SHALLOW SUBSOIL AND GROUNDWATER SITE INVESTIGATION

Fairways at Delacour

Prepared for:

Canal at Delacour Golf Club

December, 2016

099-105-16

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APPENDICES

1.0 INTRODUCTION

Almor Testing Services Ltd. was retained, at the request of Mr. Robert Wescott, on behalf of Canal at Delacour Golf Club to perform a Shallow Subsoil and Groundwater Site Investigation for a proposed Residential/Commercial Development. The proposed development is located at the intersection of Highway 791 and Highway 564, approximately 6 miles east of the eastern limits of the City of Calgary and lies within W1/2 Sec.19 Twp. 25, Rge. 27 W4M, within Rocky View County, Alberta. Appendix "A" presents a Site Plan for reference, indicating the approximate test hole locations.

The purpose of the geotechnical investigation was to advance test holes to evaluate subsurface soil and groundwater conditions, within the project boundaries. This report summarizes the results of the field and laboratory tests and presents preliminary geotechnical recommendations for the design and construction of site grading, underground services, residential concrete foundations and asphaltic concrete pavement structures.

2.0 INVESTIGATION DETAILS

2.1 Field Program

Eight (8) test holes were drilled, within the project boundaries, on December 5, 2016, at the approximate locations shown on the Site Plan, included in Appendix "A". The test holes were drilled using a truck mounted solid stem auger drill rig (Strata Star 10), operated by All Service Drilling Ltd. based out of Airdrie, Alberta. The Test Hole Logs are presented in Appendix "B", Plates 1 to 8.

The test holes were logged and samples classified in accordance with the Modified Unified Soil Classification System, described in Appendix "B", Plate 9. Pocket Penetrometer testing, as well as Standard Penetration Testing (SPT), was conducted at regular intervals. Disturbed soil samples were returned to Almor's Calgary laboratory, for further classification and testing.

Open-end standpipe piezometers were installed in all test holes, upon completion, to facilitate future shallow groundwater monitoring. The open-end static piezometers consisted of 25mm diameter PVC standpipe, backfilled with soil cuttings and a 0.3m bentonite plug, to limit surface infiltration.

2.2 Laboratory Program

A laboratory testing program meeting applicable ASTM and/or CSA standards was undertaken on the samples secured in the field. The laboratory testing consisted of the following:

- Soil classification;
- Determination of the natural moisture content;
- Atterberg limits on selected representative samples;
- Water soluble sulphate testing on selected samples;
- Grain size analysis on selected samples; and
- CBR testing on a representative sample.

The results of the laboratory program are presented graphically on the Test Hole Logs in Appendix "B". All soil samples will be stored for 60 days following issuance of this report. The samples will then be discarded, unless Almor is instructed otherwise.

3.0 SUBSURFACE CONDITIONS

3.1 General

The soil conditions encountered in the test holes were relatively uniform across the site and excluding surficial topsoil and browns consisted of silty clay glacial (till), overlying bedrock. In Test Holes TH2 to TH4 and TH7, a seam of silty sand was encountered embedded, within the silty clay till. The following is a general description of the soil units encountered. Detailed descriptions of the soil strata encountered are provided on the Test Hole Logs, in Appendix "B".

Surficial topsoil/browns were encountered in all test hole locations, during the current geotechnical field program. The thickness of the topsoil/browns varied from 100mm to 500mm. This thickness could be greater in some isolated areas.

A silty sand deposit was encountered embedded, within the silty clay till deposit in four (4) of the test holes advanced. This material was described as olive in colour, moist to wet and was in a compact to dense condition, in terms of relative density. It should be noted, trace amounts of clay were also noted, within this deposit. These soils were fine to coarse grained. This deposit was encountered, within the silty clay till, at varying depths of 2.0m to 3.0m below existing ground surface.

