in area of building A3 which was backfilled with clay and boulder fill prior to approval (November 19, 2021)

Photo 4: Test Pit Excavated in the clay and boulder fill, wet fill conditions observed (November 23, 2021)



SITE PLAN LEGEND

SYMBOL	DESCRIPTION
	BUILDING
	LANDSCAPED AREA
	CONCRETE SIDEWALK
	FIRE ROUTE
	RESTAURANT AREA
	PROPERTY LINE
	SETBACK LINE
	NEW CURB
DC	NEW DEPRESSED CURB
	BURIED HYDRO LINES
	ENTRANCE
LS	LAMP STANDARD
B	BOLLARD
S	SIGN
SP	EXISTING WATER STAND POST
96.0	ELEVATION MARKER
CB	CATCH BASIN
P	BARRIER FREE SIGN
F.F. 96.0	FINISH FLOOR ELEVATION
	ACCESSIBLE PARKING SPACE
	STANDARD PARKING SPACE (2.6 X 5.2 M.)
	REDUCED WIDTH PARKING SPACE (TYPE A (3.4 X 5.2 M) & TYPE B (2.4 X 5.2)
	NEW BIKE RACK
	PAINTED LINES

PARKING SPACES

TOTAL:	238

FLOOR AREA

GFA TOTAL:	3,867 m²
TOTAL:	4,121 m²

SITE AREA

TOTAL:	17,172 m²

801 EAGLESON - REVISED SITE PLAN

SCALE 1:600

17/11/2021

DREDGE LEAHY ARCHITECTS

Urbandale CORPORATION

patersongroup
consulting engineers

154 Colonnade Road South
Ottawa, Ontario, K2E 7J5
Tel: (613) 226-7381
Fax: (613) 226-6344
www.patersongroup.ca

Site Memorandum: Field Density Testing

TO: Urbandale Corporation DATE: Jan 13.2022 11:00 AM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See Attached).**

AUTHOR: Chris Green

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) was onsite from 11:00 a.m. - 2:00 p.m. and again at 4:00p.m. to conduct field density testing at the aforementioned location.

Reference:
This report should be read in-conjunction with Paterson's Site issued bearing medium evaluation for the noted location.

Field Density Testing: Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See Attached).
- Eighteen (18) field density tests were conducted (6 per lift) on the compacted Sandy Granular 'A' OPSS crushed stone.
- See attached site sketch for approximate location of today's tests.
- The yielded results all exceed 98.0% of the materials maximum dry density.

Conforming:
- Those results conform to the required 98.0% SPMDD.
- Contact Paterson for Field Density Testing on subsequent lift.

Observations / Recommendations:
-Test Pits dug into the granular pad revealed ~500mm of frost in the underlying material.
-When the contractor returns to site to excavate the granular pad to USF **it is Paterson's recommendation to re-consolidate the material with a highway roller** and contact Paterson for a proof roll inspection - prior to the forming of the footings.

PLEASE SEE FOLLOWING SHEETS FOR TEST RESULTS

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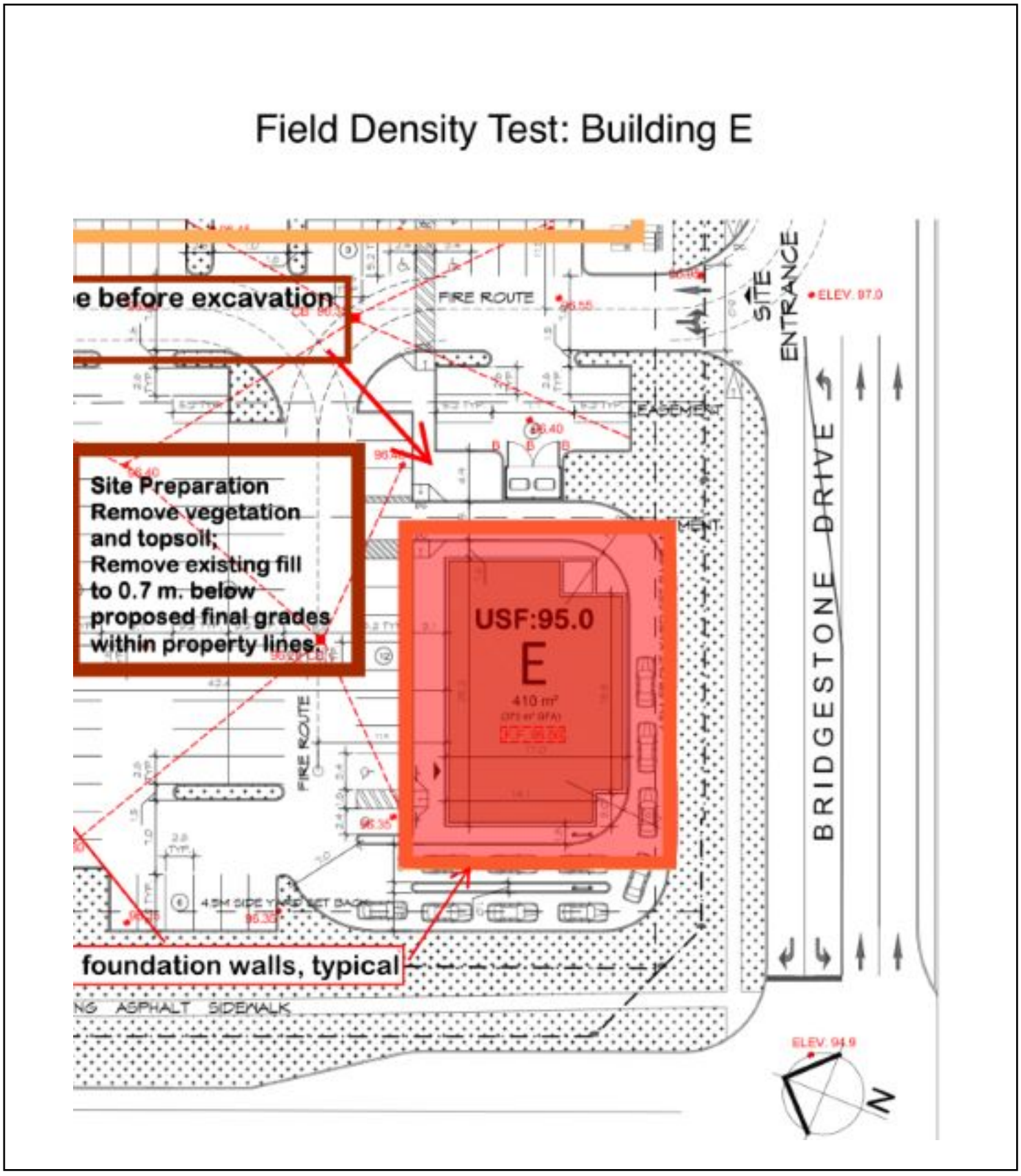
Site Memorandum: Field Density Testing

TEST LOCATION PLAN



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Site Memorandum: Field Density Testing

PHOTO 1

Lift @95.75m

PHOTO 2

Lift @95.10m

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Site Memorandum: Field Density Testing

MATERIALS

MATERIAL # 1	REFERENCE DENSITY (KG/M3)			
TYPE: Sandy Granular 'A'	MAX DRY DENSITY	OPTIMUM WATER (%)	CORRECTED MAX DRY DENSITY	STANDARD PROCTOR ASTM D 689 ☐<Value List Mis
				METHOD
SOURCE: Tomlinson - Moodie	2245			ESTIMATED PROCTOR ☐<Value List Missing>

COMPACTION REQUIRED % 98.0

GAGE SERIAL: 79622

TEST RESULTS

TEST #	MAT #	TEST LOCATION	ELEV (M)	DEPTH (M)	MOISTURE (%)	DRY DENSITY (KG/M3)	COMP. (%)	REMARKS
1	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.1	2247	100.1	Conforming
2	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.2	2238	99.7	Conforming
3	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.5	2223	99.0	Conforming
4	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.3	2272	101.2	Conforming
5	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.8	2254	100.4	Conforming
6	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.10	0.15	4.4	2243	99.9	Conforming
7	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	4.1	2236	99.6	Conforming
8	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	4.0	2241	99.8	Conforming
9	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	4.5	2274	101.3	Conforming
10	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	4.2	2232	99.4	Conforming
11	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	4.4	2243	99.9	Conforming
12	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.45	0.15	3.9	2220	98.9	Conforming
13	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.7	2241	99.8	Conforming
14	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.2	2220	98.9	Conforming
15	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.4	2236	99.6	Conforming
16	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.6	2245	100.0	Conforming
17	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.0	2216	98.7	Conforming
18	1	**Engineered Fill: Building E - Underside of Slab - @95.10, 95.45, & 95.75m - (See**	95.75	0.15	4.1	2227	99.2	Conforming

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Site Memorandum: Field Density Testing

TO: Urbandale Corporation DATE: Jan 14.2022 10:45 AM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**

AUTHOR: Chris Green

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) was onsite to conduct field density testing at the aforementioned location.

Reference:
This report should be read in conjunction with Paterson's Site issued bearing medium evaluation for the noted location.
Additionally, refer to the recommendations in **Field Density Test Memo #1** when excavating to USF.

Field Density Testing: Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).
- Six (6) field density tests were conducted on the compacted Sandy Granular 'A' OPSS crushed stone.
- See attached site sketch for approximate location of today's tests.
- The yielded results all exceed 98.0% of the materials maximum dry density.

Conforming:
- Those results conform to the required 98.0% SPMDD.

PLEASE SEE FOLLOWING SHEETS FOR TEST RESULTS

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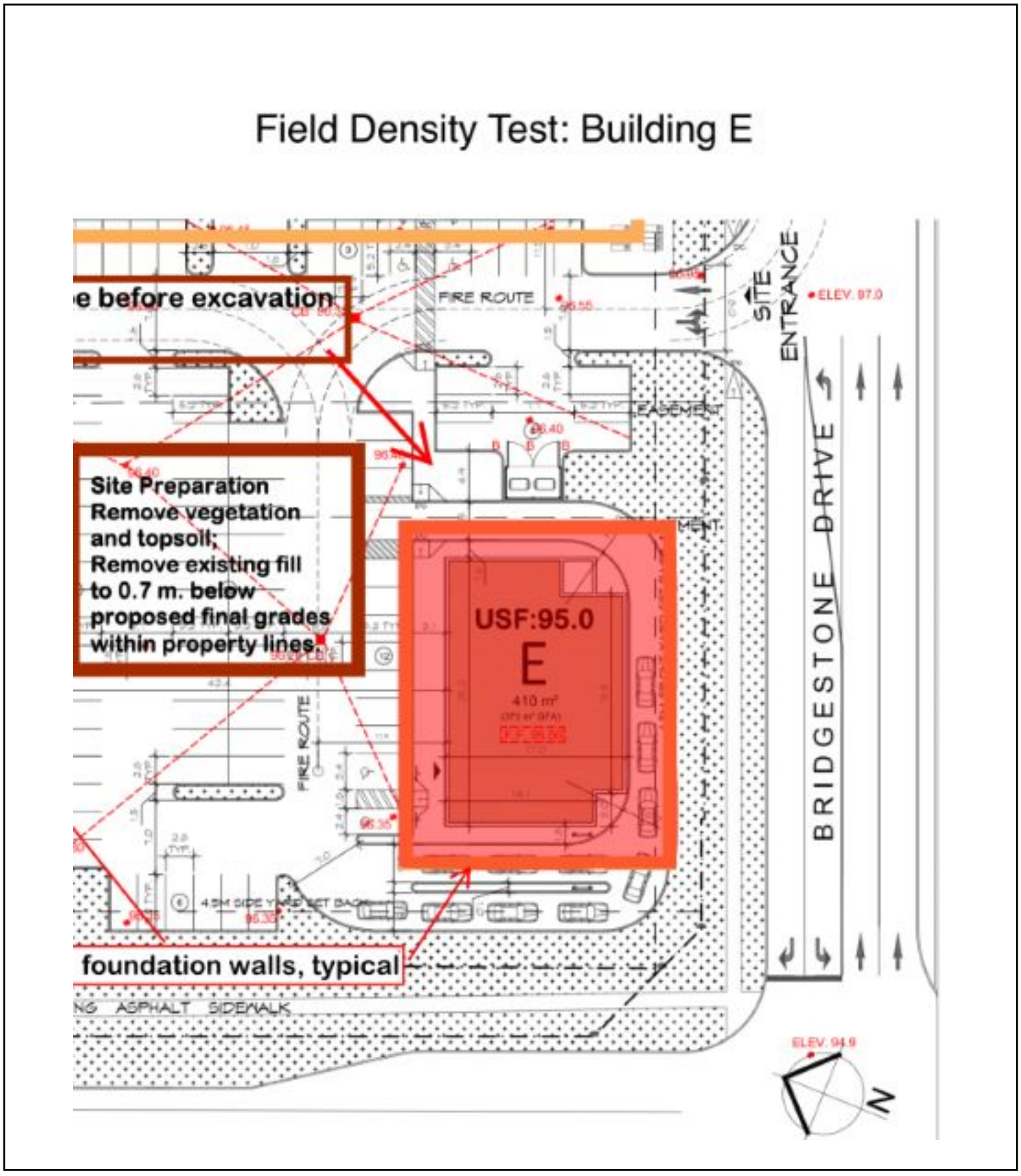
Site Memorandum: Field Density Testing

TEST LOCATION PLAN



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Site Memorandum: Field Density Testing

PHOTO 1

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Site Memorandum: Field Density Testing

MATERIALS

MATERIAL # 1	REFERENCE DENSITY (KG/M3)			
TYPE: Sandy Granular 'A'	MAX DRY DENSITY	OPTIMUM WATER (%)	CORRECTED MAX DRY DENSITY	STANDARD PROCTOR ASTM D 689 ☐<Value List Mis
				METHOD
SOURCE: Tomlinson - Moodie	2245			ESTIMATED PROCTOR ☐<Value List Missing>

COMPACTION REQUIRED % 98.0

GAGE SERIAL:	79622

TEST RESULTS

TEST #	MAT #	TEST LOCATION	ELEV (M)	DEPTH (M)	MOISTURE (%)	DRY DENSITY (KG/M3)	COMP. (%)	REMARKS
1	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	3.4	2223	99.0	Conforming
2	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	3.3	2227	99.2	Conforming
3	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	3.9	2243	99.9	Conforming
4	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	3.0	2252	100.3	Conforming
5	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	3.9	2223	99.0	Conforming
6	1	**Engineered Fill: Building E - Underside of Slab - @96.0m (top lift) - (See Attached).**	Top Lift	0.15	4.1	2214	98.6	Conforming

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Site Memorandum: Field Density Testing

TO: Urbandale Corporation DATE: Aug 17.2022 3:30 PM FILE: PM13772

PROJECT: 801 Eagleson - Commercial Plaza

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Retaining Wall Base - East Side - See Attached Sketch**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection to conduct field density testing at the aforementioned location.

Retaining Wall Base - East Side - See Attached Sketch

Testing Results

A total of five (5) field density tests were conducted on an OPSS crushed stone Granular B Type 2.

The results all exceeded 98% of the materials maximum dry density.

Conforming

These results fully conform to the specified 98% standard proctor minimum requirement.

Call to schedule additional compaction testing.

PLEASE SEE FOLLOWING SHEETS FOR TEST RESULTS

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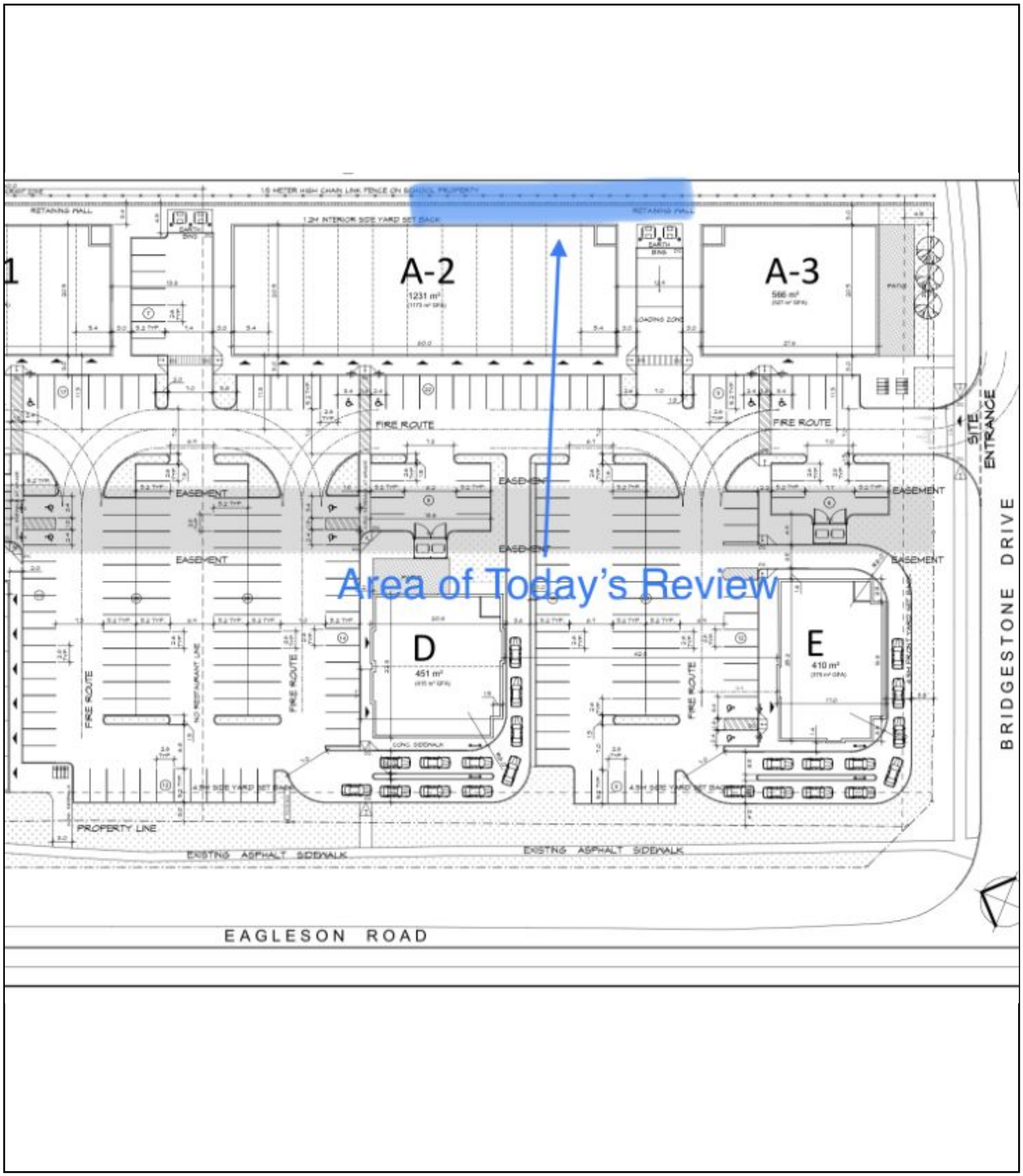
Site Memorandum: Field Density Testing

TEST LOCATION PLAN



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Site Memorandum: Field Density Testing

PHOTO 1

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Site Memorandum: Field Density Testing

MATERIALS

MATERIAL # 1	**REFERENCE DENSITY (KG/M3)**			
TYPE: Granular "B" Type 2	MAX DRY DENSITY	OPTIMUM WATER (%)	CORRECTED MAX DRY DENSITY	STANDARD PROCTOR ASTM D 689 ☐<Value List Mis
				METHOD
SOURCE: Tomlinson		3.4	2315	ESTIMATED PROCTOR ☐<Value List Missing>

COMPACTION REQUIRED % 98.0

GAGE SERIAL:	3525

TEST RESULTS

TEST #	MAT #	TEST LOCATION	ELEV (M)	DEPTH (M)	MOISTURE (%)	DRY DENSITY (KG/M3)	COMP. (%)	REMARKS
T1	1	**Retaining Wall Base - East Side - See Attached Sketch**	1st lift	0.1	2.4	2276	98.3	Conforming
T2	1	**Retaining Wall Base - East Side - See Attached Sketch**	1st lift	0.1	2.1	2285	98.7	Conforming
T3	1	**Retaining Wall Base - East Side - See Attached Sketch**	1st lift	0.1	1.8	2299	99.3	Conforming
T4	1	**Retaining Wall Base - East Side - See Attached Sketch**	1st lift	0.1	2.2	2294	99.1	Conforming
T5	1	**Retaining Wall Base - East Side - See Attached Sketch**	1st lift	0.1	2.5	2303	99.5	Conforming

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Site Memorandum: Field Density Testing

TO: Urbandale Corporation DATE: Aug 19.2022 3:30 PM FILE: PM13772

PROJECT: 801 Eagleson - Commercial Plaza

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Retaining Wall Base - East Side - See Attached Sketch**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection to conduct field density testing at the aforementioned location.

Retaining Wall Base - East Side - See Attached Sketch

Testing Results

A total of eight (8) field density tests were conducted on an OPSS crushed stone Granular B Type 2.

The results all exceeded 98% of the materials maximum dry density.

Conforming

These results fully conform to the specified 98% standard proctor minimum requirement.

Two visit were done 10:00am & 3:45pm

PLEASE SEE FOLLOWING SHEETS FOR TEST RESULTS

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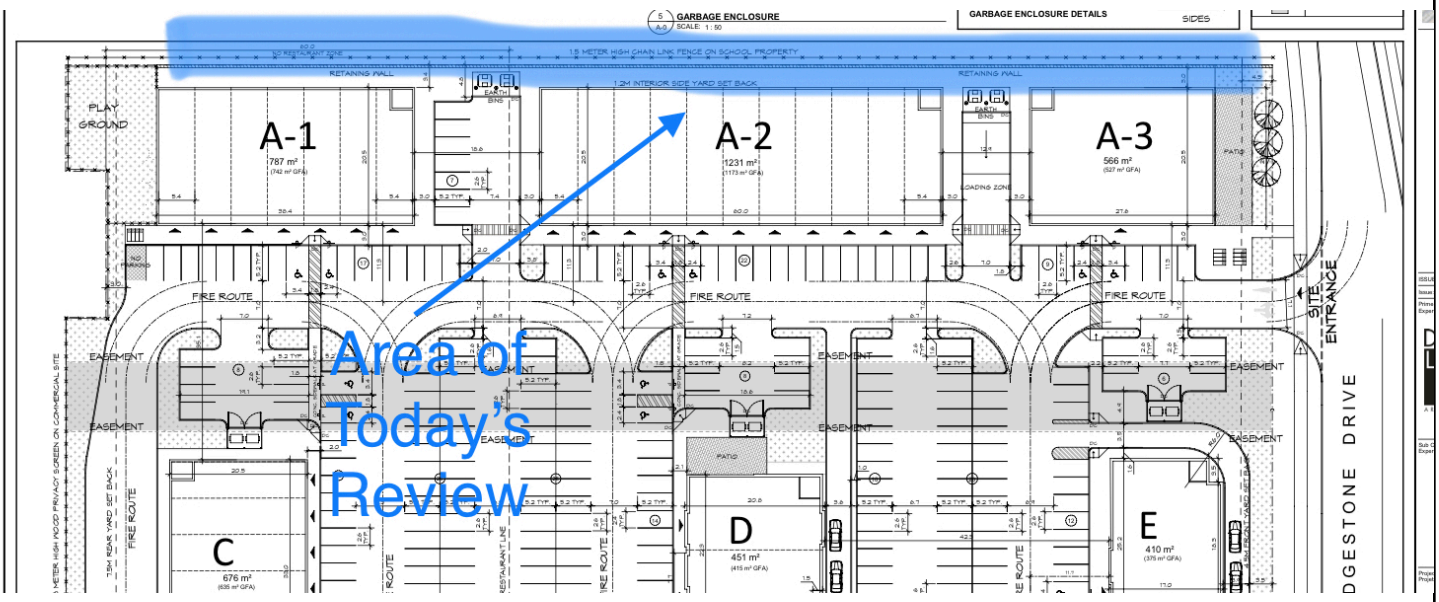
Site Memorandum: Field Density Testing

TEST LOCATION PLAN



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Site Memorandum: Field Density Testing

PHOTO 1

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Site Memorandum: Field Density Testing

MATERIALS

MATERIAL # 1	REFERENCE DENSITY (KG/M3)			
TYPE: Granular "B" Type 2	MAX DRY DENSITY	OPTIMUM WATER (%)	CORRECTED MAX DRY DENSITY	STANDARD PROCTOR ASTM D 689 ☐<Value List Mis
				METHOD
SOURCE: Tomlinson		3.4	2315	ESTIMATED PROCTOR ☐<Value List Missing>

COMPACTION REQUIRED % 98.0

GAGE SERIAL:	3525

TEST RESULTS

TEST #	MAT #	TEST LOCATION	ELEV (M)	DEPTH (M)	MOISTURE (%)	DRY DENSITY (KG/M3)	COMP. (%)	REMARKS
T1	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.4	2296	99.2	Conforming
T2	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.2	2276	98.3	Conforming
T3	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.0	2283	98.6	Conforming
T4	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.4	2271	98.1	Conforming
T5	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.9	2290	98.9	Conforming
T6	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.0	2283	98.6	Conforming
T7	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.3	2276	98.3	Conforming
T8	1	**Retaining Wall Base - East Side - See Attached Sketch**	Base	0.1	2.5	2283	98.6	Conforming

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Site Memorandum

TO:	Urbandale Corporation	DATE: Nov 19.2021	3:30 PM	FILE: PM13772
PROJECT:	Bridgestone at Eagleson Plaza - Site Excavation			
ADDRESS:	801 Eagleson Road , Kanata			
LOCATION:	**Subgrade Review - Building A1, A2 & A3**			
AUTHOR:	Mahmoud Iskandar	CONTRACTOR:	Tomlinson	

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1, A-2 & A-3

Observations

The subgrade consists of an undisturbed, native grey silty clay.

At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

A-3 : At the time of inspection, the area marked in red was excavated Approximately 1.0 m below USF as per contractor, the area was backfilled with crushed stone/blast rock. The area was covered in water therefore A Subgrade review was not possible.

A-2 : At the time of inspection, The area marked in blue was excavated approximately 0.6 m below USF as per contractor. Half of the right side of the building was covered with water therefore a subgrade review was not possible

A-1 : At the time of inspection the area marked in green consisted of native gray silty clay approximately 0.3 m below USF.

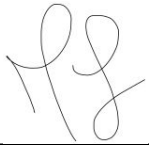
Multiple elevation shots have been taken Between building A-2 and building A-1 at the time of review, and they are as follow:

Elevations: 94.650, 94.660, 94.700 & 94.730 , Proposed Elevation: 95.1

Recommendations

- Engineered fill such as a well graded blast rock can be placed up to lifts of 450mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support. The upper 150mm directly below USF should consist of an OPSS granular A and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.

Note : The area noted in Green as A-1 was backfilled in 0.5 m deep of water prior to approval from Paterson. The material should be removed and the subgrade should be approved prior to backfilling. The material used for backfilled should be reviewed to verify that it is not too wet for placement as it was originally placed in 500 mm thick of water.