The predominant soil encountered was a glacial silty clay (till) deposit. The till was found in all test holes advanced, throughout the site. The deposit was stratified, with layers of silt and fine sand. The till was described as olive in color, in a damp to moist condition and varied between stiff to very stiff in terms of consistency. An Atterberg Limit Index Property test performed on a soil sample from TH1 at a 2.0m depth indicated a Liquid Limit of 27 and a Plastic Limit of 12, which results in a Plasticity Index of 15. The test classifies this soil as low plastic clay (CL). An Atterberg Limit Index Property test completed on another sample at TH5, at a 3.0m depth, indicated a Liquid Limit of 36 and a Plastic Limit of 15, resulting in a Plasticity Index of 21. The test classifies this soil as medium plastic clay (CI). From the observation of the soil encountered and the Atterberg Limit Testing conducted, we consider the majority of the silty clay till soil is low to medium plastic soil. The till deposit was encountered below the topsoil/browns deposit and extended a maximum depth of 7.2m, where drilling terminated.

Bedrock was encountered in all test hole locations. The bedrock material was typically described as mudstone. The bedrock is hard in soils terminology and friable or “extremely weak to very weak” in bedrock terminology, to depths where isolated competent stringers or seams may be encountered. Auger refusal was not encountered.

This deposit was described as olive to grey in colour, damp and of an extremely weak (R0) to very weak strength (R1). An Atterberg Limit Index Property Test was performed on a bedrock sample and indicated a Liquid Limit of 33 and a Plastic Limit of 19, resulting in a Plasticity Index of 14. The test classifies these soils as low plastic clay (CL). Bedrock was encountered at various depths ranging from 2.0m to 7.2m below existing grade.

Table 1 summarizes the depths of each of the major stratigraphic units detailed on the Test Hole Logs, presented in Appendix "B":

TABLE 1
STRATIGRAPHY TABLE

	---------- Depth Below Existing Ground Surface (m) ----------				
Test Hole No.	Topsoil/ Browns	Silty Clay (Till)	Silty Sand	Clayey Silt	Bedrock
1	0.0 - 0.1	0.1 - 4.5	--	--	4.6 - 6.4
2	0.0 - 0.1	0.1 - 1.9 3.0 - 5.5	1.9 - 3.0	--	5.5 - 7.2
3	0.0 - 0.1	0.1 - 2.0 4.2 - 5.0	2.0 - 4.2	--	5.0 - 6.0
4	0.0 - 0.1	0.1 - 3.2 4.7 - 6.0	3.2 - 4.7	--	6.0 - 7.5
5	0.0 - 0.5	0.5 - 7.2	--	--	7.2 - 8.5
6	0.0 - 0.3	0.3 - 2.0	--	--	2.0 - 4.5
7	0.0 - 0.3	0.3 - 1.7 2.7 - 4.2	1.7 - 2.7	--	4.2 - 6.0
8	0.1 - 0.3	0.1 - 1.3 2.0 - 6.0	--	1.3 - 2.0	6.0 - 7.5

It should be noted that the transitions between the classified soil units are gradual, rather than the distinct unit boundaries as shown on the Test Hole Logs.

3.2 Groundwater Conditions

Groundwater levels were measured at completion of drilling, three days, seven days and fourteen subsequent. Table 2 summarizes the water level readings recorded, within the standpipes.

TABLE 2
GROUNDWATER CONDITIONS

		---------- Depth Below Existing Ground Surface (m) ----------			
Test Hole No.	Depth of Standpipe	At Completion Dec 5/16	Dec 8/16	Dec 13/16	Dec 19/16
1	6.4	6.0	4.1	4.09	4.05
2	7.2	7.1	3.3	3.19	3.19
3	5.7	5.0	3.2	3.07	3.08
4	4.7	4.0	3.8	3.76	3.74
5	8.5	7.0	4.6	3.62	3.56
6	3.8	dry	dry	dry	dry
7	4.8	3.5	2.0	1.99	2.07
8	7.2	6.8	5.9	2.23	2.09

It is apparent there is perched water in the sand seams of the glacial till. Groundwater levels fluctuate seasonally in response to climatic conditions and may be 0.9m higher in the June to August recharge period. Presently, it would appear groundwater is a minor consideration at the site. Overland drainage and utility excavation, with pipe zone drainage will relieve the perched water conditions, to the depth of the utilities.