MAHMOUD ISKANDAR

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Site Memorandum

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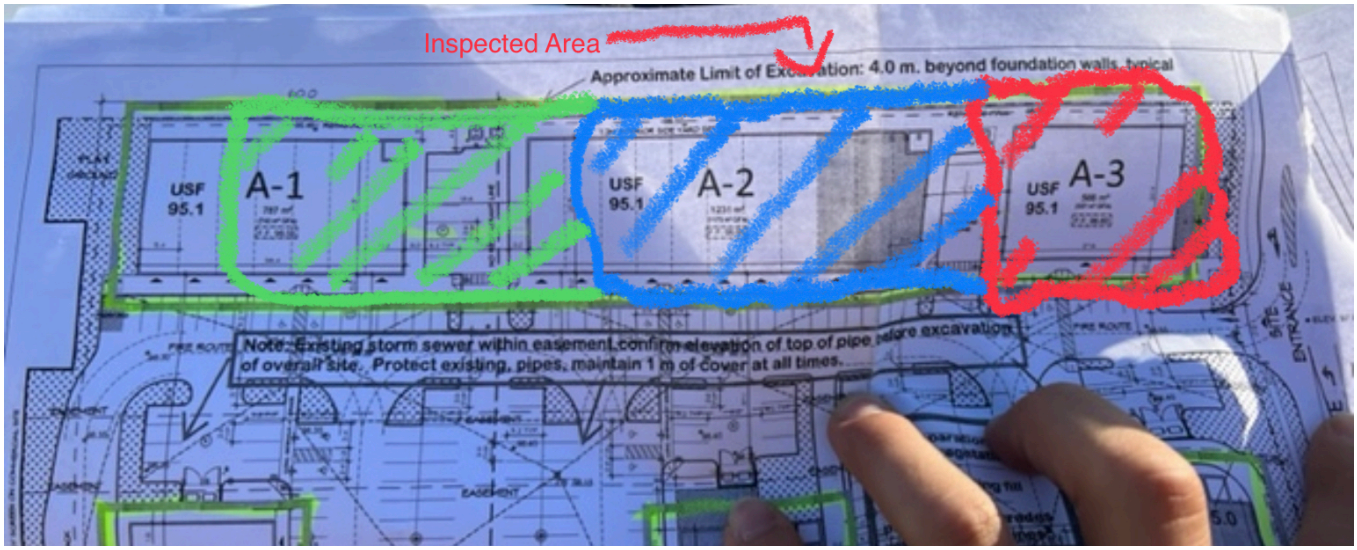
SITE SKETCH



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Site Memorandum

PHOTO1

PHOTO2

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Site Memorandum

PHOTO3

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Site Memorandum

TO: Urbandale Corporation
DATE: Nov 22.2021 2:00 PM
FILE: PM13772
PROJECT: Bridgestone at Eagleson Plaza - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review - Building A1, A2 & A3**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1, A-2 & A-3

Observations

The subgrade consists of an undisturbed, native grey silty clay.

At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

A-3 : At the time of inspection multiple test pits have been excavated and native Silty grey clay was found approximately 600 MM to 900 MM below USF.

A-2 : Fill material was being placed, The fill consisted of blast rock, clay, big boulders and some organic material such as big tree branches and roots.

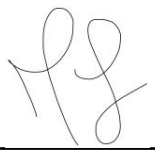
A-1 : Inspection was not possible at the time of review due to excessive water collected on the subgrade.

Area marked in yellow: Area not excavated yet .

Recommendations

- Engineered fill such as a well graded blast rock can be placed up to lifts of 450mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support. The upper 150mm directly below USF should consist of an OPSS granular A and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



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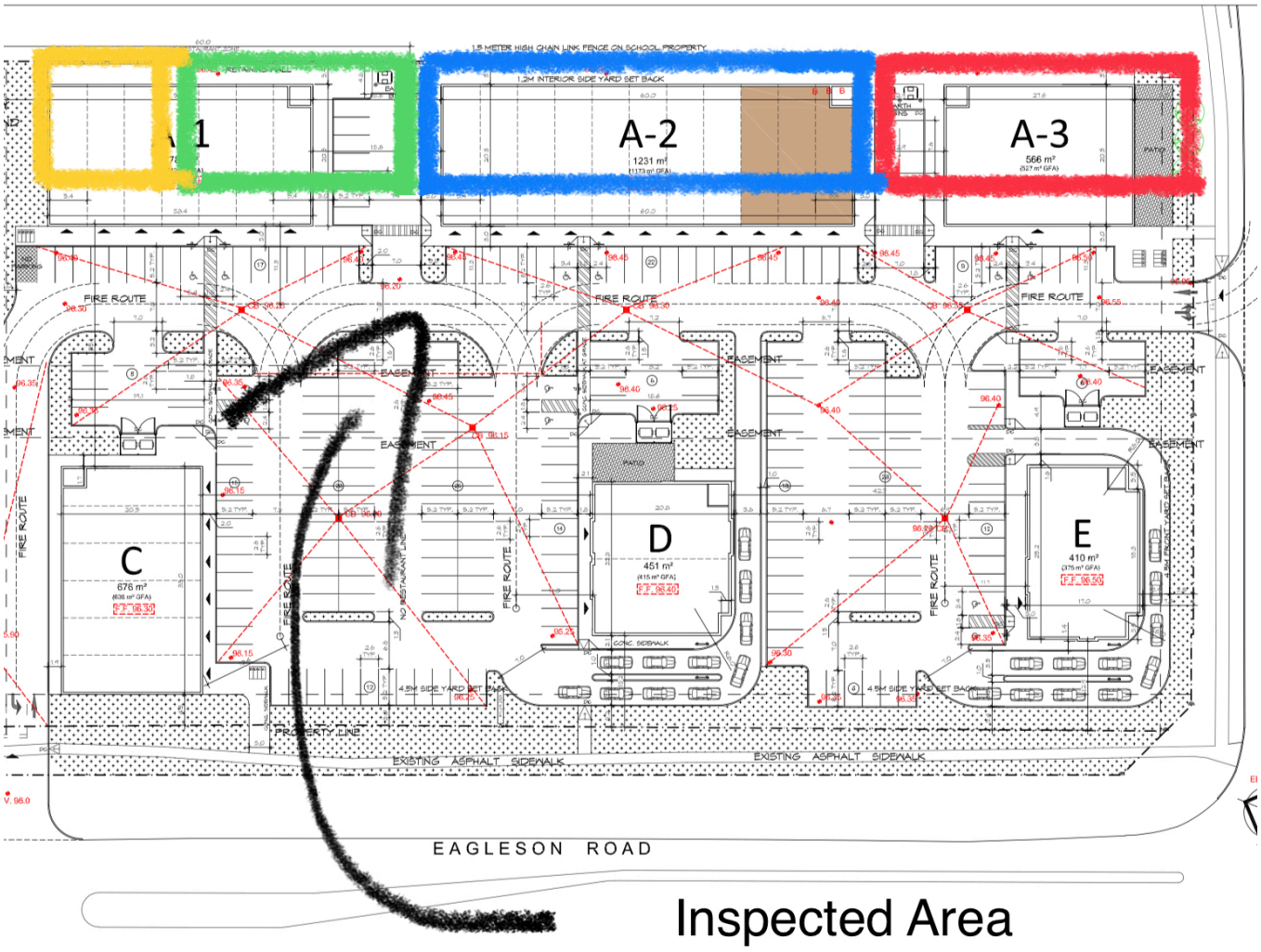
Site Memorandum

SITE SKETCH



ESON - REVISED SITE PLAN SC/

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Site Memorandum

PHOTO1

PHOTO2

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PHOTO3

PHOTO4

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PHOTO5

PHOTO6

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PHOTO7

PHOTO8

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Site Memorandum

TO: Urbandale Corporation
DATE: Nov 23.2021 3:00 PM
FILE: PM13772
PROJECT: Bridgestone at Eagleson Plaza - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review - Building A1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1

Observations

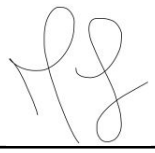
At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

A-1 : At the time of inspection the subgrade was +/- 300 MM below yourself the subgrade consist of understood native gray silty clay

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



MAHMOUD ISKANDAR

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Site Memorandum

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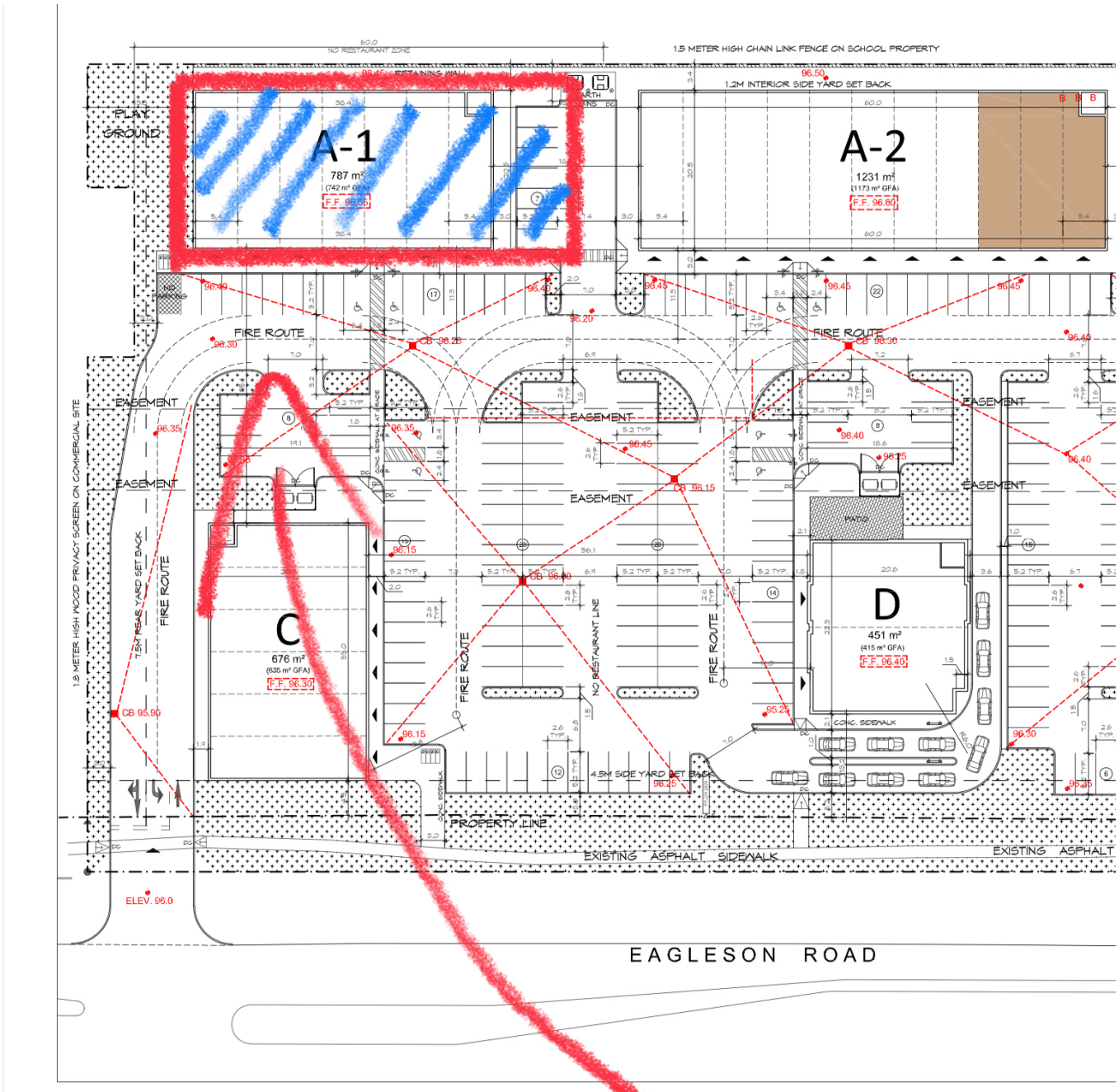
SITE SKETCH



801 EAGLESON - REVISED SITE PLAN

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Site Memorandum

PHOTO1

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Site Memorandum

TO: Urbandale Corporation
DATE: Nov 23.2021 3:00 PM
FILE: PM13772
PROJECT: Bridgestone at Eagleson Plaza - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review - Building A1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1

Observations

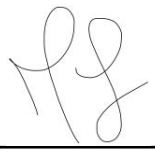
At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

A-1 : At the time of inspection the subgrade was +/- 300 MM below USF, the subgrade consist of Undisturbed
native gray silty clay

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



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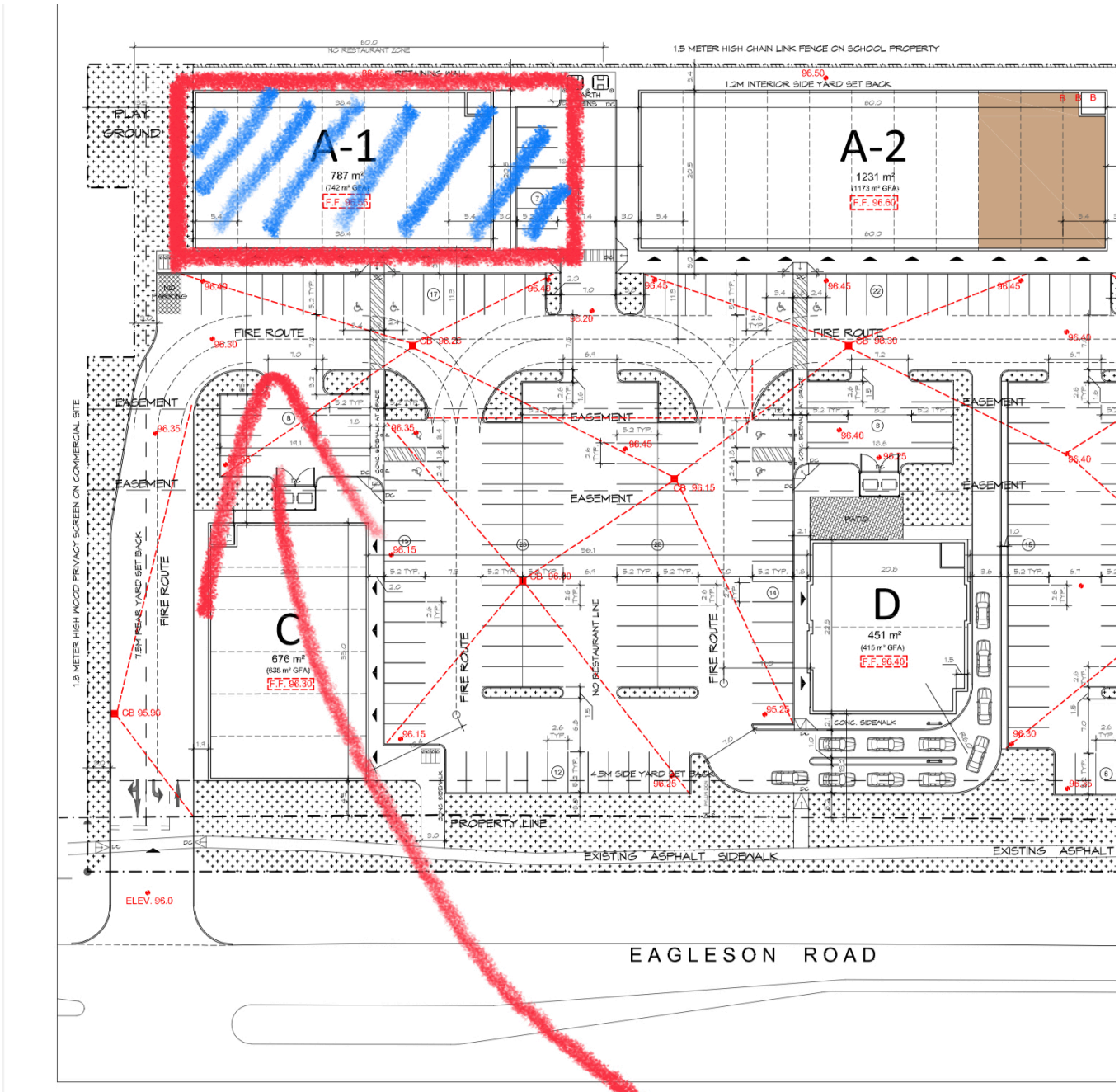

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PHOTO1

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Site Memorandum

TO: Urbandale Corporation DATE: Nov 24.2021 3:00 PM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building A1 & A-3 (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1 & A-3 (See Sketch Attached)

Observations

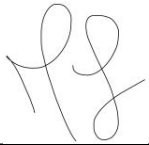
At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

At the time of inspection the subgrade was +/- 300 MM below USF, the subgrade consist of Undisturbed native grey silty clay within the footing perimeter.
The rest of the subgrade is at USF elevation.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



MAHMOUD ISKANDAR

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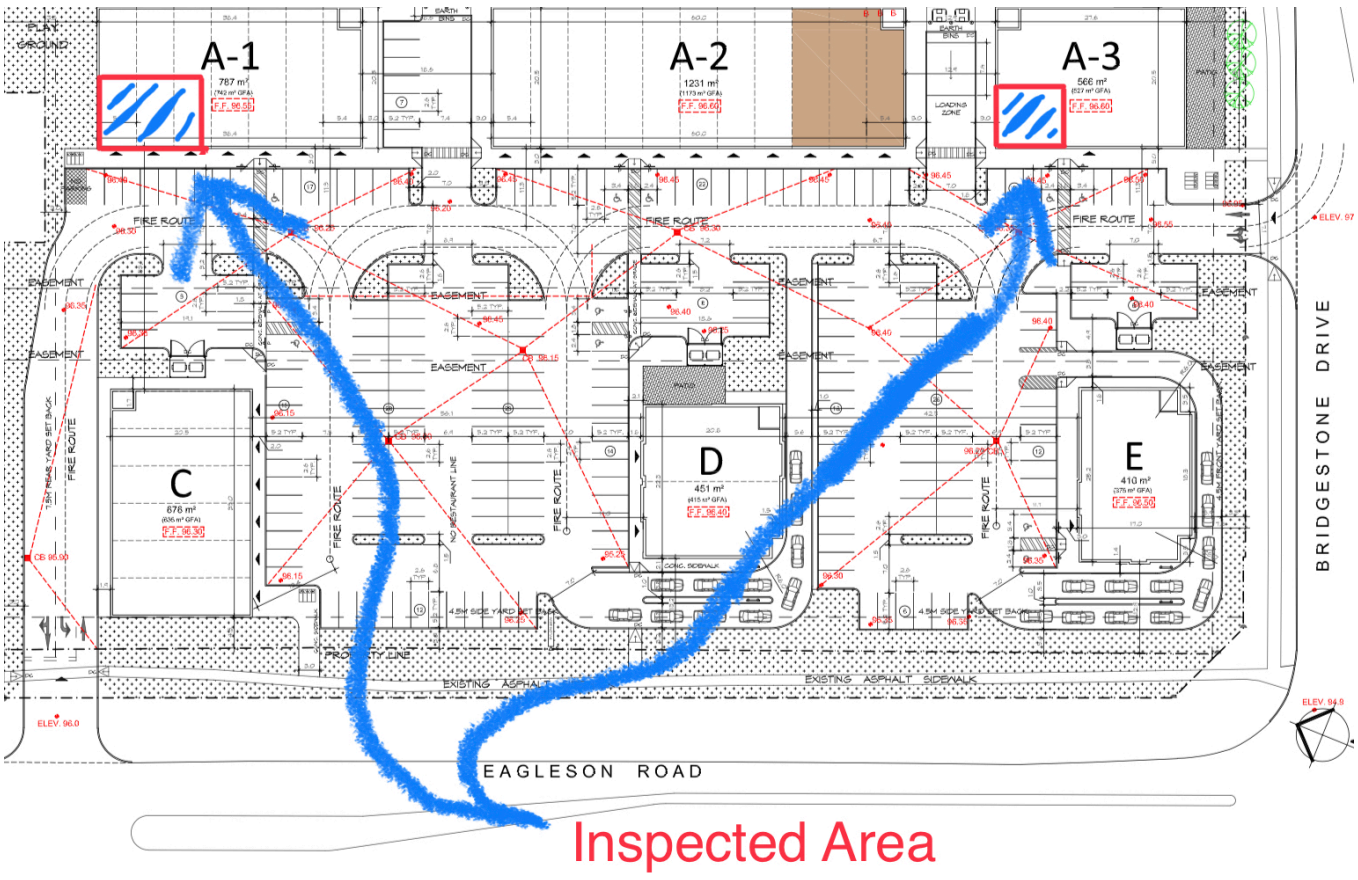

:AGLESON - REVISED SITE PLAN SCALE 1

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Site Memorandum

PHOTO1

PHOTO2

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PHOTO3

PHOTO4

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Site Memorandum

TO: Urbandale Corporation
DATE: Nov 24.2021 7:04 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-2 & A-3**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-3 & A-2

Proof Roll Review - View Attached Highlighted Sketch For Locations

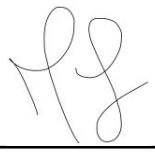
At the time of the review, the building Pads were prepared and cut in preparation for the placement of the second lift . The building pad consisted of silty clay with gravel and boulder fill and Some organics were observed. A proof roll was conducted with a Smooth Drum roller and heavy deflection was observed.

Non - Conforming

The above noted area is considered non-conforming due to heavy flexing of the inspected material.

Recommendations & Remarks

- Removing all saturated material .
- Replace all existing material with well graded blast rock.
- The fill in the area between building A2 and A3 (loading zone for the garbage bins) may remain in place. Once the material in this area is brought up to subgrade elevation, consideration should be given to placing of a woven geotextile and/or geogrid.



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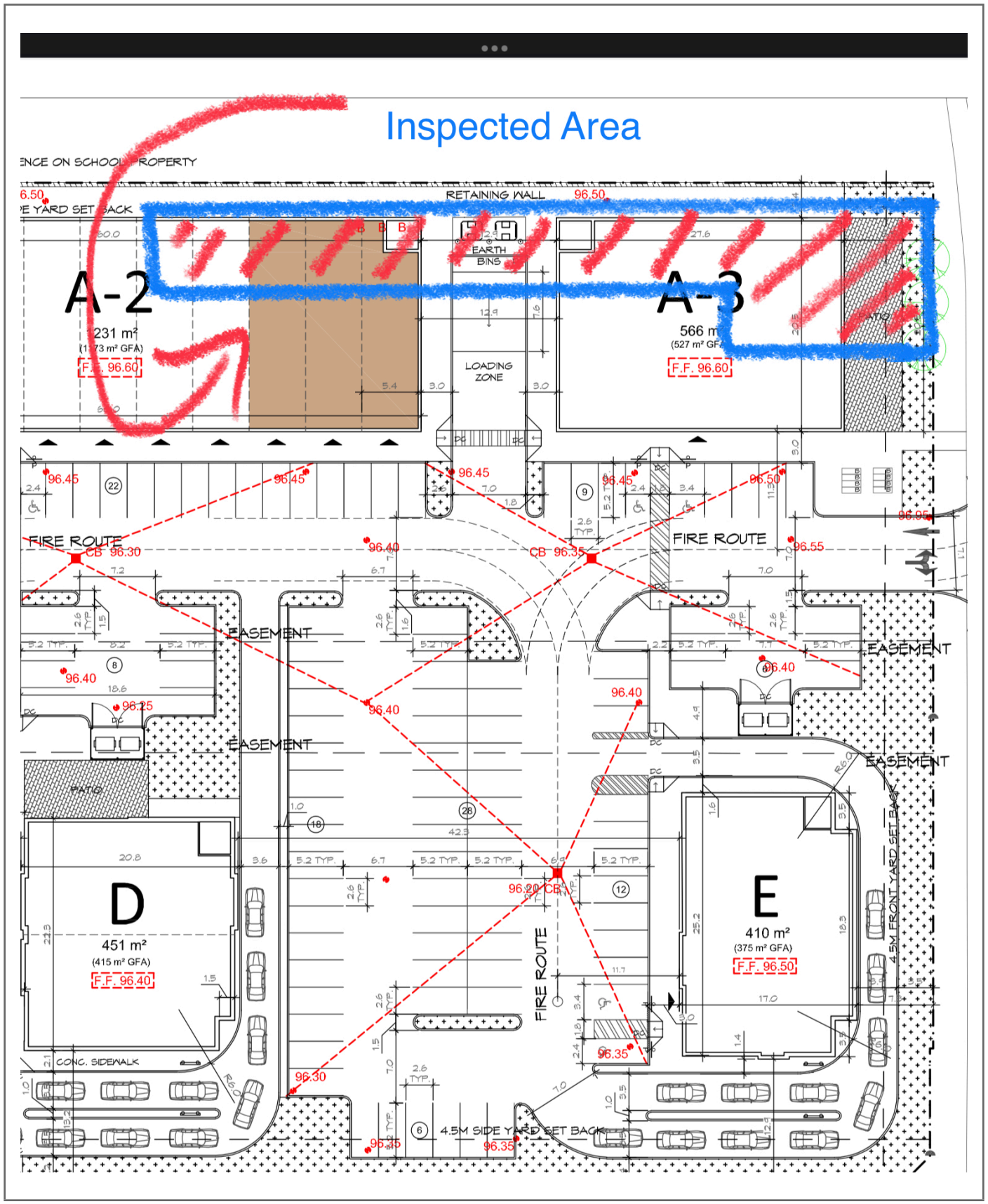

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Site Memorandum

PHOTO1

PHOTO2

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Site Memorandum

TO: Urbandale Corporation DATE: Nov 30.2021 10:00 AM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building A1 & Parking Lot (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1 & Parking lot (See Sketch Attached)

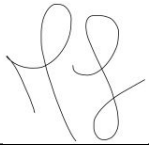
Observations

The Area marked in green : At the time of inspection the area was excavated +/- 600mm above USF.
It is Paterson understanding that the subgrade was left 600 mm above USF to protect it from frost until Backfill process starts.

The Area marked in red : At the time of inspection contractor was excavating the Parking lot to Subgrade elevation.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.



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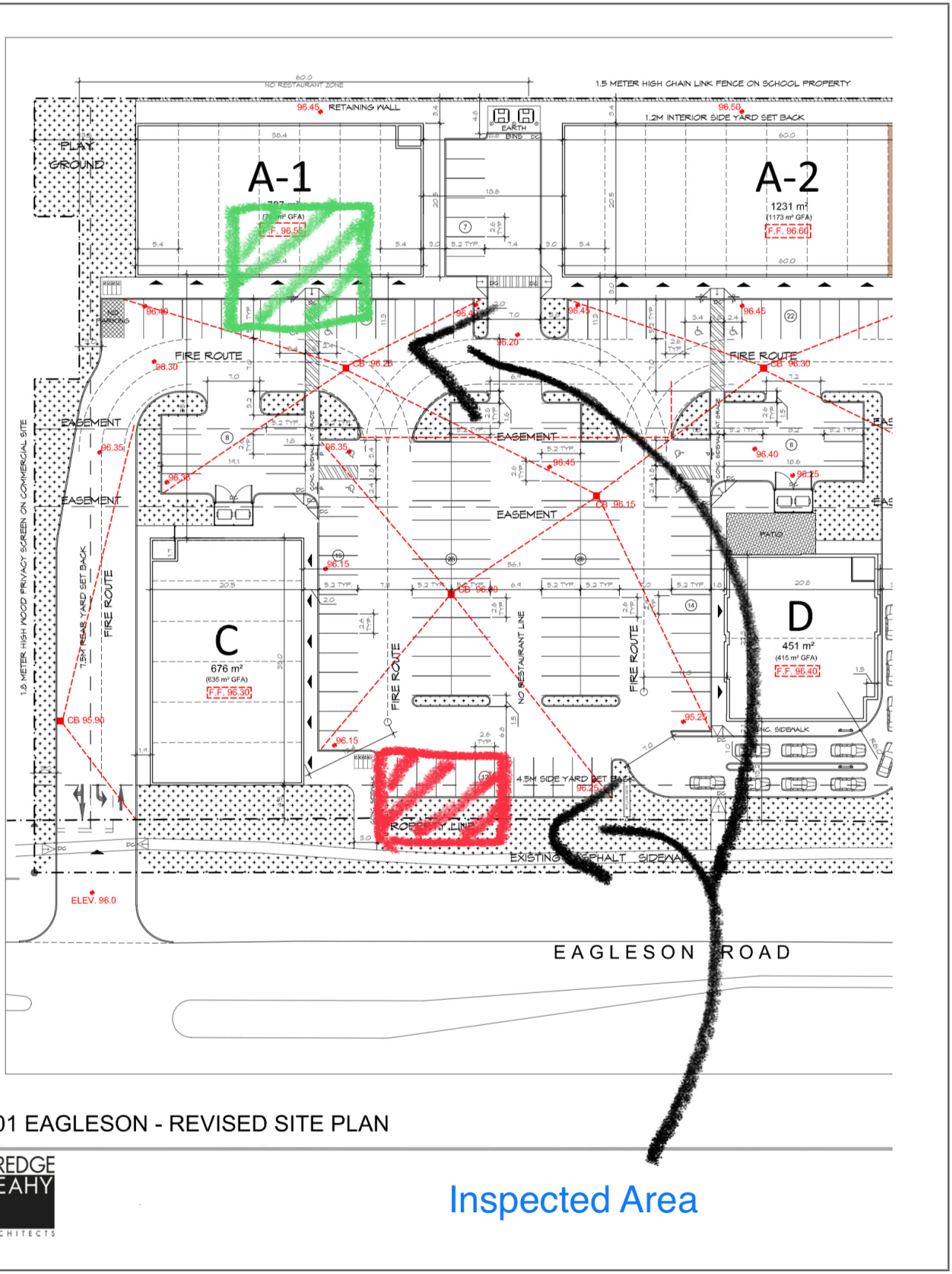

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Site Memorandum

PHOTO1

Parking Lot

PHOTO2

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Site Memorandum

PHOTO3

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 01.2021 11:00 AM FILE: PM13772
PROJECT: Bridgestone at Eagleson Plaza - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review - Building A1 (See sketch Attached)**
AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-1 (See Sketch Attached)

Observations

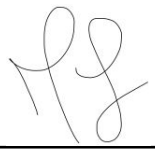
At the time of the review, the above noted lots were excavated to varying depths according to the site contact.