4.0 GEOTECHNICAL RECOMMENDATIONS

4.1 General

Development of the facility using balanced cut/fill earth quantities is feasible, depending on local variations in soil stratigraphy and topography. Based on the soils encountered in the test holes, the exposed subgrade soils over most cut areas are expected to consist silty sand or silty clay (till). In those areas where fill is required, it is anticipated that the local soil will be used.

It is anticipated that groundwater will not have an impact on the site grading operations to a depth of 2.0m to 4.0m. Based on soil and groundwater conditions, generally favourable site grading conditions are anticipated.

The subsurface conditions are considered to be suitable, relative to foundation support for the development. The geotechnical factors believed to be pertinent for the design and construction of the proposed development are presented below. These factors are based on the interpretation of subsoil conditions found in the current eight (8) test holes advanced, within the project boundaries. The recommended design values are subject to engineering observations and approval by a qualified geotechnical engineer.

4.2 General Site Grading

The composition and consistency of the soils encountered at the site indicate excavation, with conventional earthmoving equipment, and/or hydraulic excavators, is considered feasible. Based on groundwater conditions, noted during the current geotechnical program, earthworks associated with site grading may not be hampered by groundwater seepage. In general, where the local soils are to be used as general engineered fill, moisture conditioning may be required. Extensive fill placement required for general site grading should not be performed, during freezing conditions or using frozen soils. The native inorganic soil encountered in the test holes is suitable material for use as general engineered fill. General engineered fill is to be compacted to a minimum of 98 percent of the Standard Proctor maximum dry density (SPMDD), at a moulding moisture of optimum to 3 percent above optimum moisture content (OMC) for cohesive soils and $\pm$3 percent OMC for cohesionless soils.

Organic material shall be completely removed to the depths of native mineral soils. Following the stripping, the exposed subgrade is to be proof rolled to identify any soft, loose or non-uniform areas. Areas detected are to be over-excavated and replaced with approved material. A geogrid and/or geotextile may be incorporated to improve the condition of the soft subgrade soils. This will have to be made at the time of construction.

The findings in the current geotechnical program did not indicate areas of engineered fill. However, if encountered, uncontrolled fill is to be completely removed from all structural areas, such as building envelopes or roadways and stockpiled. Excavated mineral fill, may be re-used as general engineered fill, as noted above.

Final site grades are to direct surface water to areas away from proposed structures and promote rapid drainage of surface runoff into local storm water sewers. Landscape gradients of at least 1.5% are recommended to reduce the amount of ponding in localized areas. Parking lots or landscaping, within two meters of building perimeters should be graded away from the structures at a minimum gradient of 2%. Down spouts should direct discharge away from buildings. The soil backfill beneath the topsoil around proposed structures should also slope down and away from the building.

4.3 Utility Trench and Excavation Stability

Based on the topography of the site, excavation stability is not a concern for the construction of the proposed development. Groundwater is a consideration below the water table elevation in the excavations. However, if seepage is encountered during construction, the flows will be manageable with conventional trenching and sump pumps.

In context with preliminary design depths, it is anticipated that utilities will range in depth from 2.5m to 4.0m below the existing grades. This will be encountering the silty clay (till) subsoils and/or bedrock. Excavation of the site soils can be readily completed with large backhoe equipment. The use of ripper may be required, during excavation if isolated stringers of competent bedrock in encountered.

Periodic cleaning of debris at the base of the slope may be required, if sloughing occurs. Care will be required to avoid sloughing and failure of the sidewalls. Temporary surcharge loads, such as stocks of material or heavy equipment, should be kept back from excavation faces, a distance equal to at least one half the excavation depths.

For excavations deeper than 1.2m, side slopes must be cut back as required by the Occupational Health and Safety Act. If space does not permit the slopes to be cut back, some form of temporary shoring must be installed to protect workers in the trench. Almor can forward recommendations for shoring, upon request.

The latest edition of the Construction Safety Regulations of the Occupational Health and Safety Act of Alberta should be followed for all excavations.