At the time of inspection the subgrade was +/- 400 MM below USF, the subgrade consist of Undisturbed native grey silty clay.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



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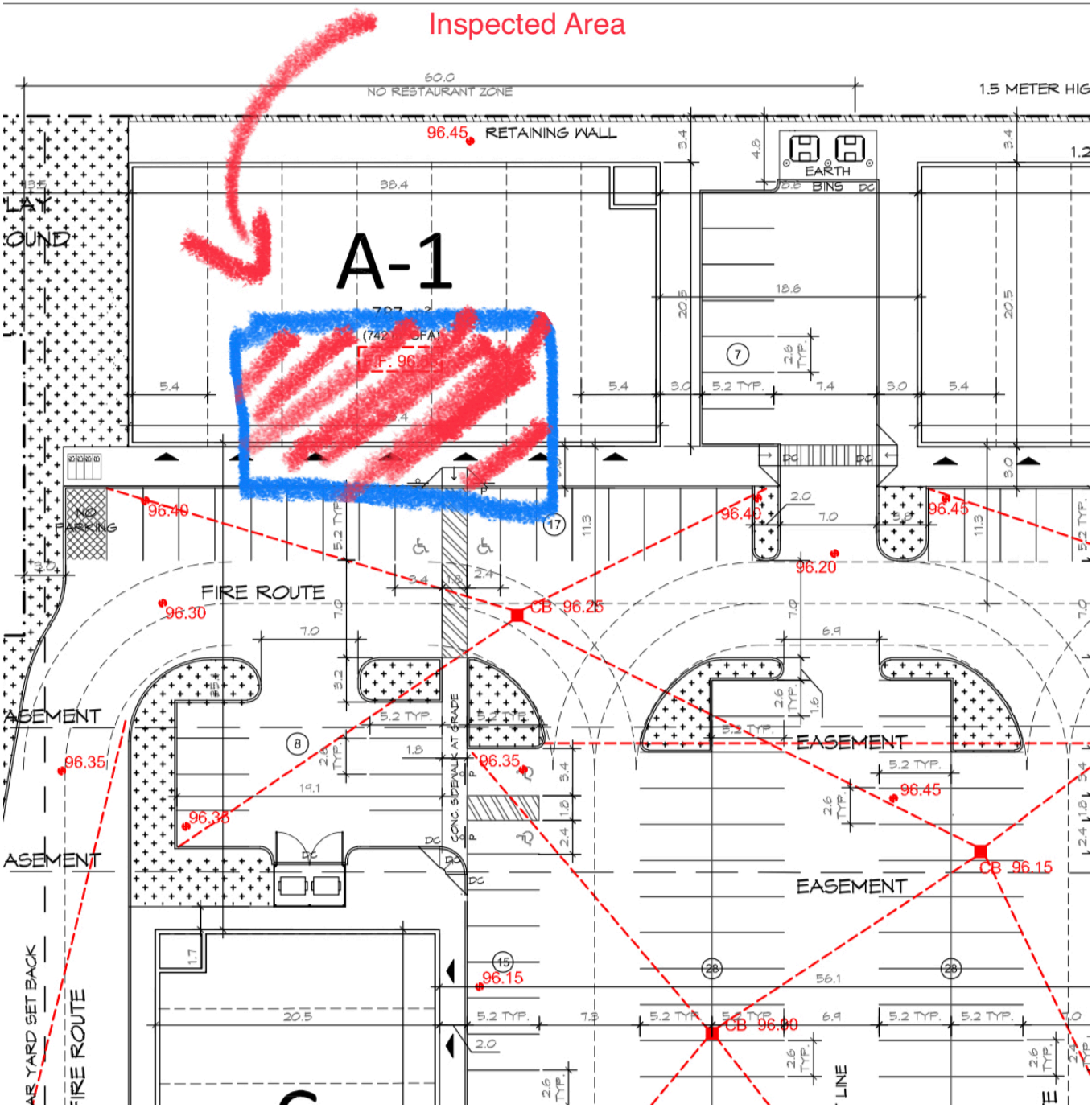

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Site Memorandum

PHOTO1

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 02.2021 9:04 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-1

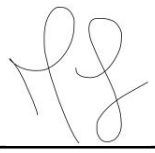
Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

Conforming

The above noted area is considered in general conformance.

It is Paterson understanding that engineered fill 5/8 will be used to cover all the surface to protect USF from winter weather conditions/frost .



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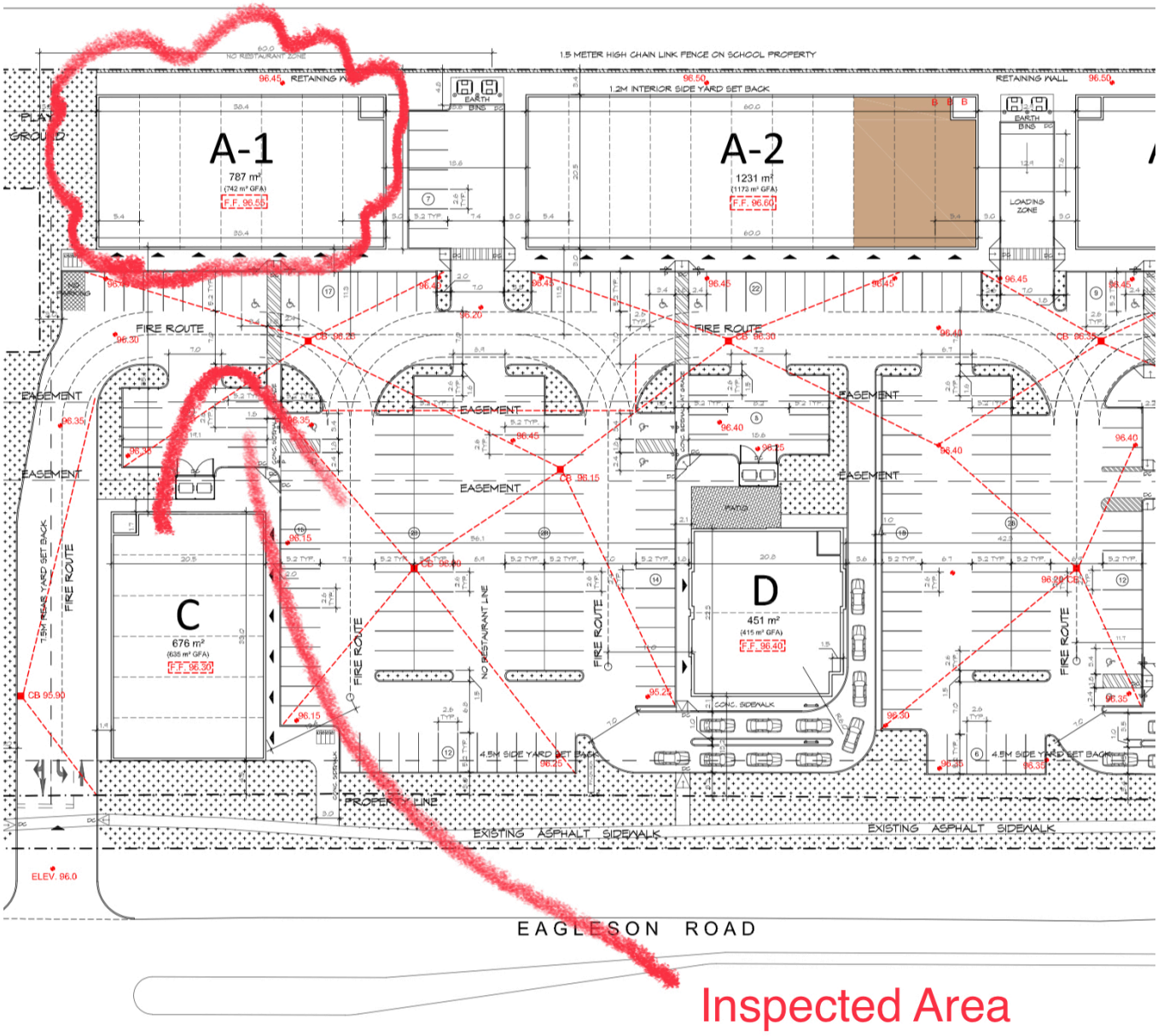

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Site Memorandum

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 02.2021 3:00 PM FILE: PM13772
PROJECT: Bridgestone at Eagleson Plaza - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review - Building A-2 (See sketch Attached)**
AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-2 (See Sketch Attached)

Observations

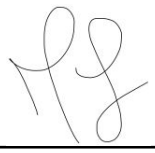
- At the time of the review, the above noted area was excavated to varying depths according to the site contact.
- Contractor was observed removing the heavily saturated silty clay with gravel and boulder material that was agreed upon by client & contractor and replaced with well graded engineered fill.

At the time of inspection the subgrade was +/- 400 MM below USF, the subgrade consist of Undisturbed native grey silty clay.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



MAHMOUD ISKANDAR

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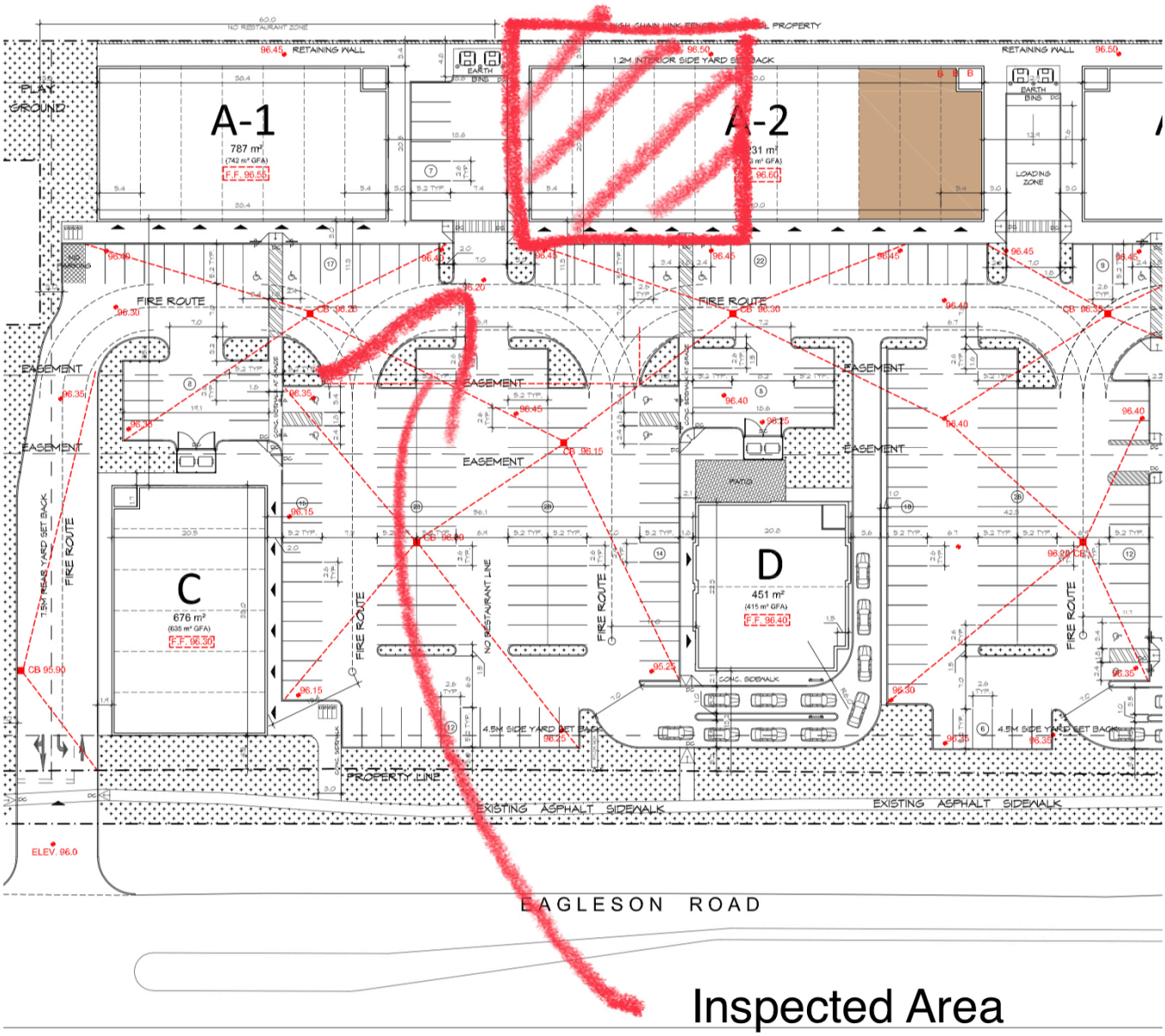

AGLESON - REVISED SITE PLAN

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 03.2021 12:30 PM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-1

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

It is Paterson understanding that there will be approximately 0.9m of fill required, therefore the backfill process will will be required in 3 (300mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the second lift and arrange for a proof roll review when ready.

MAHMOUD ISKANDAR

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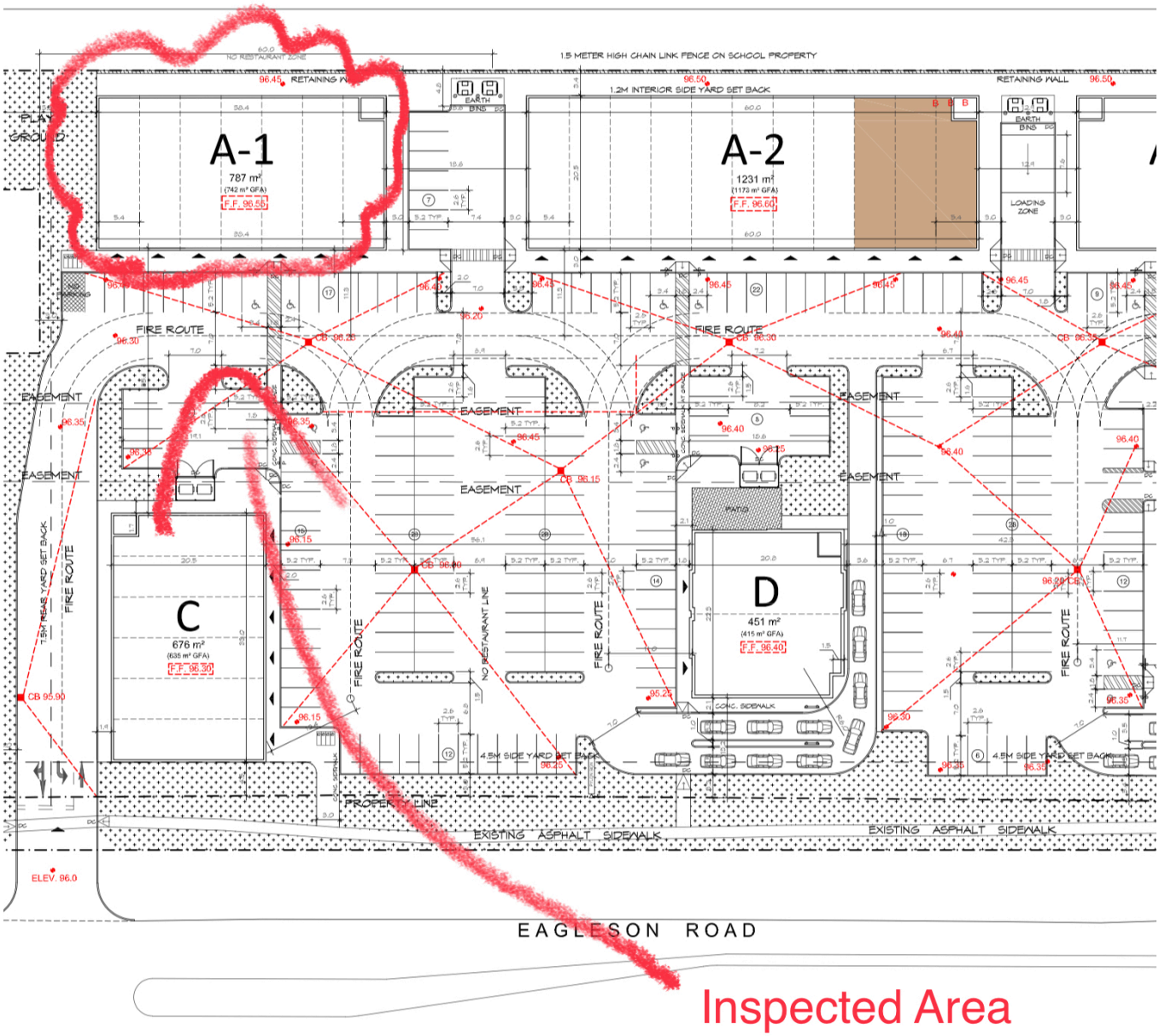

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Site Memorandum

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PHOTO2

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Site Memorandum

PHOTO3

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 07.2021 10:00 AM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building C (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

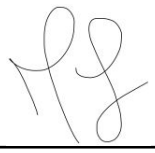
Subgrade Review - Building C (See Sketch Attached)

Observations

The Area marked in red : At the time of inspection the area was excavated +/- 600mm above USF. It is Paterson understanding that the subgrade was left 600 mm above USF to protect it from frost until Backfill process starts.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.



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Site Memorandum

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SITE SKETCH

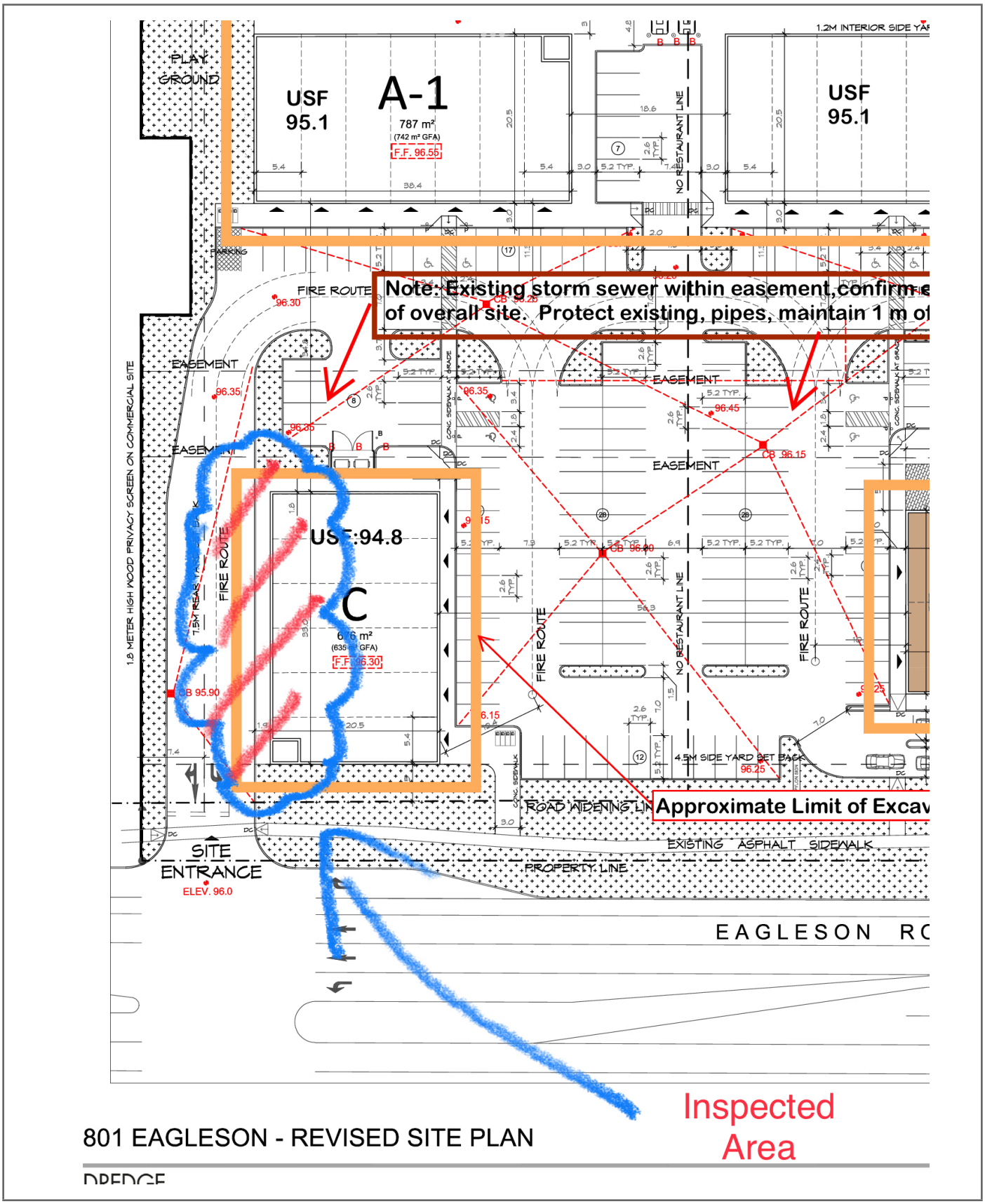

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PHOTO1

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 08.2021 4:00 PM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building A-2 (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-2 (See Sketch Attached)

Observations

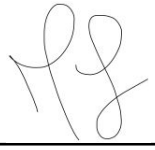
- At the time of the review, the above noted area was excavated to varying depths according to the site contact.
- Contractor was observed removing the heavily saturated silty clay with gravel and boulder material that was agreed upon by client & contractor and replaced with well graded engineered fill.

At the time of inspection the subgrade was +/- 400 MM below USF, the subgrade consist of Undisturbed native grey silty clay.
Note: The area where the old ditch/pipe used to pass there was excavated approximately +/- 1.8m below USF after removing all the organic and saturated material.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



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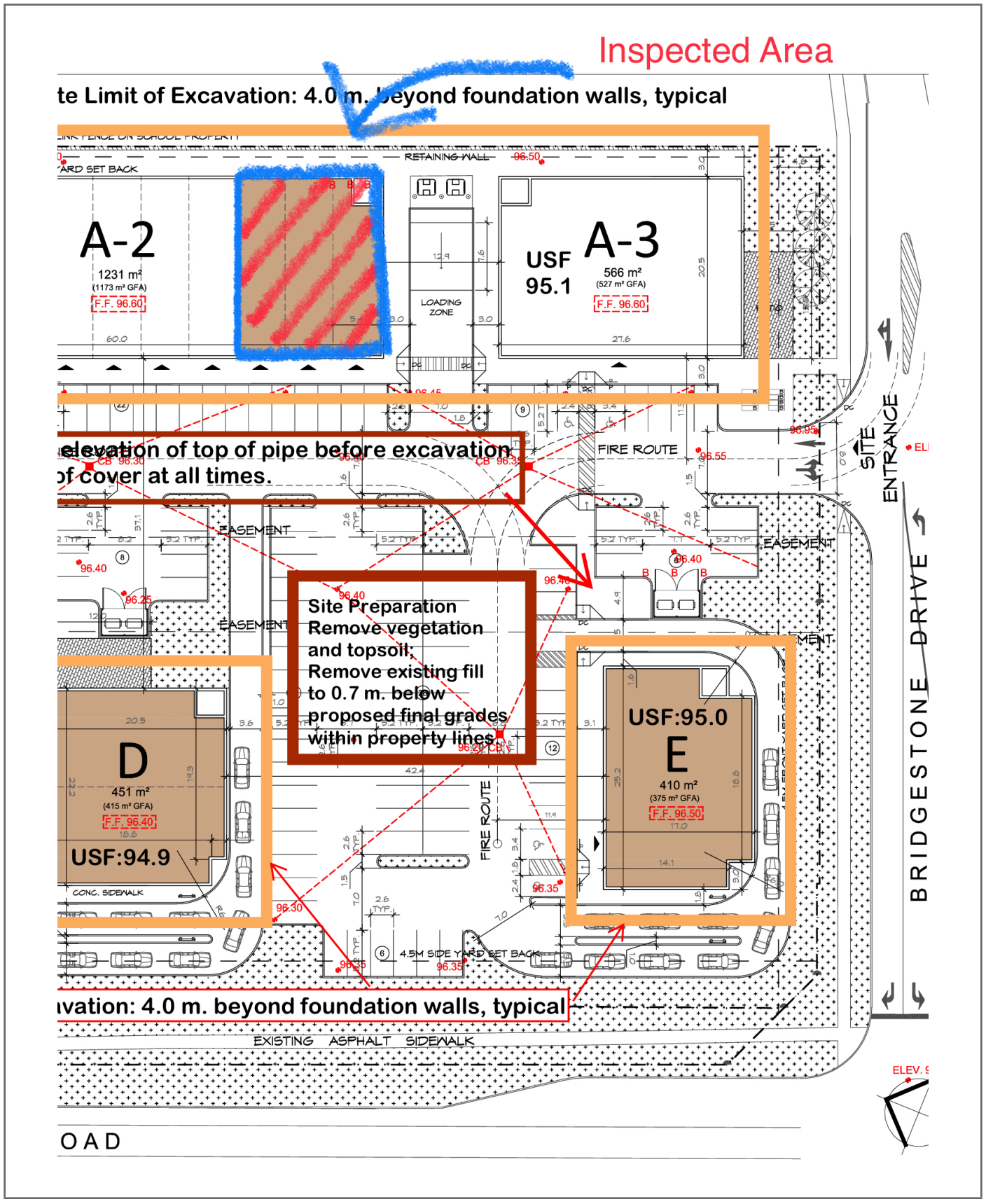
SITE SKETCH



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Site Memorandum

PHOTO1

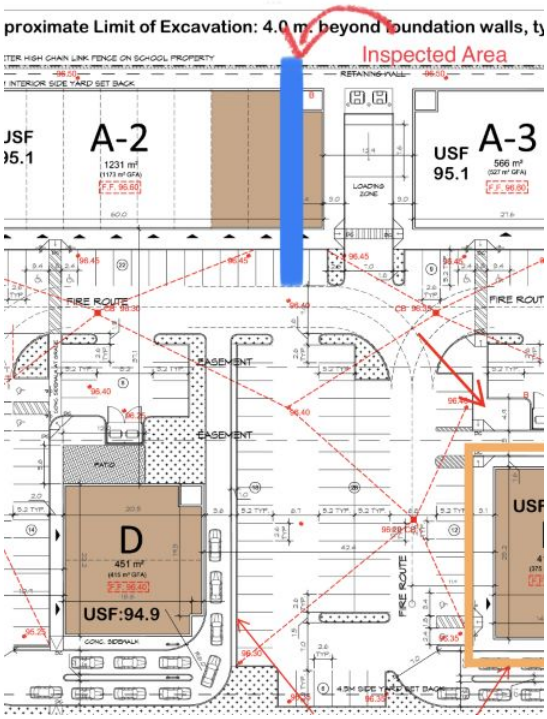

PHOTO2

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PHOTO3

PHOTO4

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Site Memorandum

PHOTO5

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 09.2021 9:04 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-2**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-2

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

A soft spot was observed, contractor was informed, soft spot was excavated and replaced with fresh material.

Conforming

The above noted area is considered in general conformance.

It is Paterson understanding that engineered fill 5/8 will be used to cover all the surface to protect USF from winter weather conditions/frost .

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Site Memorandum

SITE SKETCH

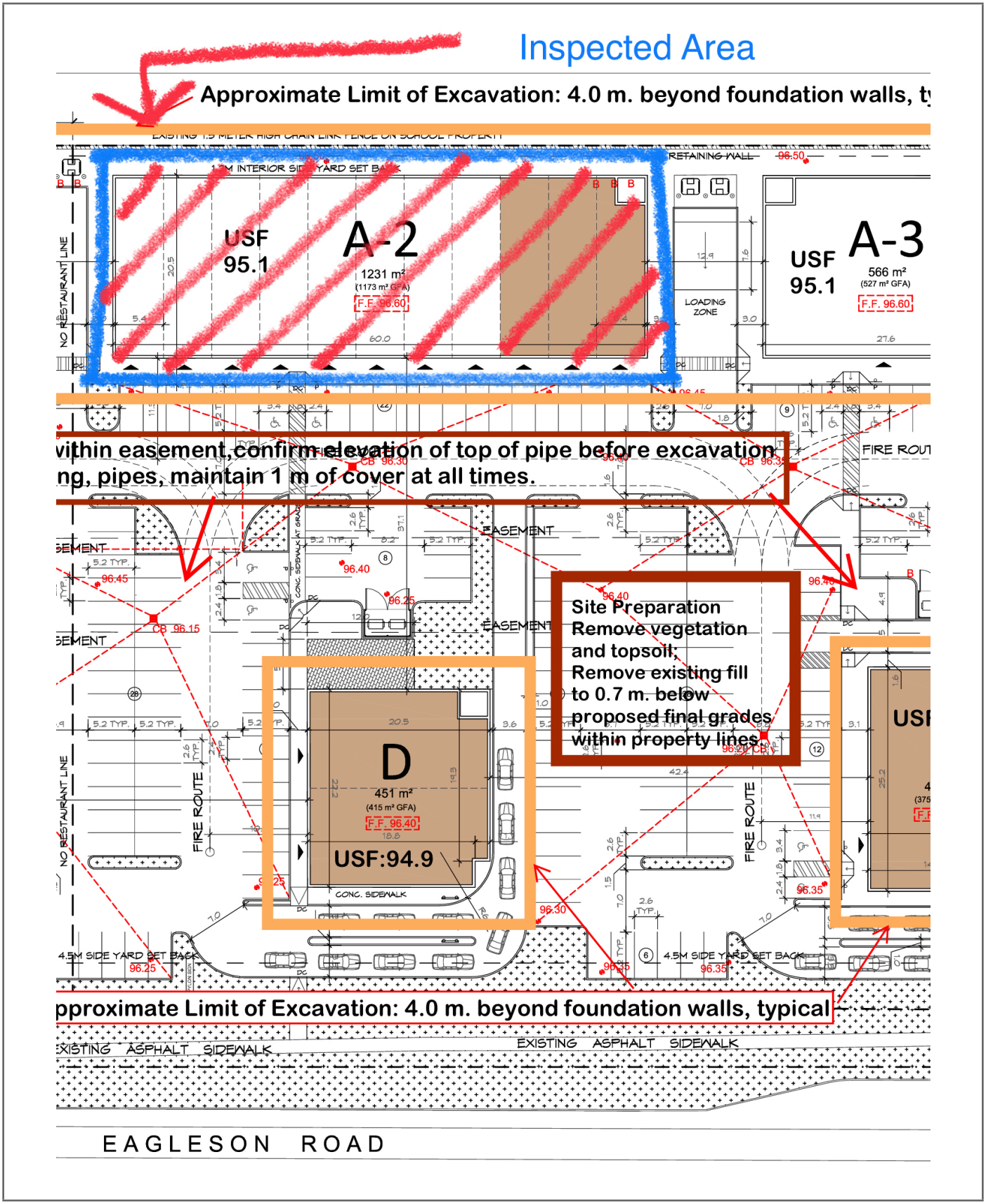

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PHOTO1

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PHOTO3

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 09.2021 3:00 PM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building A-3 (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-3 (See Sketch Attached)

Observations

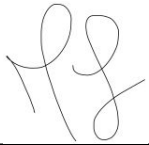
- At the time of the review, the above noted area was excavated to varying depths according to the site contact.
- Contractor was observed removing the heavily saturated silty clay with gravel and boulder material that was agreed upon by client & contractor and replaced with well graded engineered fill.

At the time of inspection the subgrade was +/- 400MM to +/- 900MM below USF, the subgrade consist of Undisturbed native grey silty clay.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.

Two visits have been conducted throughout the day



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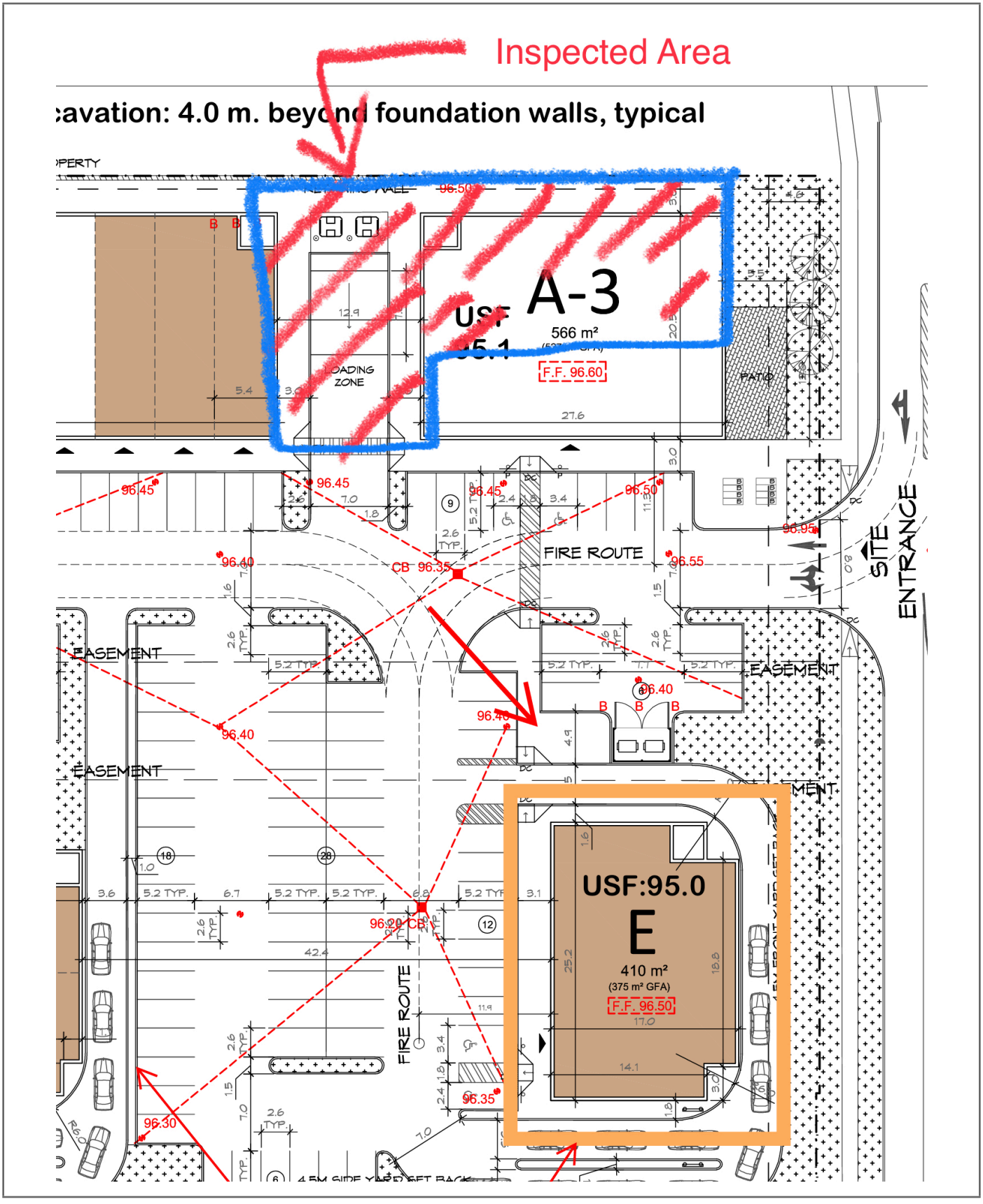

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PHOTO3

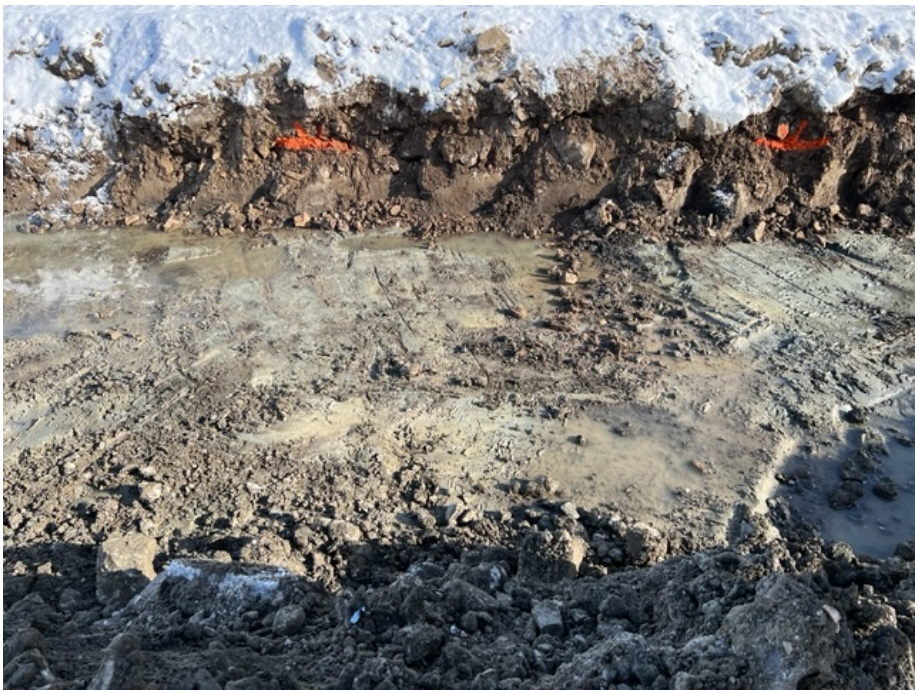

PHOTO4

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 10.2021 11:30 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-1

Proof Roll Review - View Attached Highlighted Sketch For Locations

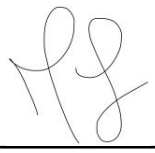
At the time of the review contractor has placed the second lift , it consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

It is Paterson understanding that there will be approximately 0.9m of fill required, therefore the backfill process will will be required in 3 (300mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the final lift and arrange for a proof roll review when ready.



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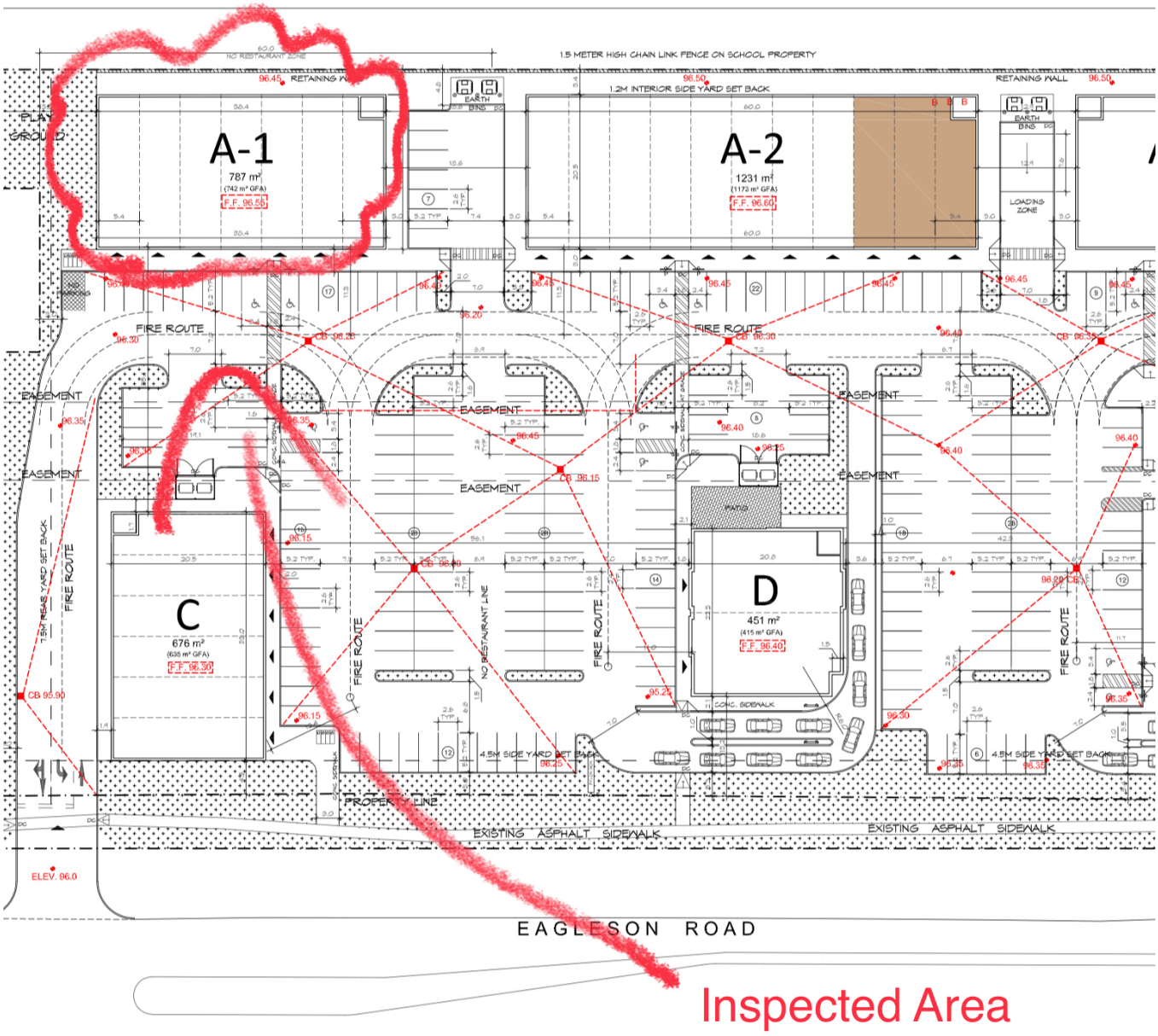
SITE SKETCH



AGLESON - REVISED SITE PLAN

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 10.2021 8:30 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-2**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-2

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

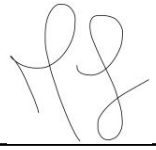
It is Paterson understanding that there will be approximately 0.9m of fill required, therefore the backfill process will will be required in 3 (300mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the second lift and arrange for a proof roll review when ready.

Note: It is recommended to remove the snow prior of backfill.



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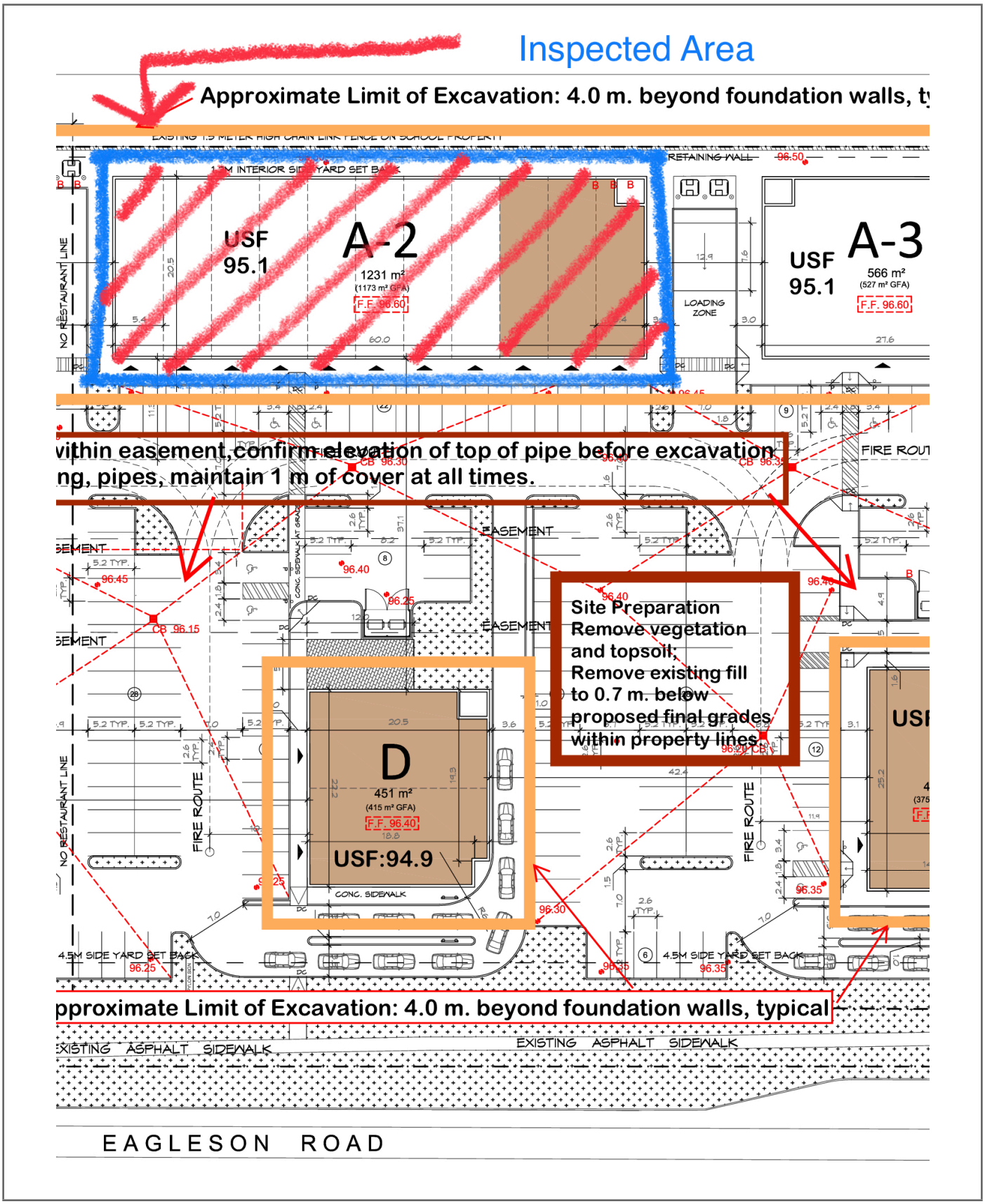

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 10.2021 2:00 PM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-3**
AUTHOR: Cole Caillier
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-3

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

It is Paterson understanding that there will be approximately 0.8m of engineering fill requried to raise the subgrade to proposed USF, therefore the backfill process will be required in (2) two (400mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the second lift and arrange for a proof roll review when ready.

COLE CAILLIER

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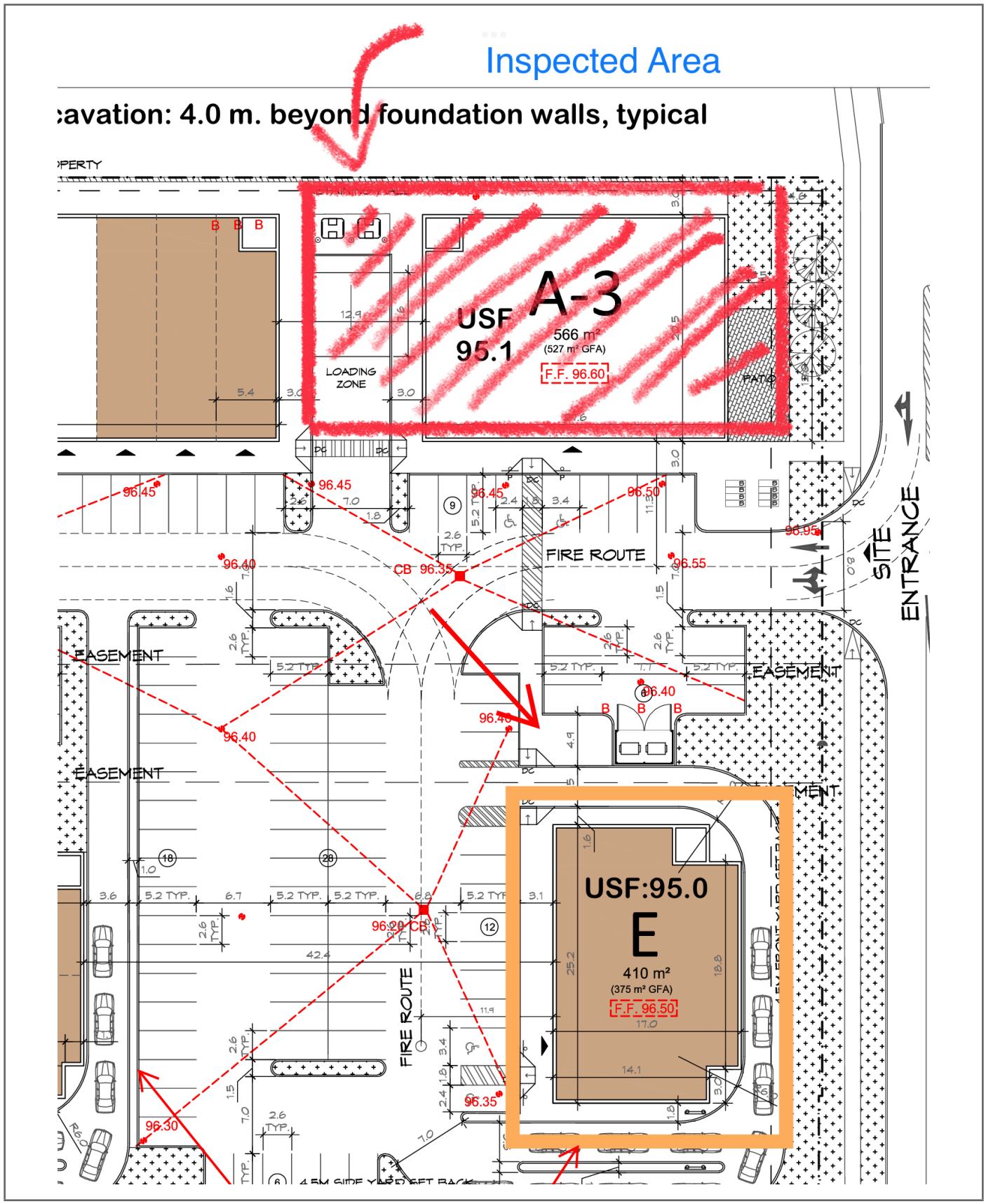

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 13.2021 2:00 PM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-3**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-3

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill mixed with some clay . A proof roll was conducted with a Smooth Drum roller and heavy deflection was observed.

Due to heavy rain in the past couple of days and clay being mixed with the engineering fill , the material is considered non-conforming.

Non - Conforming

The above noted area is considered non-conforming due to heavy flexing of the inspected material.

Recommendations & Remarks

- Removing all saturated material .
- Replace all existing material with well graded blast rock or approved engineered fill.
- It is recommended to remove any vegetation prior to backfilling, contractor should avoid having construction debris in the fill or organic material while backfilling.

Excessive water runoff was encountered, Contractor was pumping the water out, it is recommended to place the new material on a dry surface to avoid having heavily saturated material on the subgrade.

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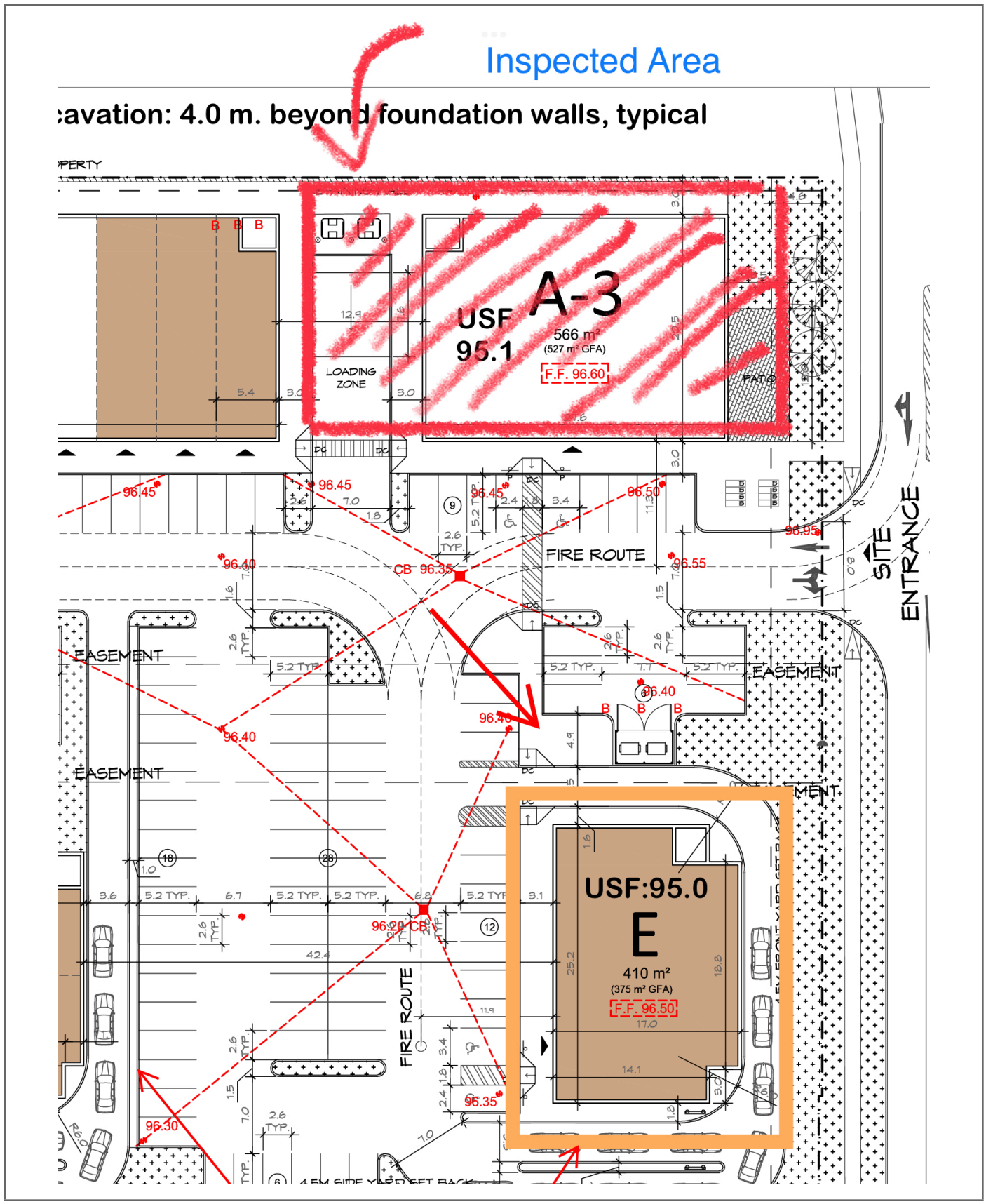

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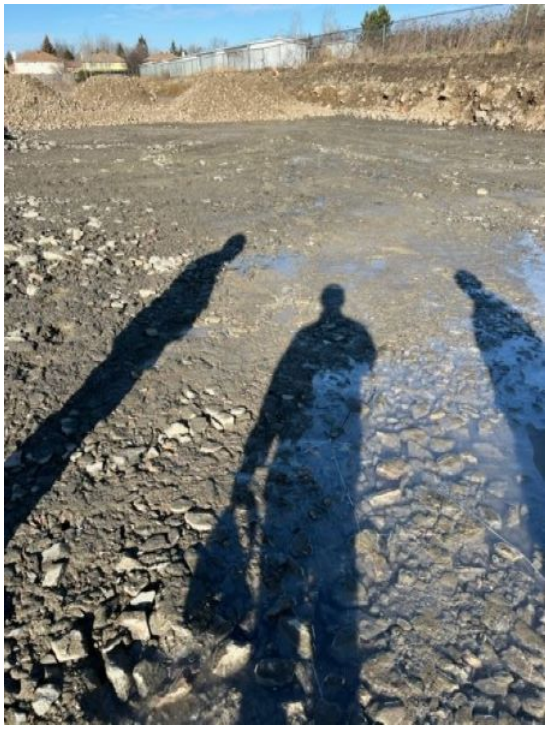

PHOTO2

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 13.2021 9:30 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-1**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

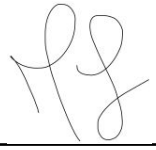
Building Pads : A-1

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review contractor has placed the final lift , it consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

Conforming

The above noted area is considered in general conformance.