4.4 Foundation Requirements

4.4.1 Continuous and Spread Footings

Continuous and spread footings for the structures, supported on the native undisturbed soils may be designed based on a maximum allowable static bearing pressure of 190 kPa (4000 psf). General engineered fill, as noted in section 4.2, would also be suitable for maximum allowable static bearing pressure of 145 kPa (3000 psf). These values have been factored by 0.5 of Ultimate Limit State (ULS) bearing values, per the Foundation Manual.

The bearing surfaces must be cleaned of all loosened or softened soils. Foundation excavation bearing surfaces are to be protected from the ingress of free water and frost before, during and after footing construction. Soil bearing observations are to be performed for all units, so as to verify footing subgrade conditions and consider specific foundation construction recommendations. Footings are to be constructed in accordance with the current Alberta Building Code, National Building Code, and any relevant local requirements.

Provided that the recommendations contained herein are followed, the anticipated settlement of the footings should be well within generally acceptable tolerances. Footing settlements are anticipated to be limited to a total of 25mm or less, bearing on the native soils and/or engineered fill.

Should other foundation types or retaining walls be incorporated in the subdivision design, further review of the soil conditions may be required to provide soil design parameters.

4.4.2 Lateral Earth Pressure

All below grade walls will be required to resist lateral earth pressures from the soil and any additional surcharge loads and should be designed in at rest condition. The lateral soil pressure (p) distribution may be assumed to be triangular in shape and increase linearly with depth according to:

$$P_0 = K_o(\gamma z + q)$$

where
- P_0 = lateral earth pressure at rest condition (no wall movement occurs) at depth z (kPa)
- K_o = coefficient of lateral earth pressure “at rest” condition
- γ = unit weight of soil
  - Use γ = 19 kN/m^3 for silt/clay backfill
  - Use γ = 21.0 kN/m^3 for gravel backfill
- z = depth below final site grade adjacent to wall (m)
- q = surcharge load (kPa)

For engineered fill behind foundation and retaining walls, a K_o value of 0.5 is recommended for design.

Hydrostatic pressure may not need to be considered in the wall design, provided a below grade weeping tile system is installed at the lowest wall elevation and adequately connected to the onsite drainage system.

Backfill around the concrete wall should not commence before the concrete has reached a minimum of two-third of its 28 day strength. Only hand operated compaction equipment should be employed within 600mm of the wall. Caution should be used during compaction of backfill to reduce the lateral loads caused by compaction. A clay cap of 600mm thickness should be placed

at the ground surface to reduce infiltration of the surface water. To avoid differential wall pressure, the soil should be placed and compacted evenly around the wall. A compaction standard of 95% of SPMDD is recommended.

4.4.3 Weeping Tile and Damp Proofing

As per city of Calgary Storm Water Design Manual, 2011 a weeping tile drain is required where the lowest top of footing (LTF) is less than 2.50m above the seasonally adjusted water table.

Based on above criteria and the present of shallow bedrock and very stiff clay soils that can lead to perched ground water conditions, perimeter weeping tile is a requirement around foundations. Groundwater tables typically are the highest in June to August, during recharge conditions. We recommend a minimum footing elevation of 0.6m above corrected high groundwater levels, in consideration of yearly conditions. The weeping tile is to connect to a storm sewer system. It should be installed with positive slope away from foundation elements and in accordance with the current Alberta Building Code requirements. Backfill with suitable compacted mineral soils around the foundation will also reduce the ingress of water.

Basement walls, if constructed, should be damp-proofed in accordance with Building Code requirements.

4.5 Frost Protection

For protection against frost action, exterior footings should have at least 1.2m of soil cover above top of footing for footings supporting heated structures. In the case of an unheated structure, the top of footings should be provided with a minimum ground cover of 2.0m. Interior footings in a permanently heated structure may be constructed at any depth, provided suitable soils with the design allowable bearing capacity are available.

Based on the native materials, the water lines should be provided with a minimum of 2.7m soil cover, as per the current City of Calgary Standard Specifications for Waterworks Construction.

If the minimum soil cover cannot be achieved practically, a properly designed insulation system could be used to reduce the thickness of soil cover required. Almor can provide additional recommendations for the use of rigid insulation, if required, after the foundation details are available.