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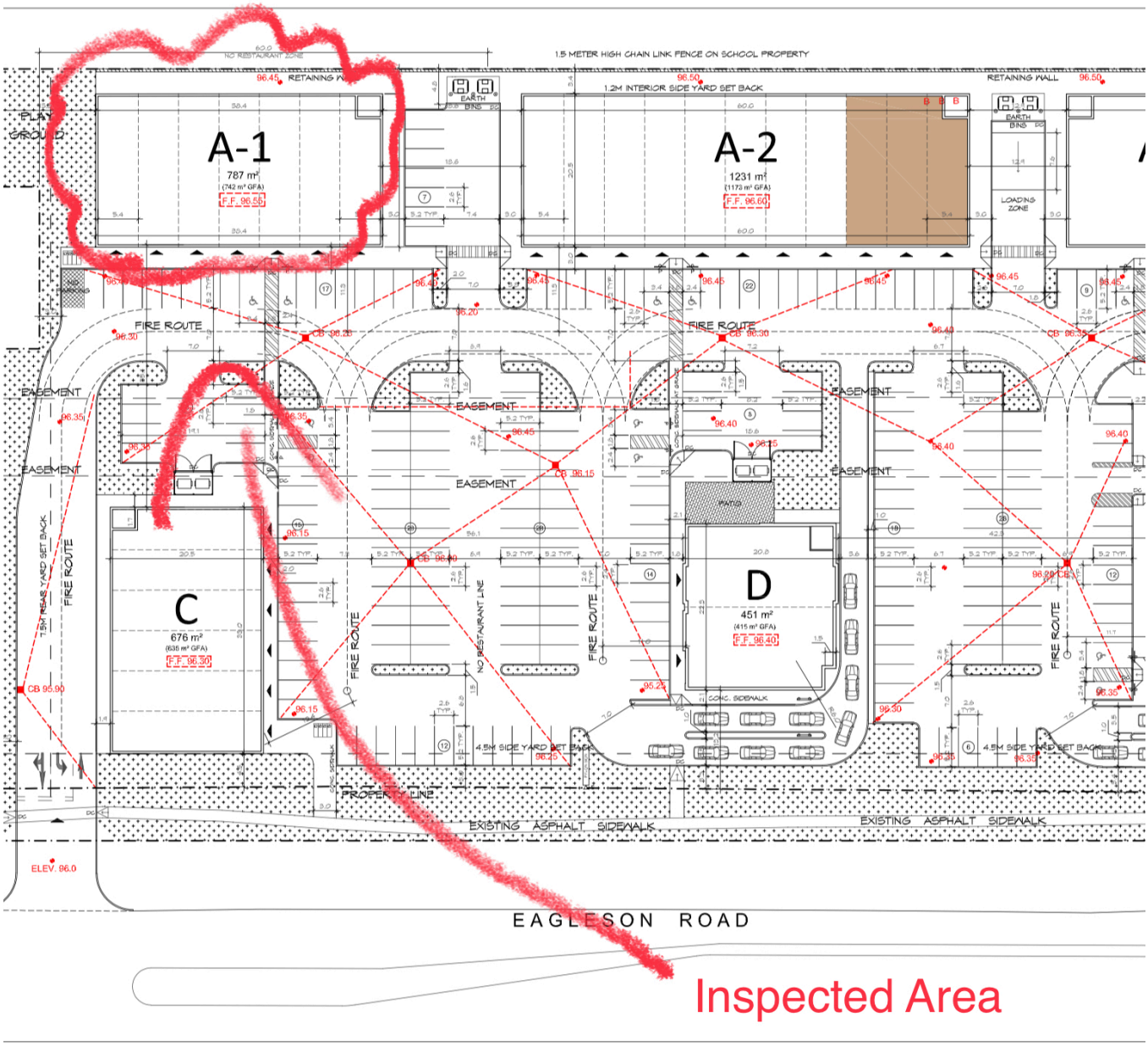

AGLESON - REVISED SITE PLAN

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 13.2021 10:30 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-2**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-2

Proof Roll Review - View Attached Highlighted Sketch For Locations

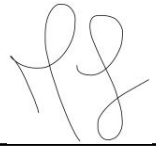
At the time of the review contractor has placed the second lift , it consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

It is Paterson understanding that there will be approximately 0.9m of fill required, therefore the backfill process will will be required in 3 (300mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the final lift and arrange for a proof roll review when ready.



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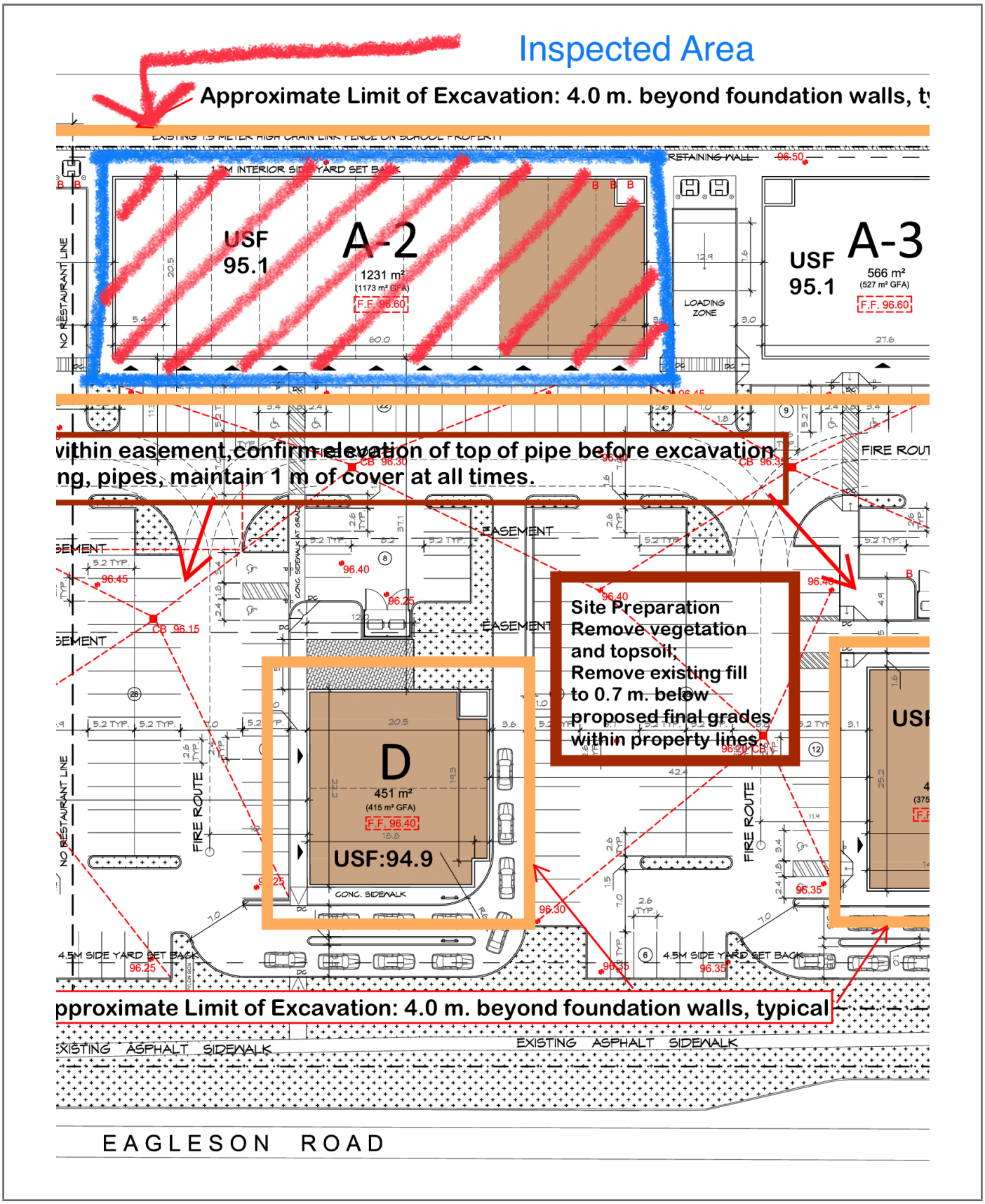

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 13.2021 2:00 PM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building C (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building C (See Sketch Attached)

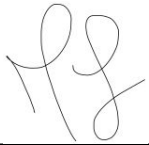
Observations

- At the time of the review, the above noted area was excavated to varying depths according to the site contact.

- The subgrade was +/- 400 MM below USF, the subgrade consist of Undisturbed native grey silty clay.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.



MAHMOUD ISKANDAR

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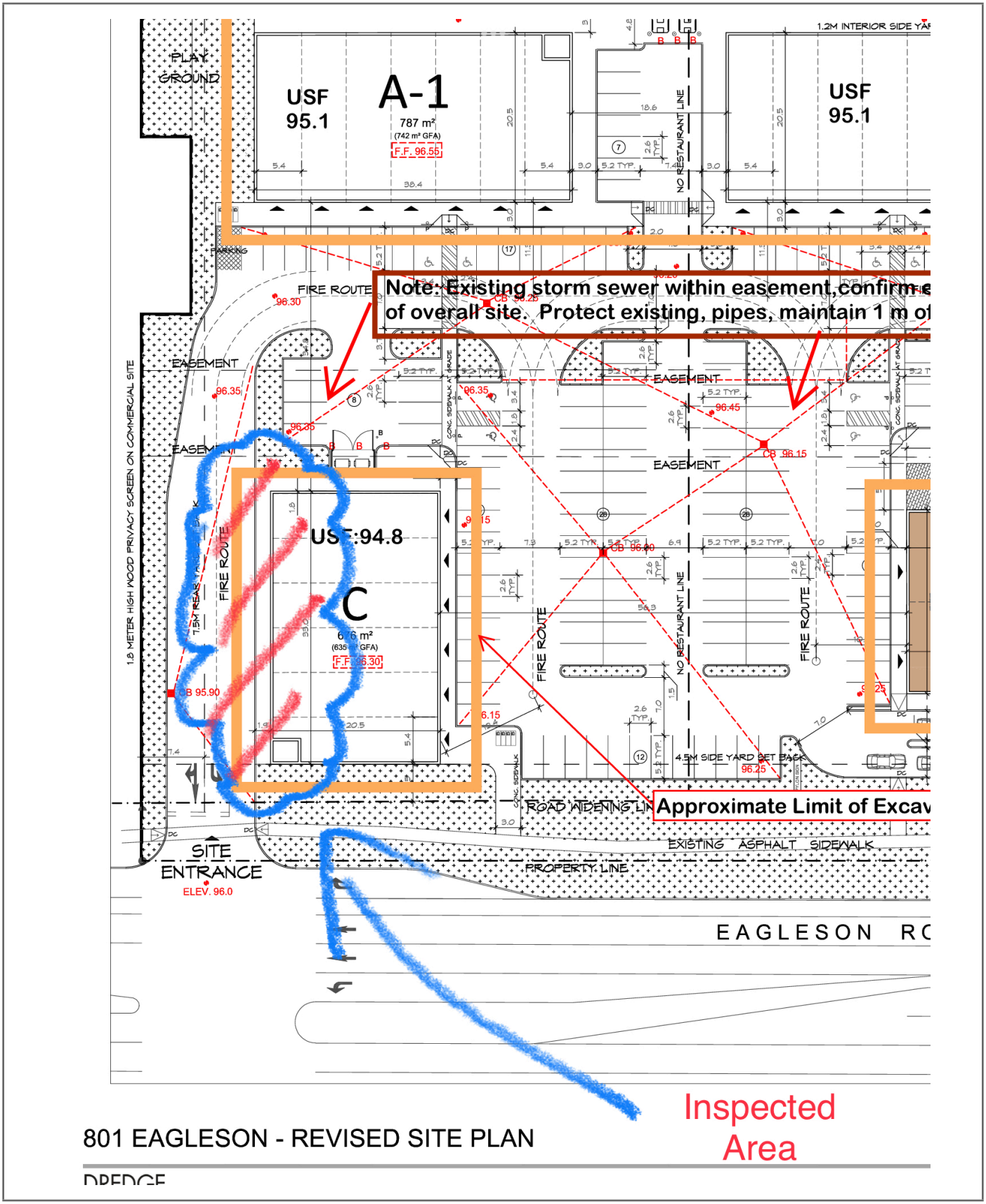

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Site Memorandum

PHOTO1

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Site Memorandum

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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 14.2021 10:30 AM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-2**
AUTHOR: Mahmoud Iskandar
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

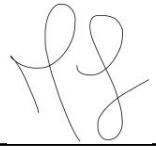
Building Pads : A-2

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review contractor has placed the final lift , it consisted of well graded engineered fill 5/8 . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

Conforming

The above noted area is considered in general conformance.



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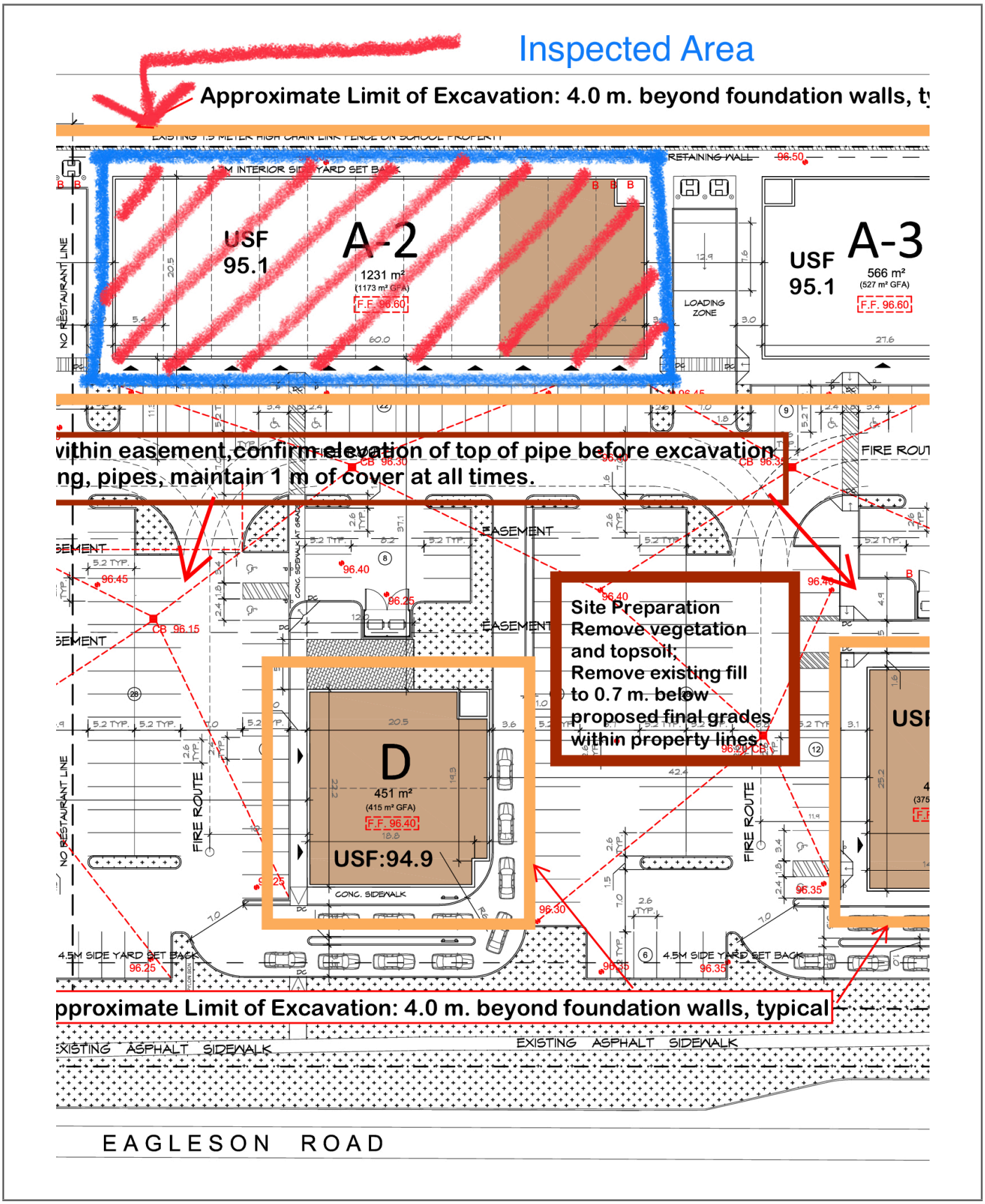

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 14.2021 12:00 PM FILE: PM13772

PROJECT: Bridgestone at Eagleson Plaza - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review - Building A-3 (See sketch Attached)**

AUTHOR: Mahmoud Iskandar CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) carried out a site inspection today at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Subgrade Review - Building A-3 (See Sketch Attached)

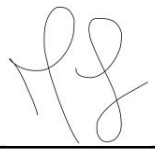
Observations

- At the time of the review, the above noted area was excavated to varying depths according to the site contact.
- Contractor was observed removing the heavily saturated silty clay with gravel and boulder / engineered fill mixed with clay material that was agreed upon by client & contractor and replaced with well graded engineered fill.

At the time of inspection the subgrade was +/- 400MM to +/- 900MM below USF, the subgrade consist of Undisturbed native grey silty clay.

Recommendations

- Engineered fill such as (OPSS Granular B type 2 or GA) can be placed up to lifts of 300mm and is to be compacted with a large vibratory smooth drummed ride on roller. The engineered fill should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support and be compacted to at least 98% of the SPMDD.
- Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill.
- Arrange for a proof roll inspection when ready. Arrange for density testing on the final lift of engineered fill upon approval of the placement of blasted rock.
- It is recommended to pump all the water collected on the Subgrade prior of placing fill material.



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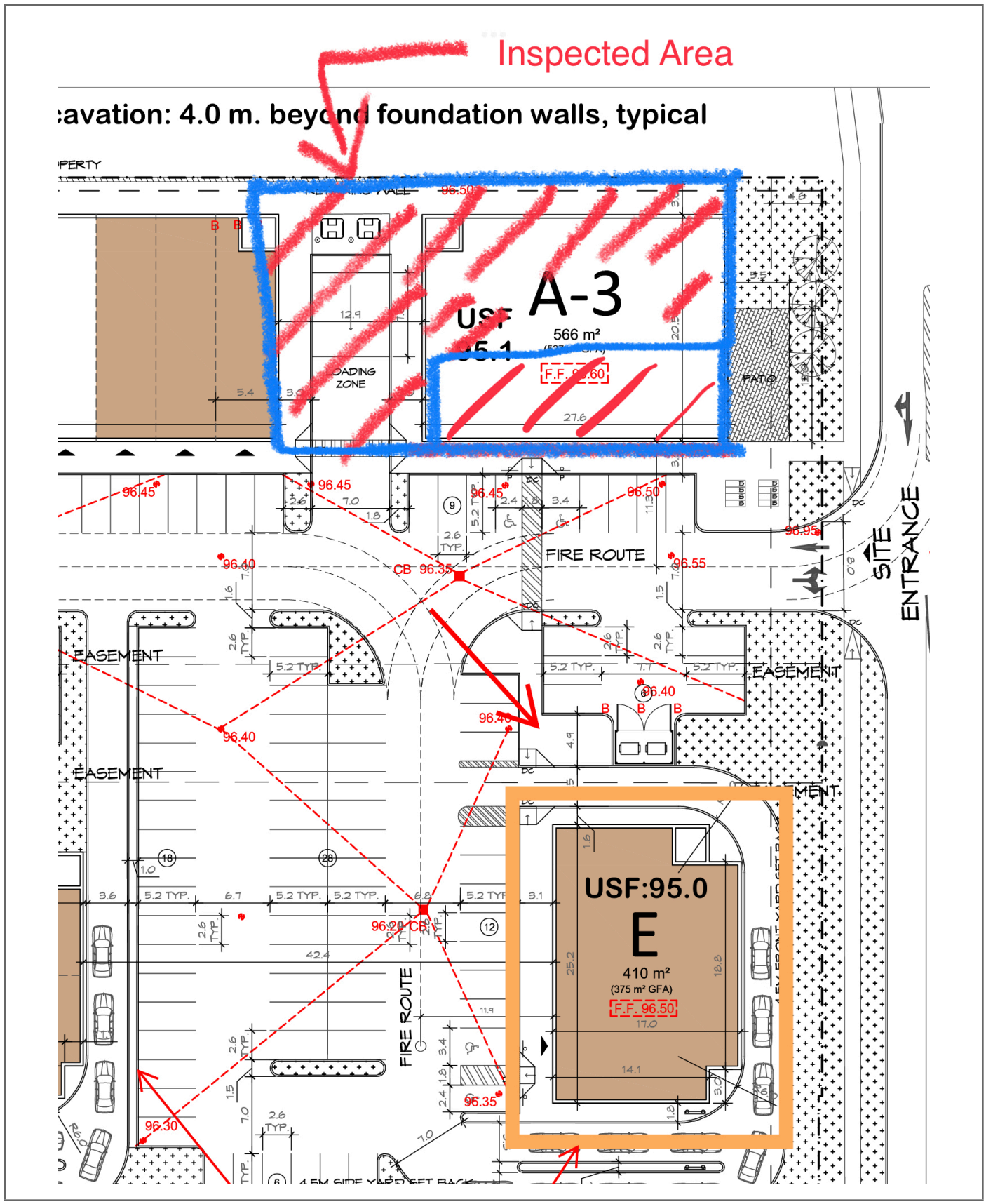

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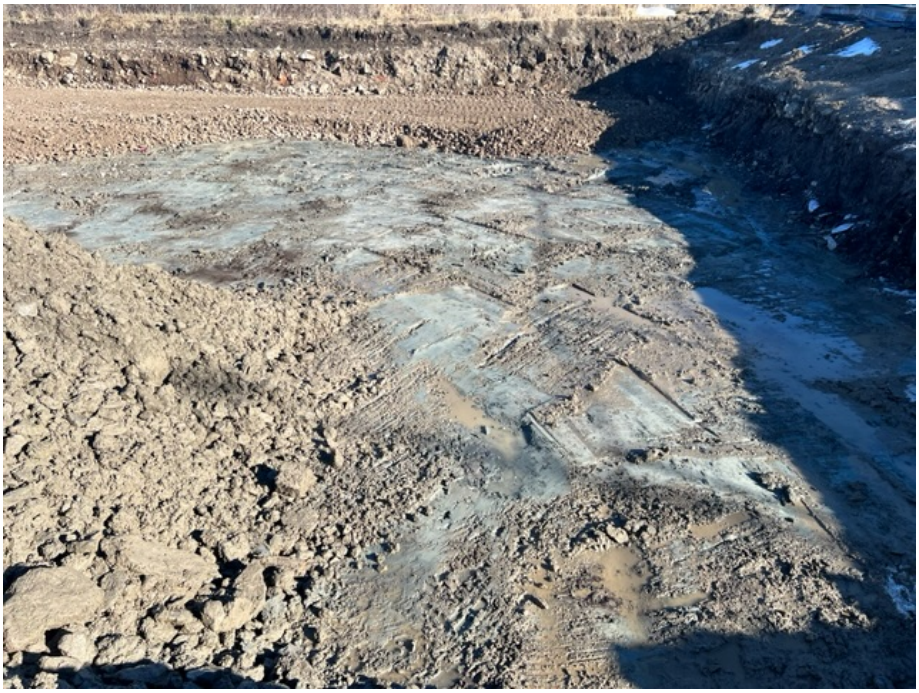
PHOTO1



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Site Memorandum

TO: Urbandale Corporation
DATE: Dec 14.2021 2:00 PM
FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Proof Roll Review : Building A-3**
AUTHOR: Cole Caillier
CONTRACTOR: Tomlinson

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

As requested, Paterson Group (Paterson) conducted a Proof Roll Review at the aforementioned location.

Building Pads : A-3

Proof Roll Review - View Attached Highlighted Sketch For Locations

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

It is Paterson understanding that there will be approximately 0.8m of engineering fill requried to raise the subgrade to proposed USF, therefore the backfill process will be required in (2) two (400mm) lifts , each lift should be inspected and approved prior of placing the second lift .

Conforming

The above noted area is considered in general conformance.

Proceed to the second lift and arrange for a proof roll review when ready.

COLE CAILLIER

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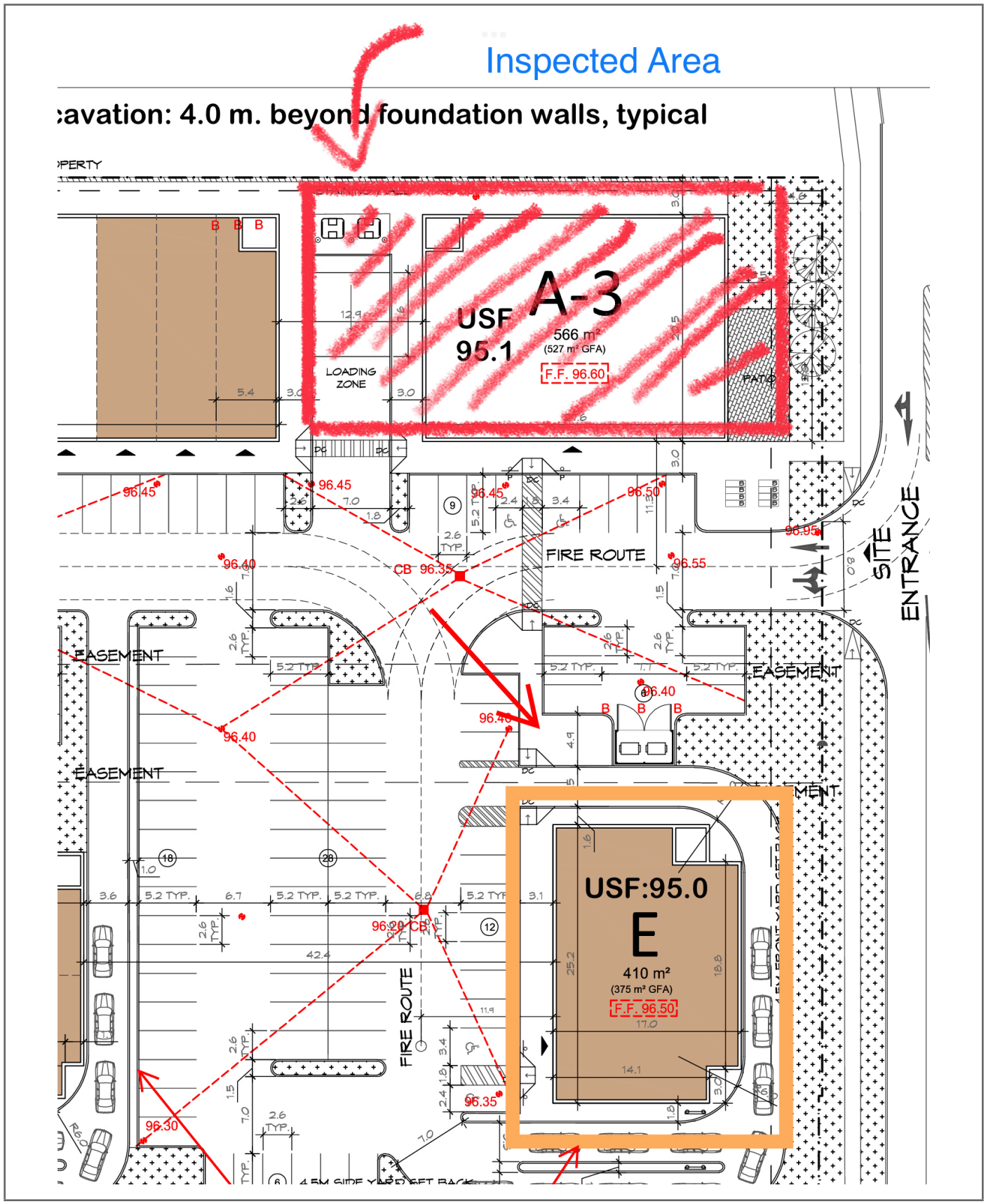

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 15.2021 1:30 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

The current elevations are as follows (information provided by Tomlinson):

94.5m (0.3m +/- below USF)

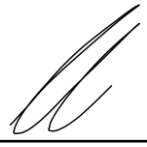
Conforming

The above noted area is considered in general conformance.

It is recommended to pump out the water observed on the edges of the pad, prior to placement of the next left.

Proceed to the second lift and arrange for a proof roll review when ready.

Note two visits were done one at 9:00am & 2:00pm



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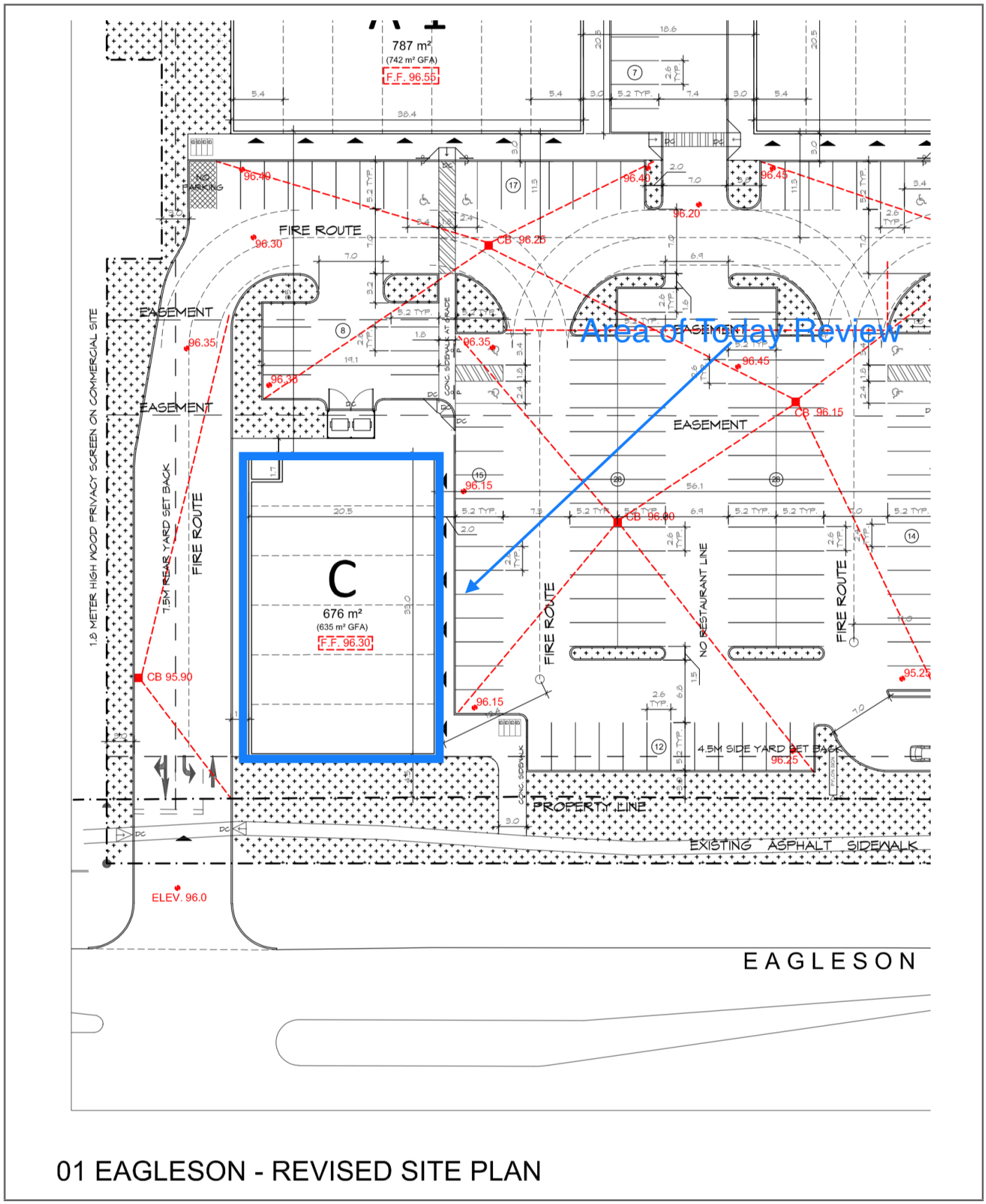

01 EAGLESON - REVISED SITE PLAN

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 16.2021 2:00 PM FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review Building D (See Sketch Attached)**
AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Geotechnical Review

Subgrade Review Building D (See Sketch Attached)

The subgrade consists of a dense native brown/ grey silty clay is considered acceptable from a geotechnical perspective for the placement of engineered fill.

Place up to a maximum of 300mm lifts of crushed engineered fill (Granular B Type 1 or 2) and consolidate with suitable equipment to 98% SPMDD. The engineered fill for the building pad should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support.

The subgrade elevations are as follows (information provided by Tomlinson):

94.5m (0.4m below USF)

Recommendations

Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill ensure all water is pumped out prior to placement of the engineered fill.

Have us perform field density testing on the compacted engineered fill when ready.

Protect the soil from freezing conditions
Note: Two visits were done at 9:00am & 2:00pm

COLE CAILLIER

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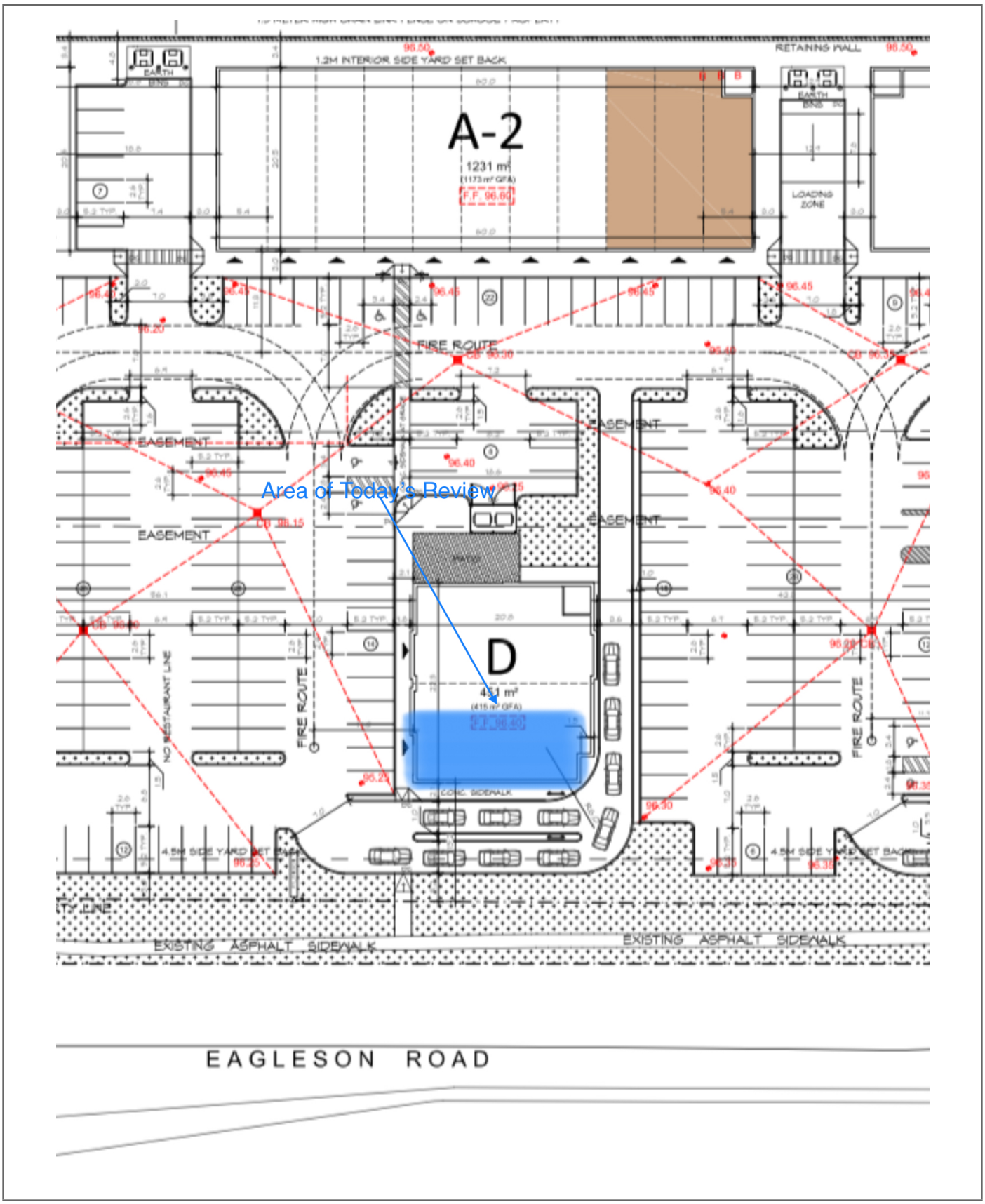

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 17.2021 2:00 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review Building D (See Sketch Attached)**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Geotechnical Review

Subgrade Review Building D (See Sketch Attached)

The subgrade consists of a dense native brown/ grey silty clay is considered acceptable from a geotechnical perspective for the placement of engineered fill.

Place up to a maximum of 300mm lifts of crushed engineered fill (Granular B Type 1 or 2) and consolidate with suitable equipment to 98% SPMDD. The engineered fill for the building pad should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support.

The subgrade elevations are as follows (information provided by Tomlinson):

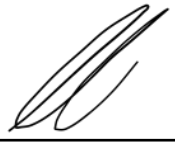
94.5m (0.4m below USF)

Recommendations

Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill ensure all water is pumped out prior to placement of the engineered fill.

Have us perform field density testing on the compacted engineered fill when ready.

Protect the soil from freezing conditions
Note: Two visits were done at 9:00am & 2:00pm



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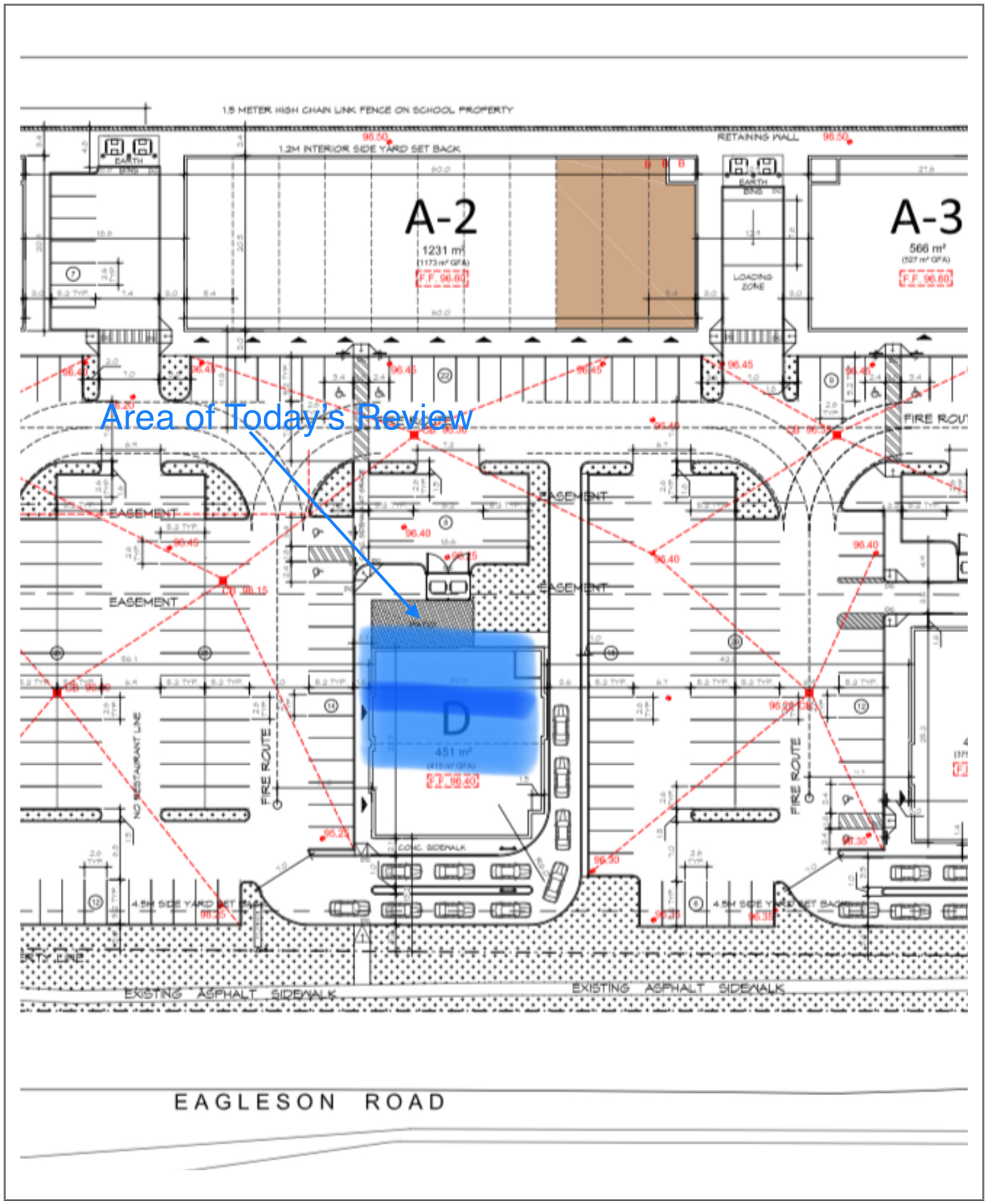

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 20.2021 2:00 PM FILE: PM13772
PROJECT: 801 Eagleson - Site Excavation
ADDRESS: 801 Eagleson Road , Kanata
LOCATION: **Subgrade Review Building E (See Sketch Attached)**
AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Geotechnical Review

Subgrade Review Building E (See Sketch Attached)

The subgrade consists of a dense native brown/ grey silty clay is considered acceptable from a geotechnical perspective for the placement of engineered fill. Topsoil was observed at USF native silty clay was observed 1.15m below USF, it is recommended to remove all the top soil material down to silty clay.

Place up to a maximum of 300mm lifts of crushed engineered fill (Granular B Type 1 or 2) and consolidate with suitable equipment to 98% SPMDD. The engineered fill for the building pad should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support.

The subgrade elevations are as follows (information provided by Tomlinson):

93.85m (1.15m below USF)

Recommendations

Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill ensure all water is pumped out prior to placement of the engineered fill.

Have us perform field density testing on the compacted engineered fill when ready.

Protect the soil from freezing conditions

COLE CAILLIER

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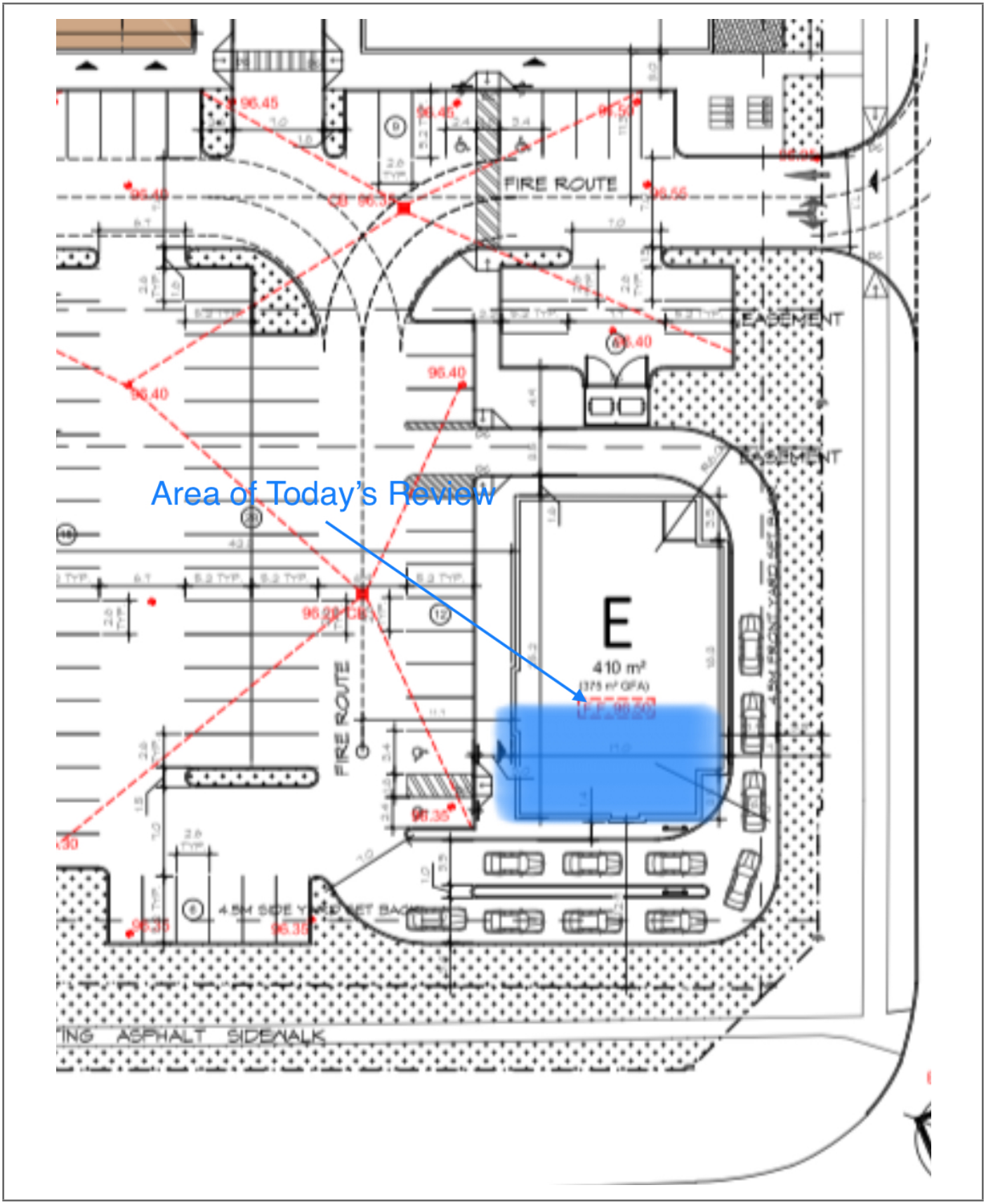

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 20.2021 2:20 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

The current elevations are as follows (information provided by Tomlinson):

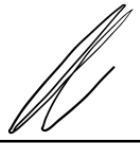
94.9m (USF)

Conforming

The above noted area is considered in general conformance.

It is recommended to pump out the water observed on the edges of the pad, prior to placement of the next left.

Proceed to the second lift and arrange for a proof roll review when ready.



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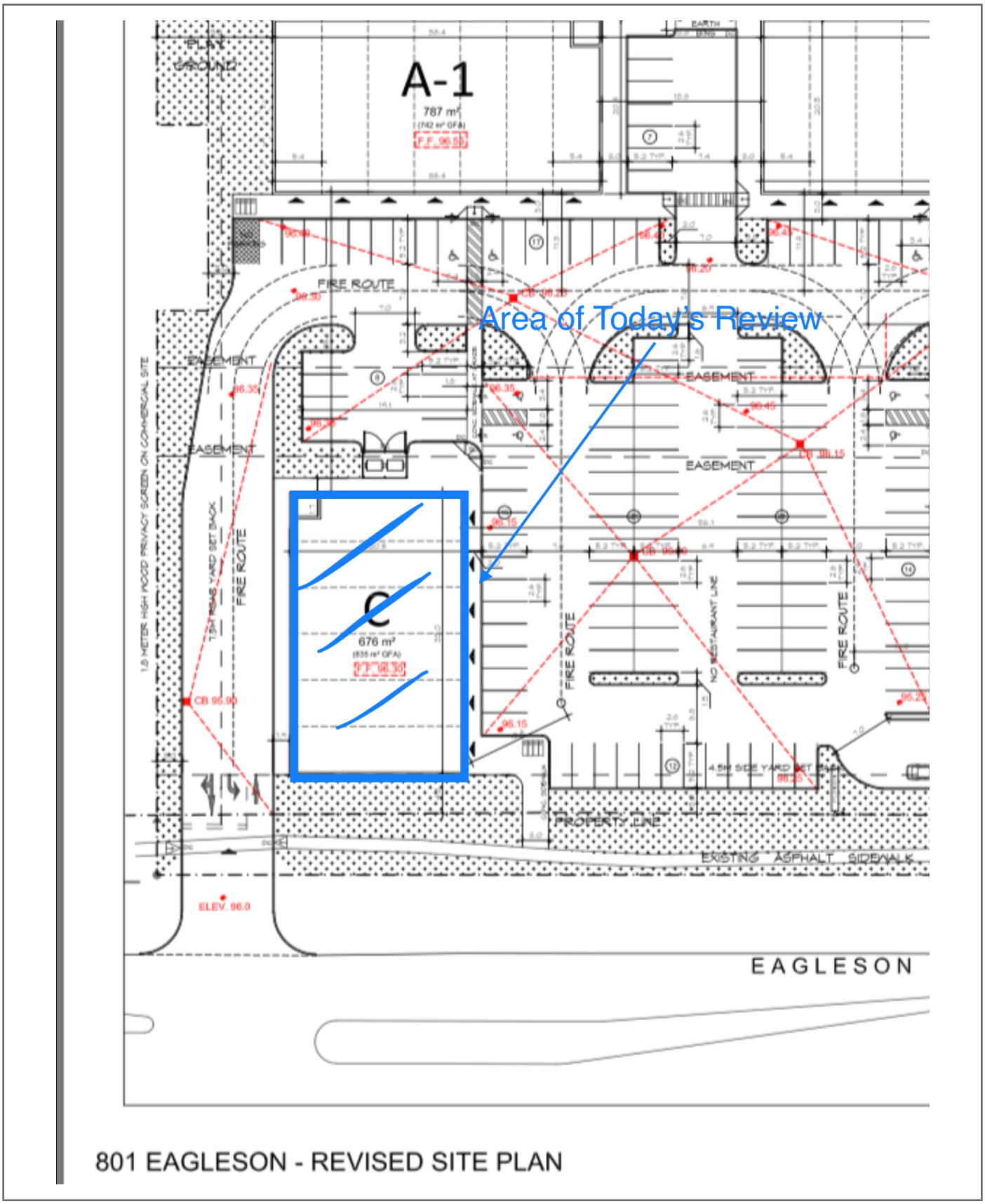

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 21.2021 2:00 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Subgrade Review Building E (See Sketch Attached)**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Reference

This report should be read in conjunction with our Geotechnical Report.

Geotechnical Review

Subgrade Review Building E (See Sketch Attached)

The subgrade consists of a dense native brown/ grey silty clay is considered acceptable from a geotechnical perspective for the placement of engineered fill. Topsoil was observed at USF native silty clay was observed 1.15m below USF, it is recommended to remove all the top soil material down to silty clay.

Place up to a maximum of 300mm lifts of crushed engineered fill (Granular B Type 1 or 2) and consolidate with suitable equipment to 98% SPMDD. The engineered fill for the building pad should be placed in a manner that will provide a minimum ratio of 1H:1V for lateral support.

The subgrade elevations are as follows (information provided by Tomlinson):

93.85m (1.15m below USF)

Recommendations

Continue to protect all exposed subgrade surfaces from water and disturbances prior to placing engineered fill ensure all water is pumped out prior to placement of the engineered fill.

Have us perform field density testing on the compacted engineered fill when ready.

Protect the soil from freezing conditions

COLE CAILLIER

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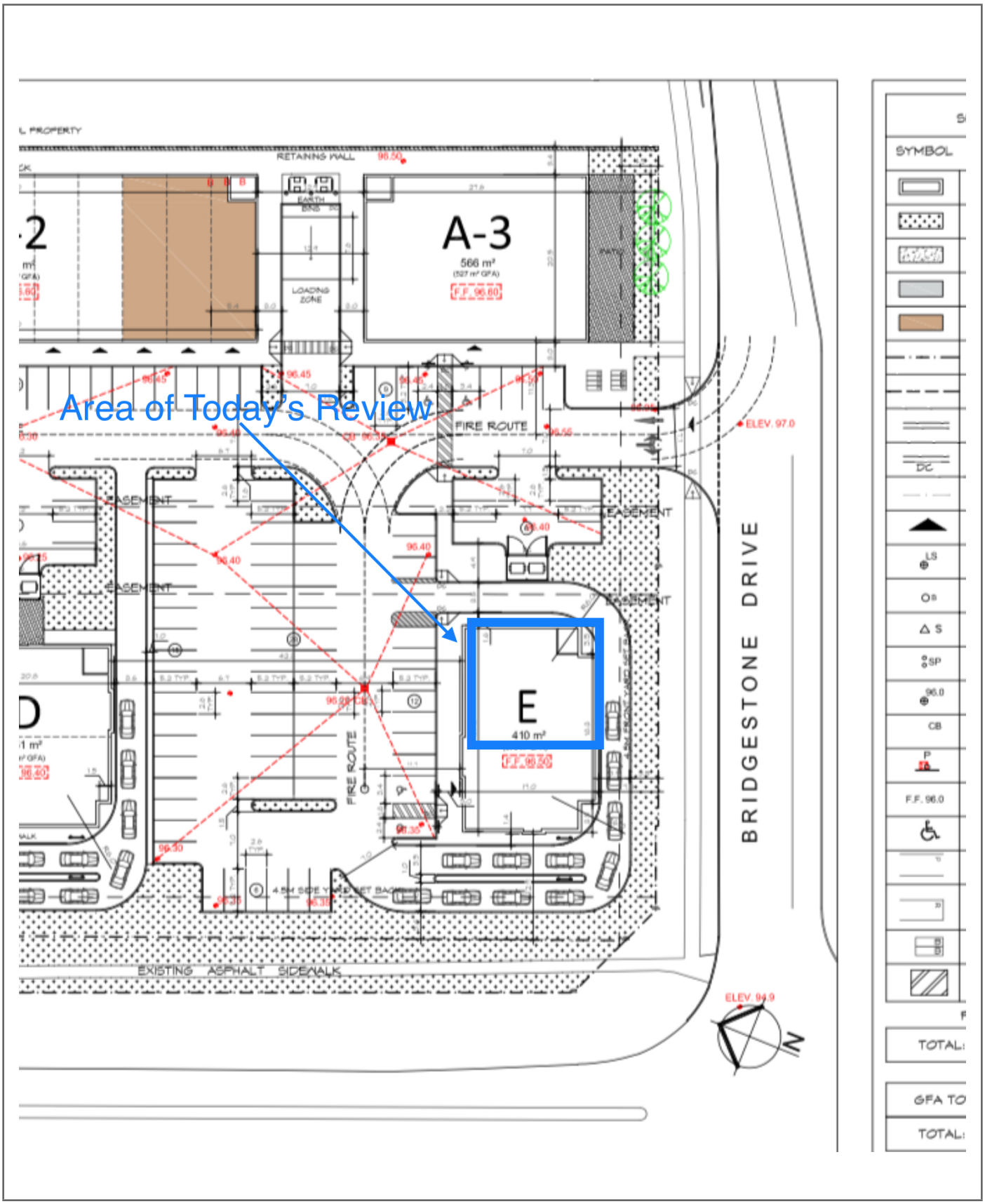

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 21.2021 9:20 AM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads A-3 - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pads A-3 - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

The current elevations are as follows (information provided by Tomlinson):

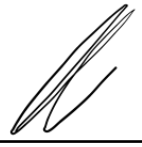
95.3m

Conforming

The above noted area is considered in general conformance.

It is recommended to pump out the water observed on the edges of the pad, prior to placement of the next left.

Proceed to the next lift and arrange for a proof roll review when ready.



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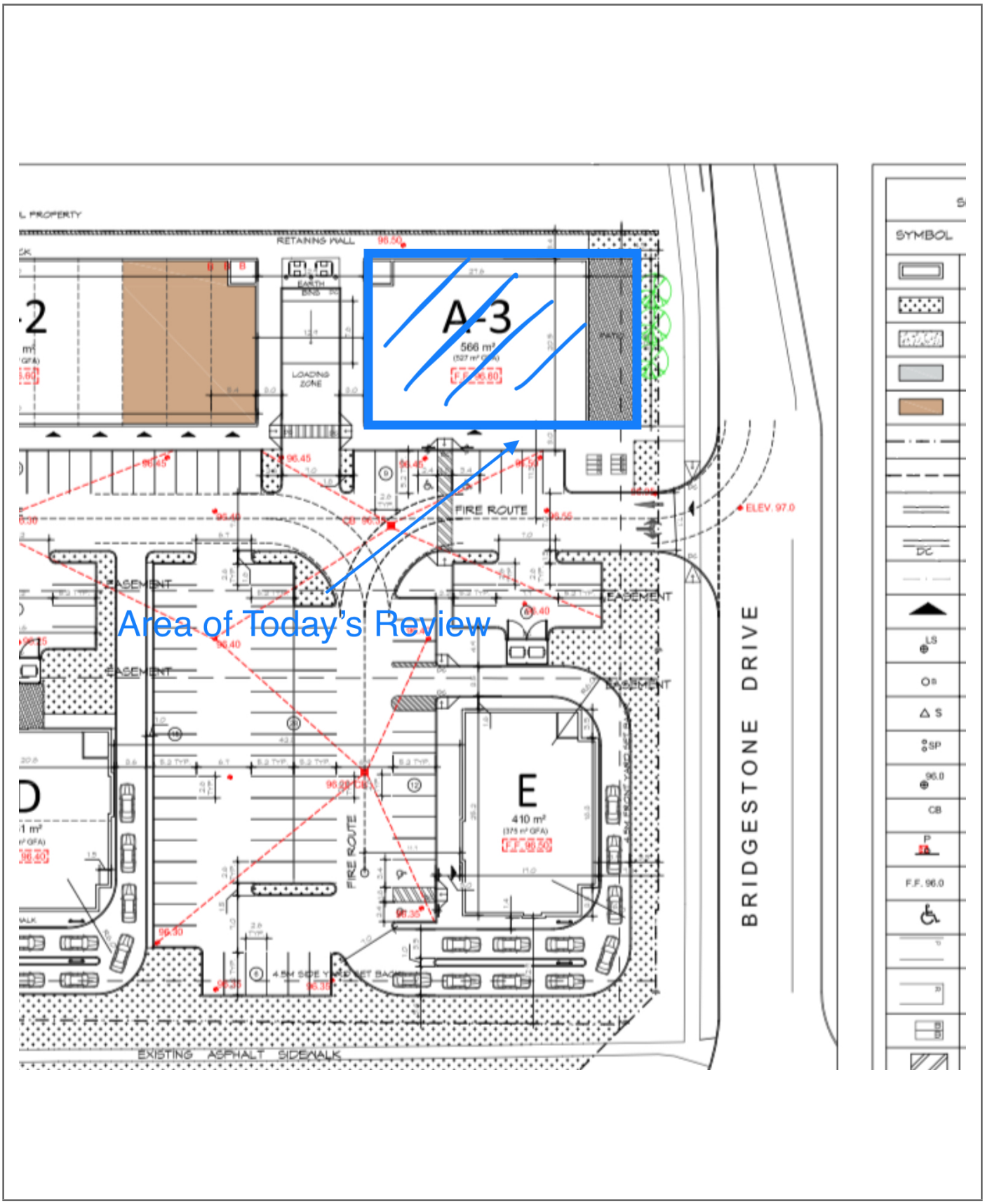

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 22.2021 7:00 AM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads A-3 - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pads A-3 - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

The current elevations are as follows (information provided by Tomlinson):

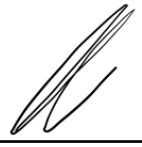
95.7m

Conforming

The above noted area is considered in general conformance.

It is recommended to pump out the water observed on the edges of the pad, prior to placement of the next left.

Proceed to the next lift and arrange for a proof roll review when ready.



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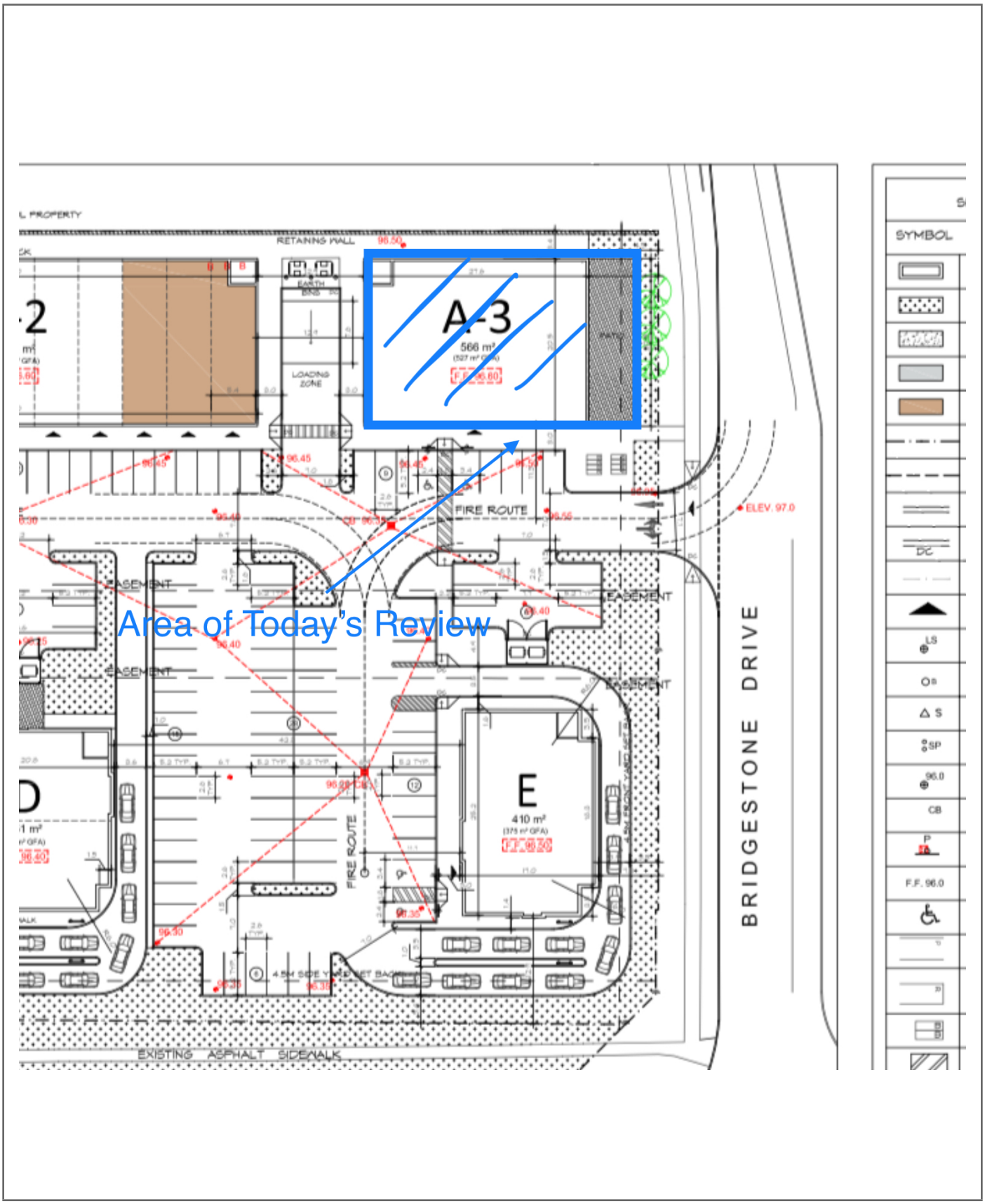

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 22.2021 2:00 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pads C - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

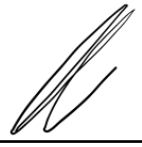
The current elevations are as follows (information provided by Tomlinson):

95.3m

Conforming

The above noted area is considered in general conformance.

Proceed to the next lift and arrange for a proof roll review when ready.



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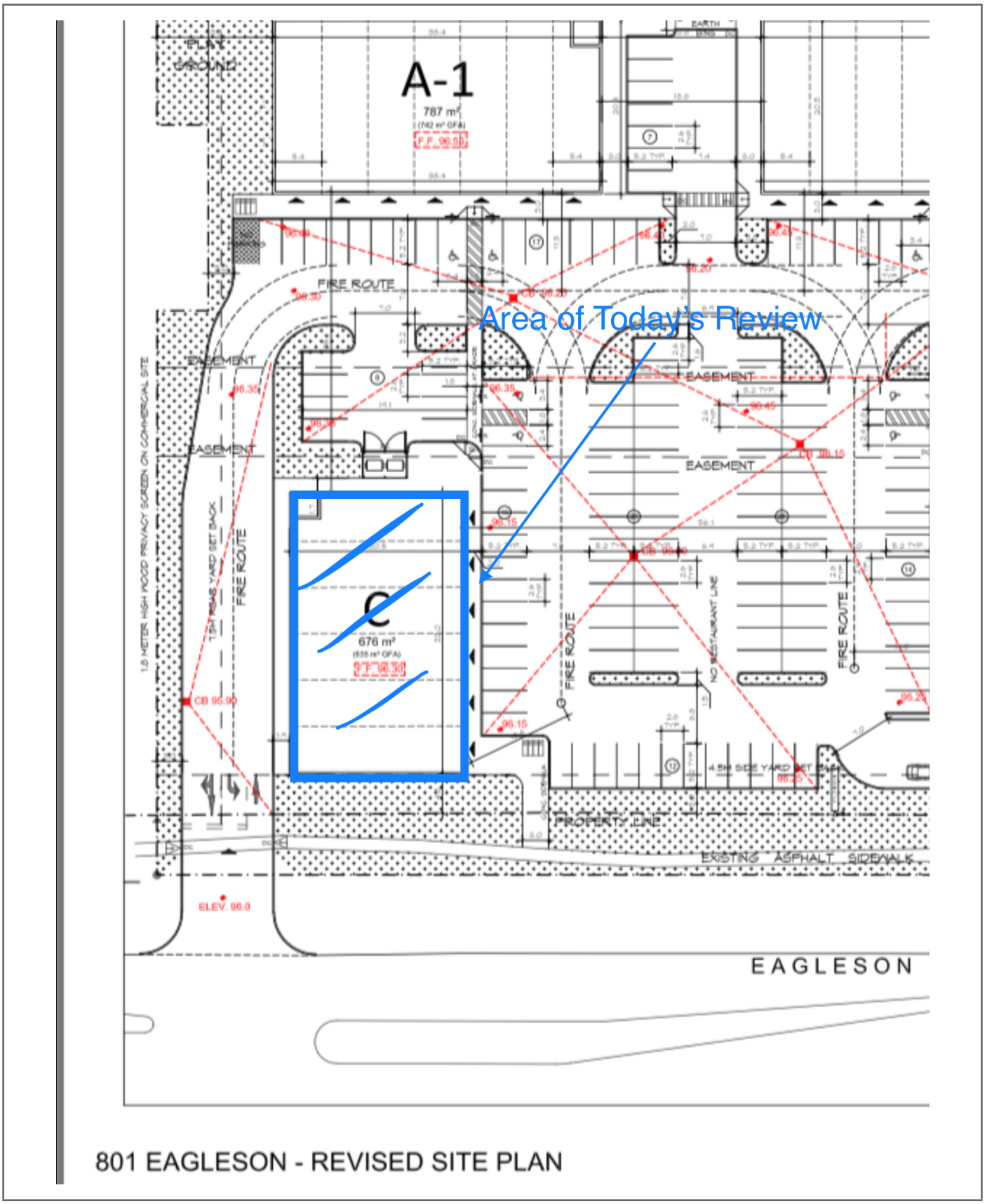

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 22.2021 3:00 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads D - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pad D - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

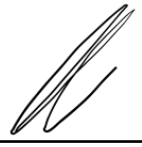
The current elevations are as follows (information provided by Tomlinson):

95.00m

Conforming

The above noted area is considered in general conformance.

Proceed to the next lift and arrange for a proof roll review when ready.



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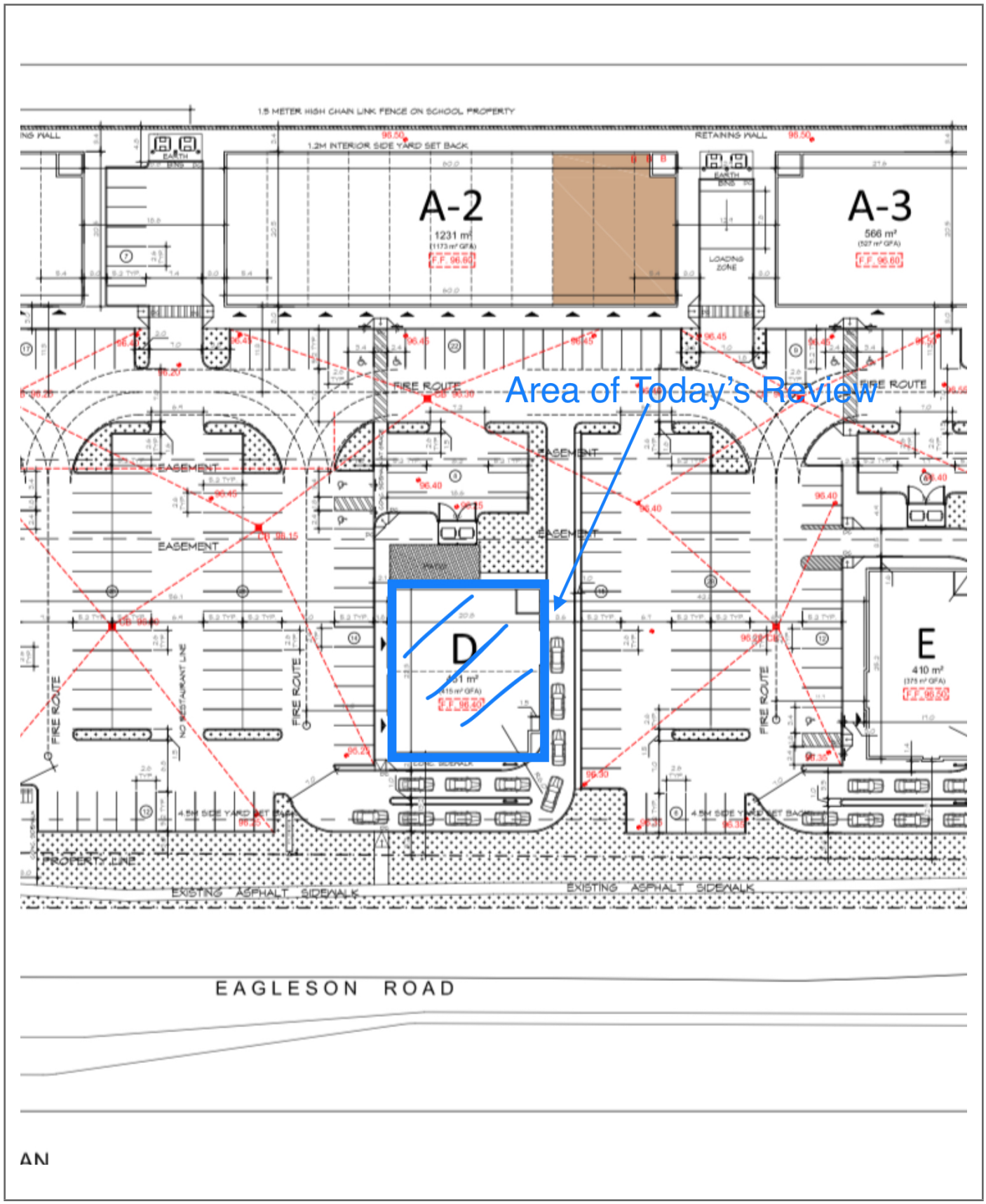

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 22.2021 4:30 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pad E - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pad E - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

Multiple soft spots were observed with the building pad, these area were sub excavated, water pump out that was on trapped between the subgrade and crushed stone. The area was repacked ones all the water had been removed.

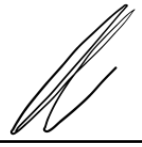
The current elevations are as follows (information provided by Tomlinson):

94.4m

Conforming

The above noted area is considered in general conformance.

Proceed to the next lift and arrange for a proof roll review when ready.



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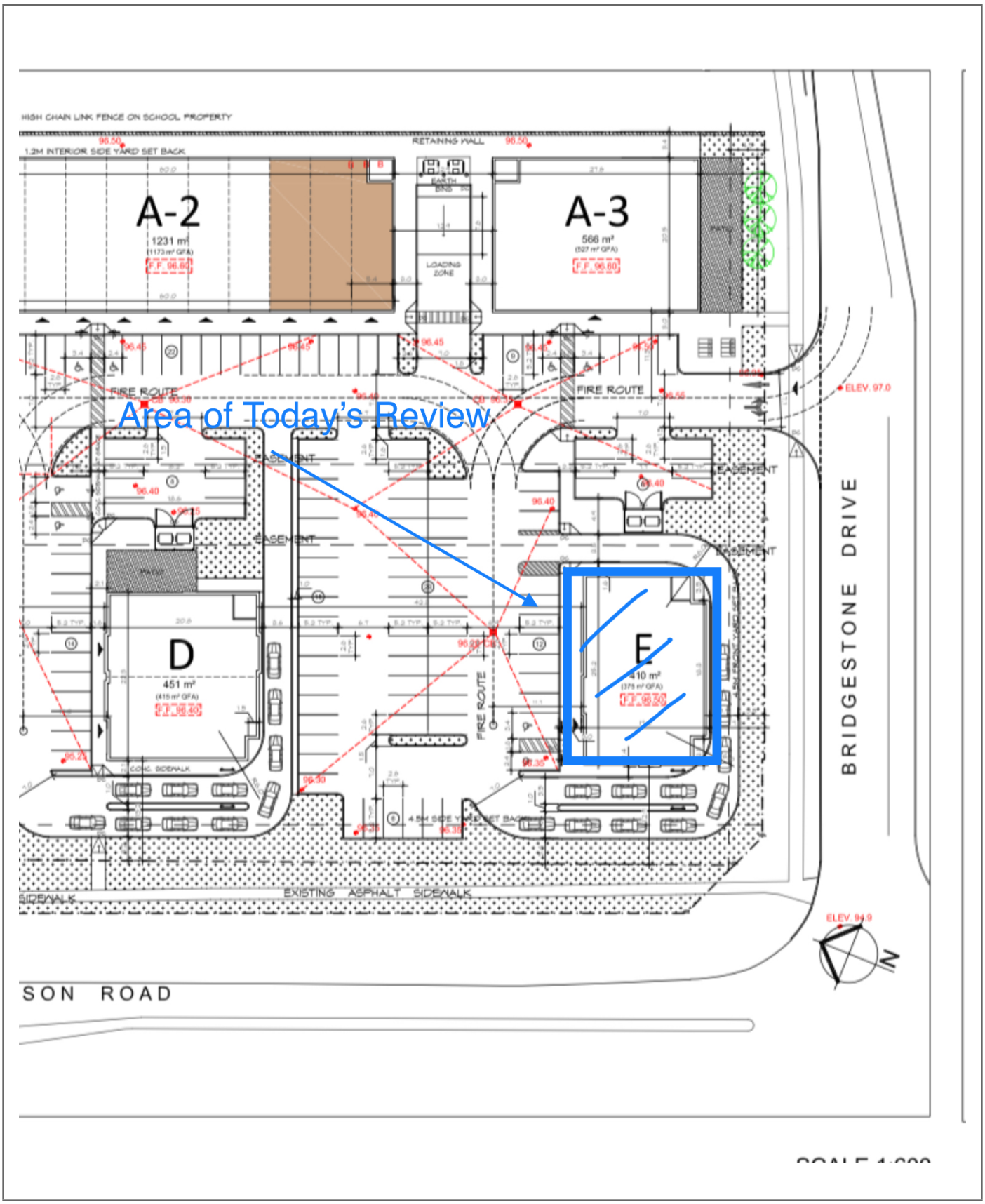

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 23.2021 3:00 PM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads D - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pad D - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

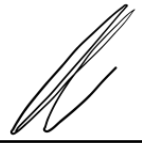
The current elevations are as follows (information provided by Tomlinson):

95.30m

Conforming

The above noted area is considered in general conformance.

Proceed to the next lift and arrange for a proof roll review when ready.



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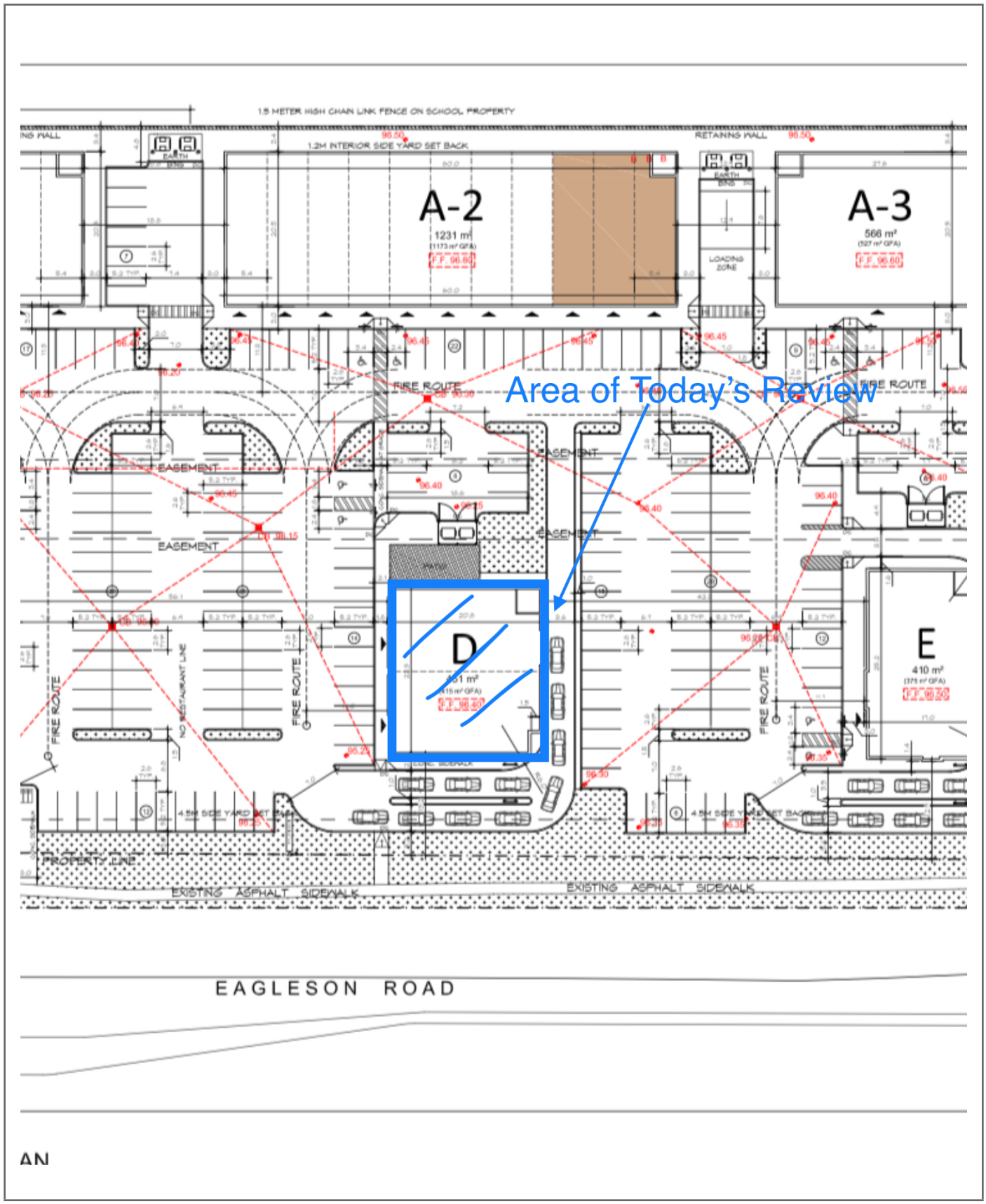

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Site Memorandum

TO: Urbandale Corporation DATE: Dec 23.2021 8:00 AM FILE: PM13772

PROJECT: 801 Eagleson - Site Excavation

ADDRESS: 801 Eagleson Road , Kanata

LOCATION: **Proof Roll Review - Building Pads D - View Attached Highlighted Sketch For Locations**

AUTHOR: Cole Caillier

Note: If any recommendations provided by the Paterson Group result in an additional cost, the contractor shall obtain authorization from the owner directly, prior to undertaking the work.

COMMENTS:

Further to your request, Paterson Group (Paterson) completed a site visit today to review the ongoing pre engineering work at the aforementioned site.

Proof Roll Review - Building Pad D - View Attached Highlighted Sketch For Locations

Geotechnical Review

At the time of the review the building pad consisted of well graded engineered fill . A proof roll was conducted with a Smooth Drum roller and a little to no deflection was observed.

To raise the subgrade place up to a maximum of 300mm lifts of crushed engineered fill and consolidate with suitable equipment.

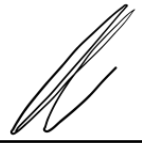
The current elevations are as follows (information provided by Tomlinson):

95.60m

Conforming

The above noted area is considered in general conformance.

Proceed to the next lift and arrange for a proof roll review when ready.



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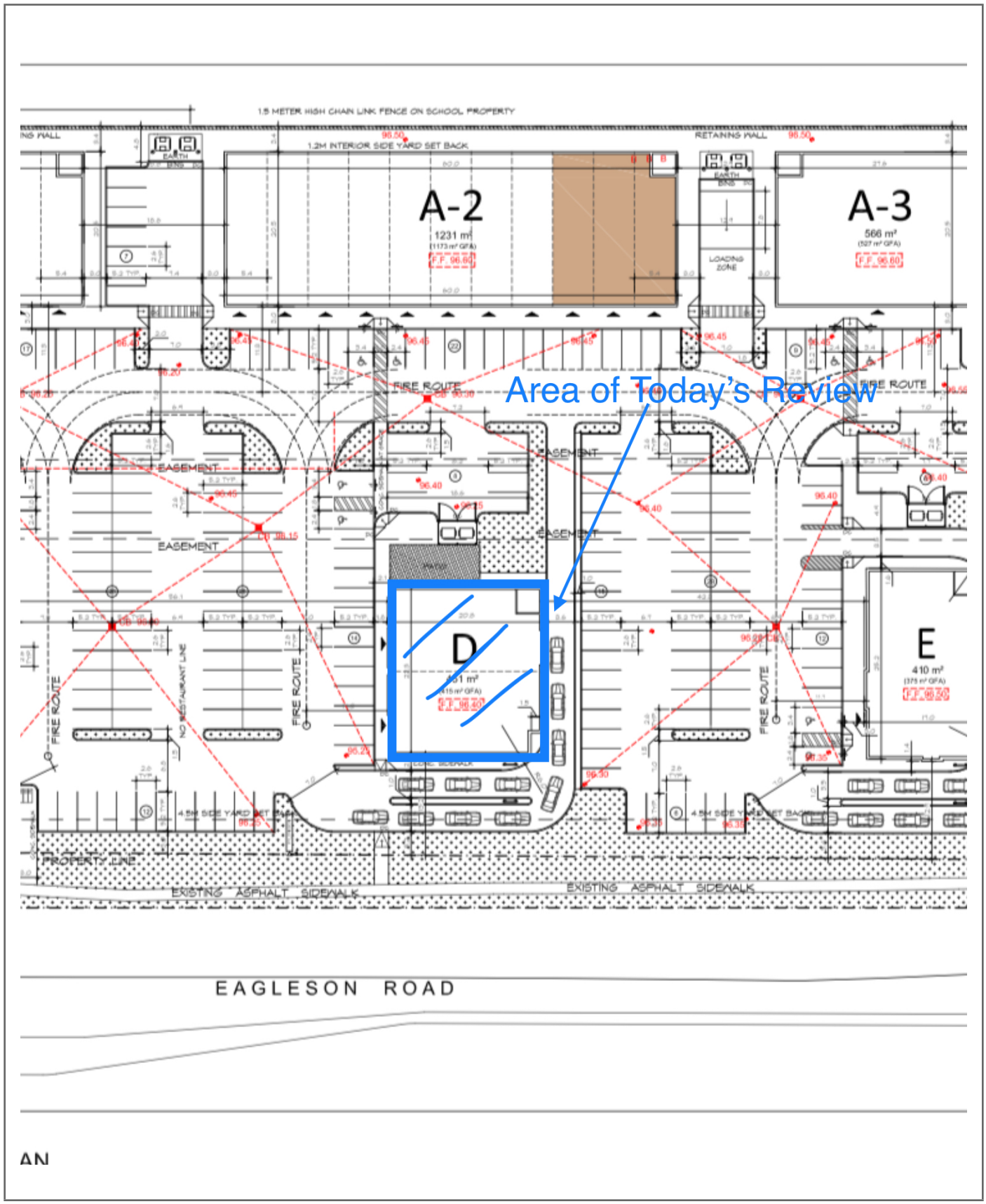

APPENDIX 3

FIGURE 1 - KEY PLAN

FIGURE 2 - AERIAL PHOTOGRAPH - 2011

FIGURE 3 - AERIAL PHOTOGRAPH – 2022

SEISMIC SITE CLASS AND TESTING RESULTS BY OTHERS

DRAWING PG2574-1 - TEST HOLE LOCATION PLAN

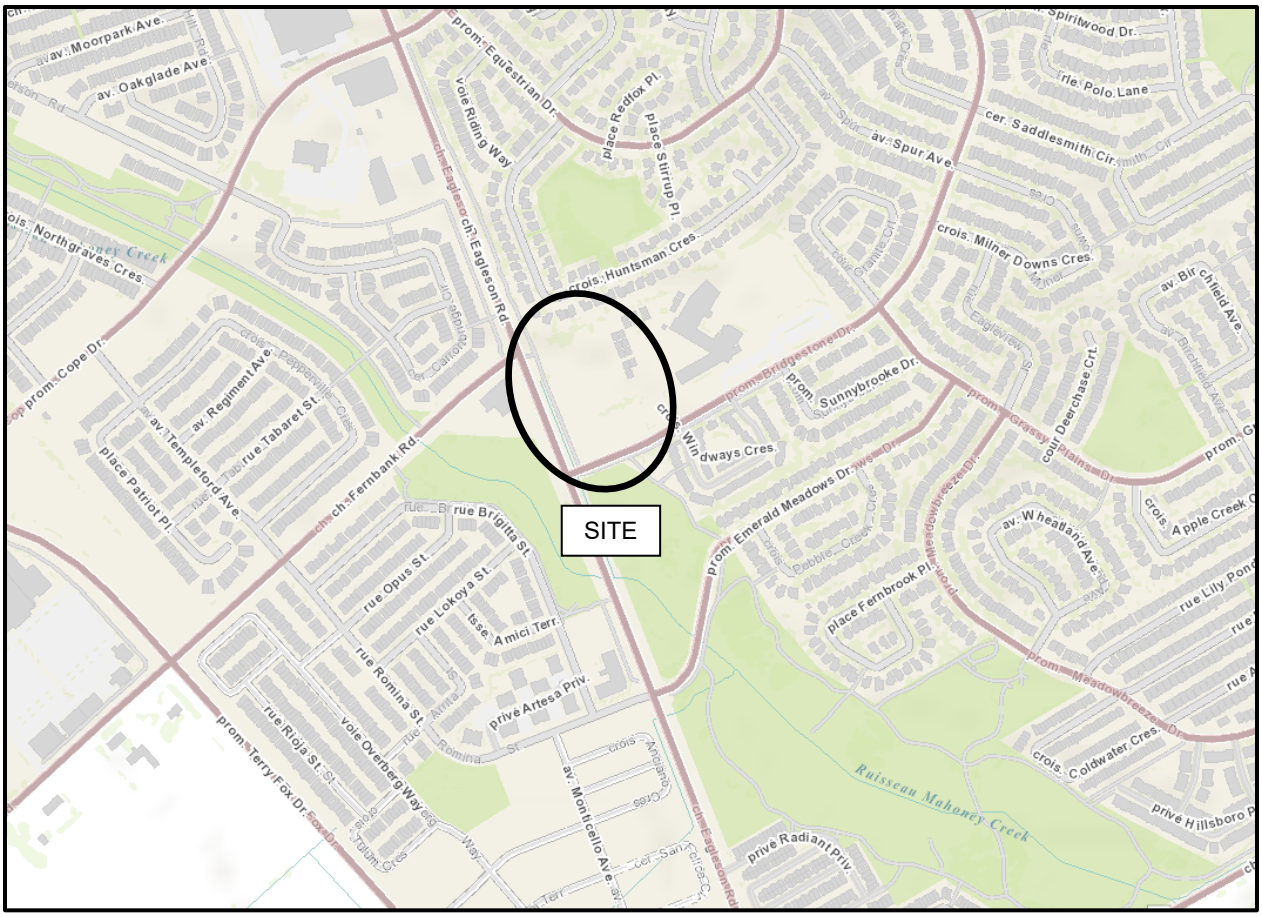

FIGURE 1

KEY PLAN

PATERSON GROUP

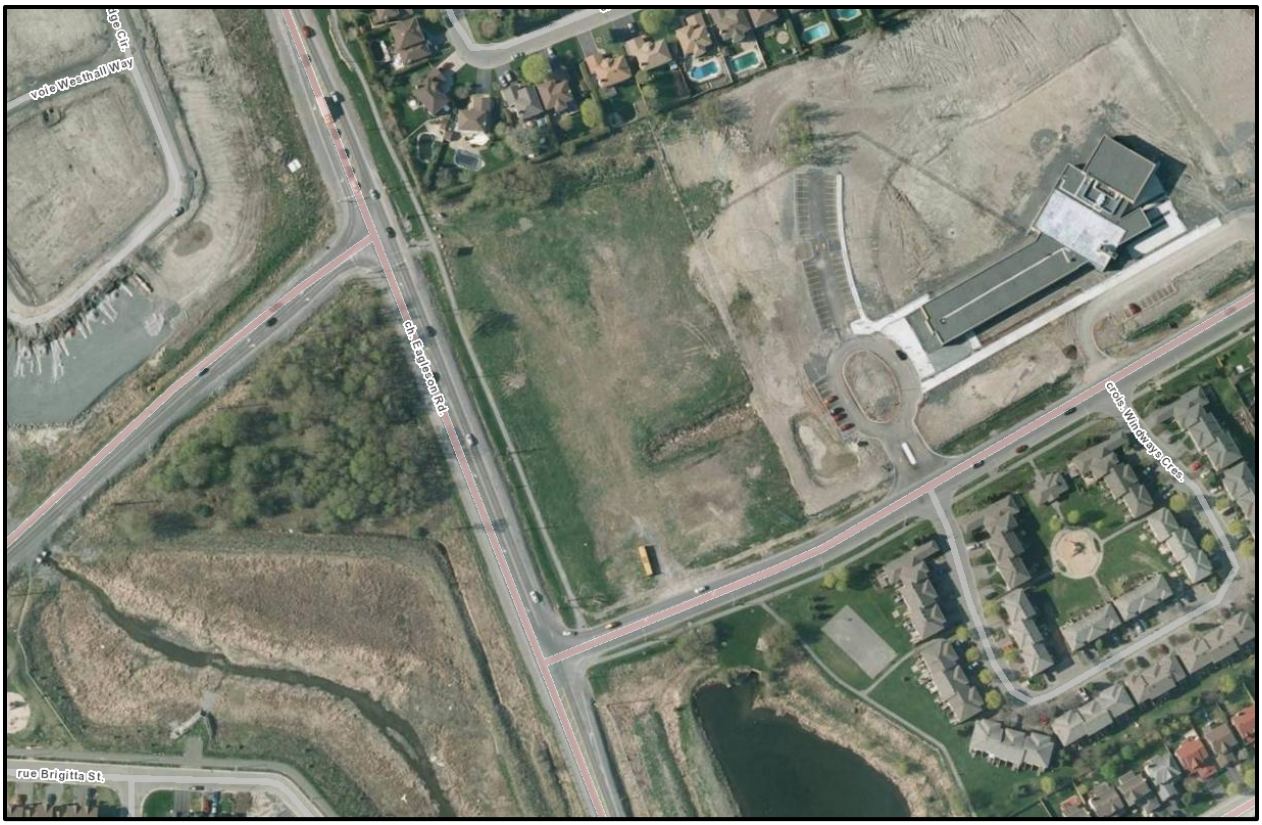

FIGURE 2

Aerial Photograph - 2011

PATERSON GROUP

FIGURE 3

Aerial Photograph - 2022

PATERSON GROUP

TECHNICAL MEMORANDUM

DATE July 20, 2011 **PROJECT No.** 06-1120-227

TO Michel St-Louis
Golder Associates Ltd.

FROM Stephane Sol, Christopher Phillips **EMAIL** ssol@golder.com; cphillips@golder.com

NBCC SEISMIC SITE CLASS TESTING RESULTS:
PROPOSED BRIDLEWOOD PLAZA – 801 EAGLESON ROAD, KANATA, ONTARIO

This technical memorandum presents the processing and results of a Multichannel Analysis of Surface Waves (MASW) test performed for the purpose of National Building Code of Canada Seismic Site Classification for the proposed Bridlewood Plaza, located at 801 Eagleson Road, in Kanata, Ontario. The geophysical testing was performed by Golder personnel on July 6, 2011.

Methodology

The Multichannel Analysis of Surface Waves (MASW) method measures variations in surface wave velocity with increasing distance and wavelength and can be used to infer the rock/soil types, stratigraphy and soil conditions.

A typical MASW survey requires a seismic source, to generate surface waves, and a minimum of two geophone receivers, to measure the ground response at some distance from the source. Surface waves are a special type of seismic wave whose propagation is confined to the near surface medium.

The depth of penetration of a surface wave into a medium is directly proportional to its wavelength. In a non-homogeneous medium surface waves are dispersive, i.e., each wavelength has a characteristic velocity owing to the subsurface heterogeneities within the depth interval that particular wavelength of surface wave propagates through. The relationship between surface wave velocity and wavelength is used to obtain the shear-wave velocity and attenuation profile of the medium with increasing depth.

The seismic source used can be either active or passive, depending on the application and location of the survey. Examples of active sources include explosives, weight-drops, sledge hammer and vibrating pads. Examples of passive sources are road traffic, micro-tremors and water-wave action (in near-shore environments).

The geophone receivers measure the wave-train associated with the surface wave travelling from a seismic source at different distances from the source.

The participation of surface waves with different wavelengths can be determined from the wave-train by transforming the wave-train results into the frequency domain. The surface wave velocity profile with respect to

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Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

wavelength (called the 'dispersion curve') is determined by the delay in wave propagation measured between the geophone receivers. The dispersion curve is then matched to a theoretical dispersion curve using an iterative forward-modelling procedure. The result is a shear-wave velocity profile of the tested medium with depth, which can be used to estimate the dynamic shear modulus of the medium as a function of depth.

Field Work

The MASW field work was conducted on July 6, 2011, by personnel from the Golder Mississauga office. For the MASW test, a series of 24 low frequency (4.5 Hz) geophones were laid out at 3 metre intervals. A seismic weight drop of 45 kg was used as a seismic source for this investigation. Seismic records were collected with seismic sources located 15 and 30 metres from and collinear to the geophone array. An example of an active seismic record collected is shown in Figure 1 (below).

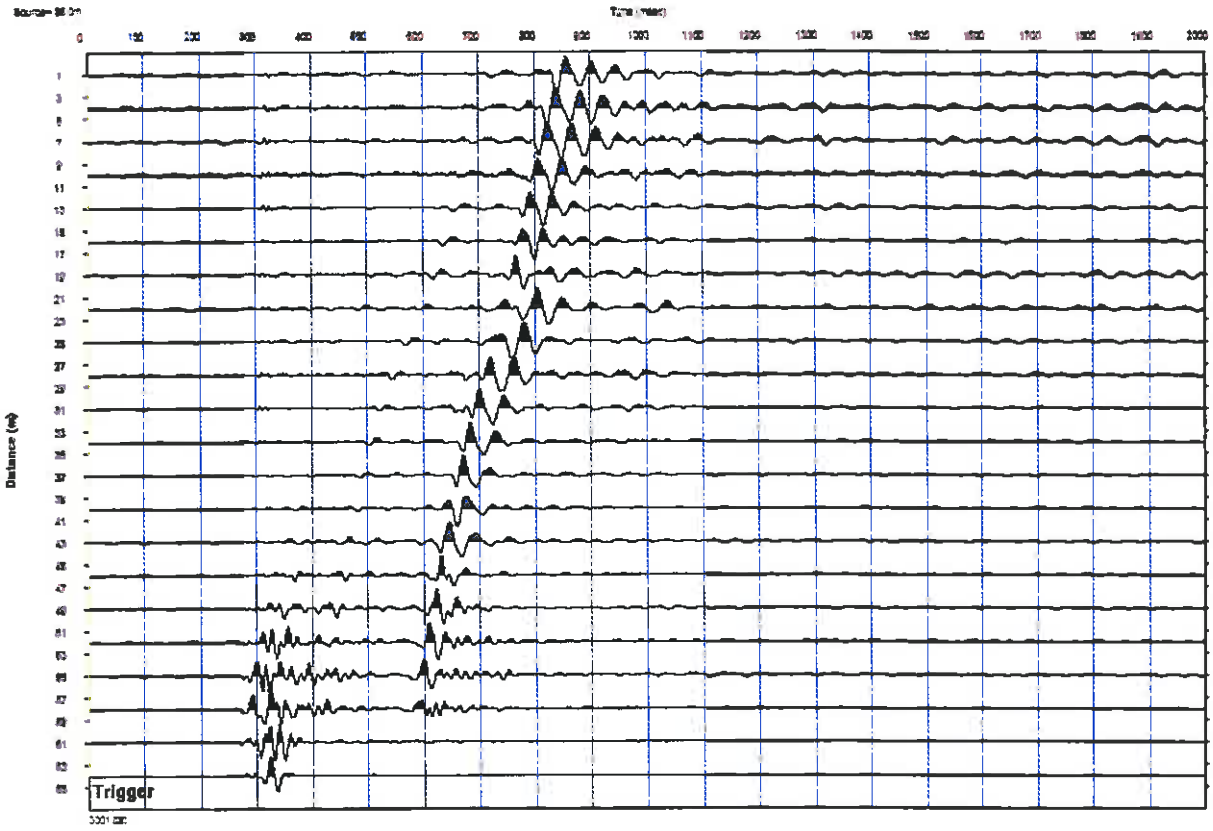


Figure 1: Typical seismic record collected at the site.

Data Processing

Processing of the MASW test results consisted of the following main steps:

1) Transformation of the time domain data into the frequency domain using a Fast-Fourier Transform (FFT) for each source location;

2) Calculation of the phase for each frequency component;

3) Linear regression to calculate phase velocity for each frequency component;

4) Filtering of the calculated phase velocities based on the Pearson correlation coefficient (r^2) between the data and the linear regression best fit line used to calculate phase velocity;

5) Generation of the dispersion curve by combining calculated phase velocities for each shot location of a single MASW test; and

6) Generation of the stiffness profile, through forward iterative modelling and matching of model data to the field collected dispersion curve.

Processing of the MASW data was completed using the SeisImager/SW software package (Geometrics Inc.). The calculated phase velocities for a seismic shot point were combined and the dispersion curve generated by choosing the minimum phase velocity calculated for each frequency component as shown in Figure 2. Shear-wave velocity profiles were generated through inverse modelling to best fit the calculated dispersion curves.

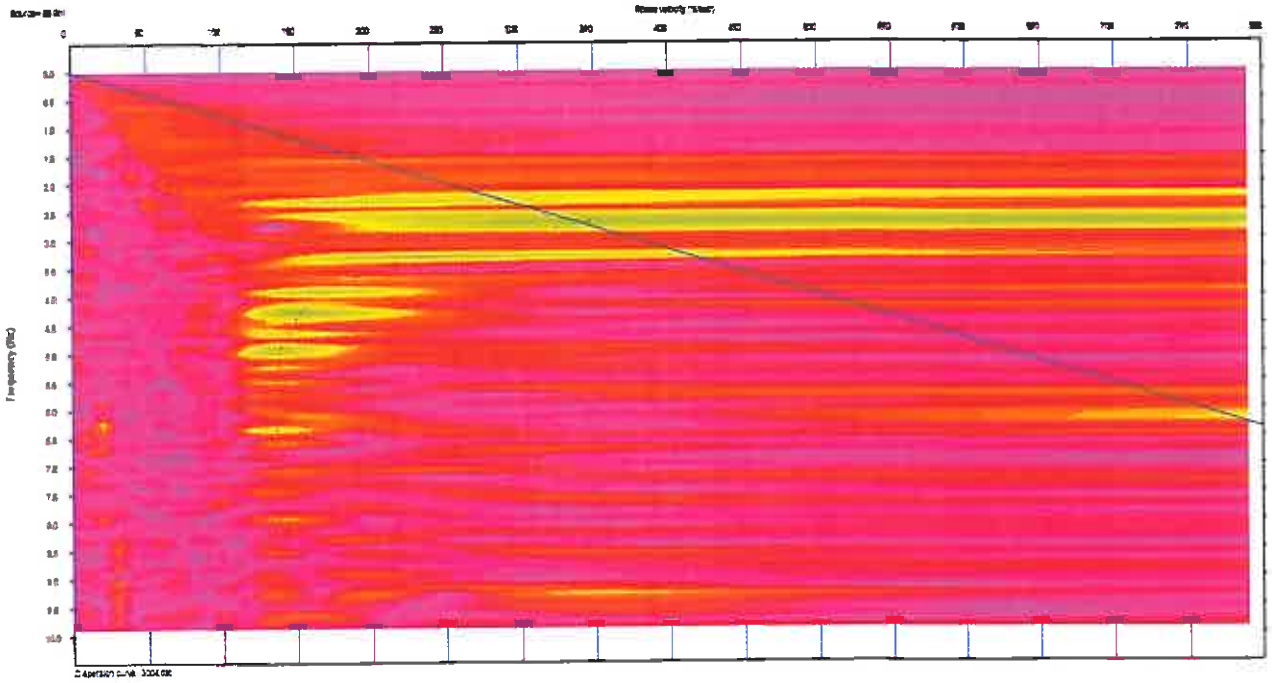


Figure 2: MASW Dispersion Curve Picks (red dots).

The minimum measured surface wave frequency with sufficient signal-to-noise ratio to accurately measure phase velocity was approximately 2.8 Hz.

Results

The MASW test results are presented in Figure 3, which present the calculated shear-wave velocity profiles measured from the field testing. The results have been inferred using a weight drop located at 15 metres from the first geophone. The field collected dispersion curves are compared with the model generated dispersion curves in Figure 4. There is a good correlation between the field collected and model calculated dispersion curves, with a root mean squared error of 2.45% (or 4.5 m/s).

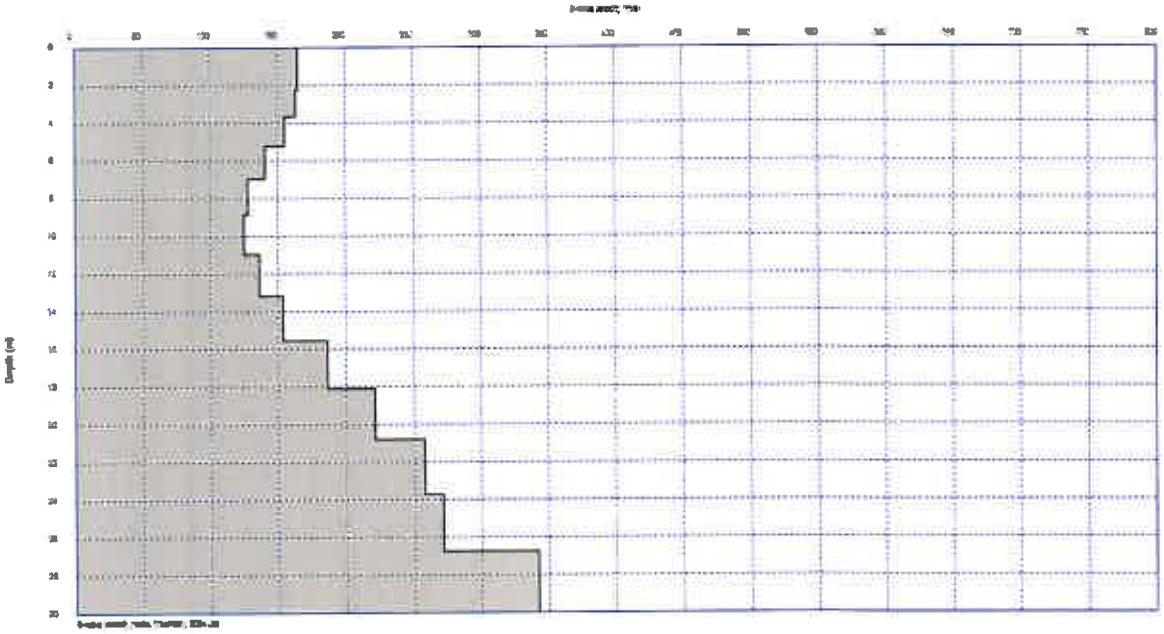


Figure 3: MASW Modelled Shear-Wave Velocity Depth profile.

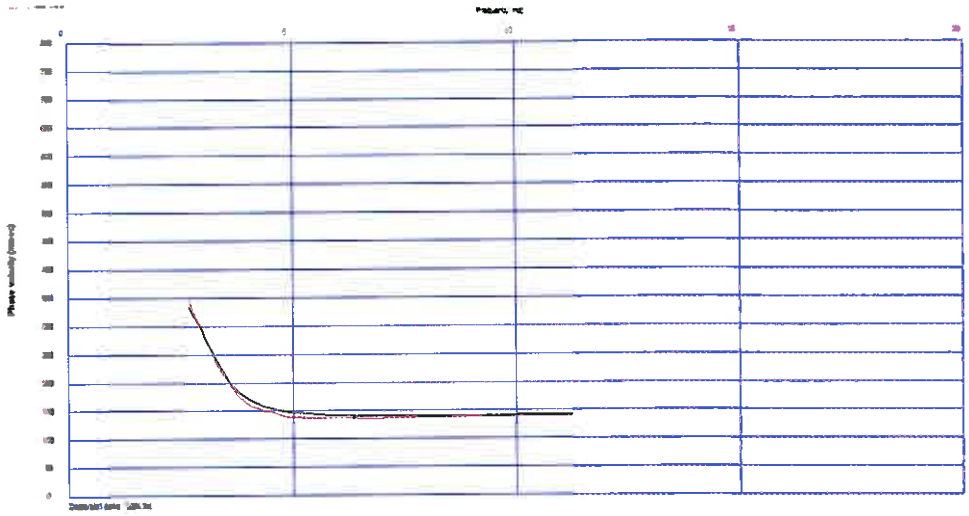


Figure 4: Comparison of Field (red line) vs. Modelled Data (black line).

To calculate the average shear-wave velocity as required by the National Building Code of Canada, 2005 (NBCC2005), the results were modelled to 30 metres below the ground surface. The average shear-wave velocity was found to be 181 m/s (Table 1).

Table 1: Shear-Wave Velocity Profile

Depth(m)		Shear-Wave Velocity	Travel Time
From	To	(m/s)	(s)
0.0	1.1	165	0.006479
1.1	2.3	165	0.00747
2.3	3.7	163	0.008573
3.7	5.3	155	0.010071
5.3	7.0	141	0.012275
7.0	8.9	128	0.014797
8.9	11.0	125	0.016503
11.0	13.2	136	0.01634
13.2	15.6	154	0.015496
15.6	18.1	187	0.013672
18.1	20.9	221	0.01228
20.9	23.7	258	0.011177
23.7	26.8	271	0.011244
26.8	30.0	342	0.009395
		Travel Time to 30 m	0.165771
		Average Shear-Wave Velocity	**181**

It is understood that the footings for Buildings A, B, C, and D at the proposed Bridlewood Plaza will be approximately 1 to 1.5 metres below the present average grade, which would result, based on testing results, in a calculated Vs30 velocity of 184.5 to 187 m/s.

Closure

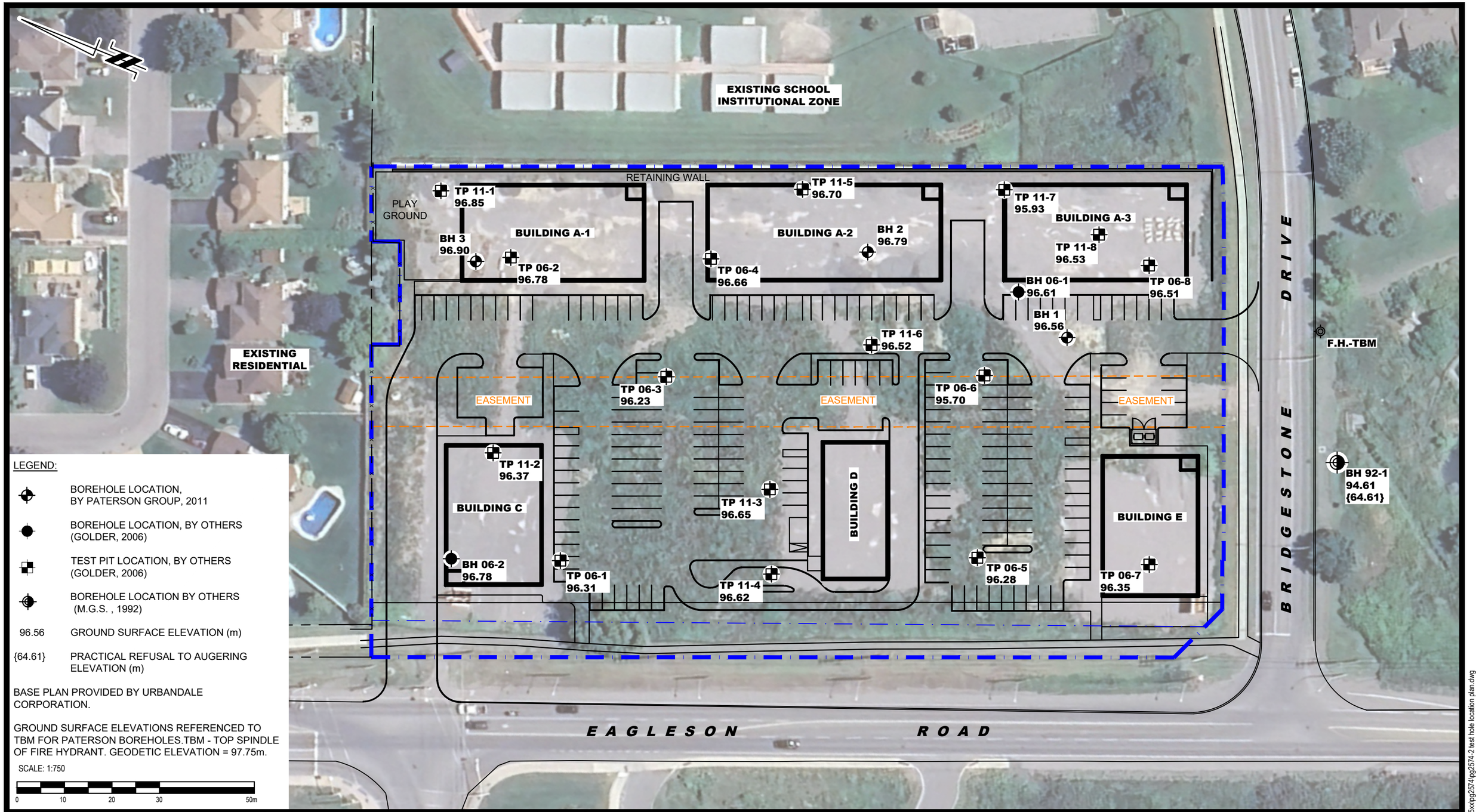
We trust that this Technical Memorandum meets your needs at the present time. If you have any questions or require clarification, please contact the undersigned at your convenience

Stephane Sol, Ph.D.
Geophysics Group

Christopher Phillips, P.Geo.
Senior Geophysicist, Associate

SS/CRP/ss/crp/wlm/cg

n:\active\2006\other offices\06-1120-227 eagleson masw (june,2011)\reporting\06-1121-227 tm masw eagleson report 20jul11 rev.docx



LEGEND:

- BOREHOLE LOCATION, BY PATERSON GROUP, 2011
- BOREHOLE LOCATION, BY OTHERS (GOLDER, 2006)
- TEST PIT LOCATION, BY OTHERS (GOLDER, 2006)
- BOREHOLE LOCATION BY OTHERS (M.G.S. , 1992)
- 96.56 GROUND SURFACE ELEVATION (m)
- {64.61} PRACTICAL REFUSAL TO AUGERING ELEVATION (m)

BASE PLAN PROVIDED BY URBANDALE CORPORATION.

GROUND SURFACE ELEVATIONS REFERENCED TO TBM FOR PATERSON BOREHOLES.TBM - TOP SPINDLE OF FIRE HYDRANT. GEODETIC ELEVATION = 97.75m.

SCALE: 1:750

0 10 20 30 50m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

URBANDALE CORPORATION
GEOTECHNICAL REPORT
PROPOSED COMMERCIAL DEVELOPMENT
801 EAGLESON ROAD
OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:750	Date: 09/2024
Drawn by: GK	Report No.: PG2574-1
Checked by: NP	Dwg. No.: PG2574-2
Approved by: DG	Revision No.:

11x17

p:\autocad drawings\geotechnical\pg25xx\pg257x\pg2574-2 test hole location plan.dwg