4.6 Concrete Type

Water soluble sulphate content tests were conducted on the insitu soils encountered and indicate, in isolated locations at a 3.0m depth, the potential degree of sulphate attack may be considered moderate (as per CSA A23.1-14, Table 3). Accordingly, Sulphate Resistant (Type HS or HSb) Portland cement is recommended for all concrete in contact with the native soils. A minimum strength of 30 MPa at 56 days is recommended, with a maximum w/c ratio of 0.50 and +5 percent air entrainment. In addition, all concrete must be designed in accordance with the CSA A23.1-14 e.g. air-entraining agents are required in freeze/thaw zones. Fine grained soils imported to the site, are to be tested for the presence of sulphates and the above recommendations modified, if required.

All concrete must be supplied in accordance with the current Alberta and National Building Code requirements. All concrete mix design, and construction, should be carried out in accordance with the CAN/CSA A23.1-14 and A23.2-14 Specifications. All other concrete requirements for roadway surface structure and underground utility construction should comply with the current City of Calgary Construction Specifications.

4.7 Structural Pavement Designs

The following are preliminary structural asphalt pavement sections and construction procedures, used in the planning stages of this development. The subgrade soil conditions, within the roadways at the site, are anticipated to consist of a uniform mixture of silty clay, with some gravel materials. Dependent on the proposed design grades, a 150mm depth of scarification and recompaction may be required, to moisture condition the soils.

The following preliminary structural pavement design sections are presented, as evaluated with Rocky View County guidelines. The proposed structural pavement designs are based on an engineered "soaked condition" C.B.R. value of 3.0% and construction on similar subgrade materials in the area.

Sample #	Moisture Content (%)		C.B.R. Value (%)	
	Before Soaking	After Soaking	Before Soaking	After Soaking
1	12.5	22.0	13.0	3.0

Materials	Minimum Thickness of Material (mm)
Residential Roads	
Type "B" Asphaltic Concrete	*90
25mm Granular Base Crushed Gravel	100
100mm Granular Subbase Gravel	200
Collector Roads	
Type “B” Asphaltic Concrete	140
25mm Granular Base Crushed Gravel	100
100mm Granular Subbase Gravel	200

* May be completed with staged construction of a 50mm base lift and 40mm surface lift at the F.A.C. period.

4.7.1 Construction Recommendations

The recommendations for subgrade construction provided in Section 4.2 are to be followed in the preparation of the subgrade beneath the roadways. Prior to gravel placement, the exposed subgrade is to be proof rolled to identify any soft, loose or non-uniform areas. Areas detected are to be over-excavated and replaced with approved granular material. A geogrid and/or geotextile may be incorporated to improve the condition of the subgrade soils. This will be made at the time of construction. The final subgrade elevation and any sub cut sections are to permit positive subgrade drainage to the catch basins or manholes. Implementation of these measures will significantly reduce the moisture content ingress into the subgrade following construction, minimizing saturation and degradation of the subgrade.

Proper subgrade preparation and subgrade drainage is significant in long term maintenance and this must constitute part of the design. These structural pavement sections are limited, in that they do not contain an insulating component or total granular thickness, to completely eliminate the potential of minor isolated frost heave effects. They are designed to provide a life expectancy of 20 years.

Granular sub-base coarse and granular base coarse gravels should be uniformly compacted in lift thicknesses not exceeding 300mm to a minimum of 98 percent SPMDD at a moulding moisture of ±3 percent OMC and contain no more than 10% passing the 80 micron sieve. All materials supplied and placed in subbase, base and pavement construction must comply with the minimum requirements in the current Standard Specifications, for Street Construction.

4.8 Seismic Considerations

As per the current National Building Code of Canada Table 4.1.8.4A titled *Site Classification for Seismic Site Response*, the native soils encountered may be classified as *stiff soil* (average shear wave velocity 180<360 m/s), to shallow depths. Subsequently, Almor recommends that the proposed project area may be classified as Site Class “D”. At depths in mudstone bedrock we consider very stiff to hard and therefore Class “C” site conditions.

4.9 Erosion Control

A grain size analysis was performed on stiff surficial soil consisted of silty sand, some clay, trace gravel. See attached Grain Size Distribution, in Appendix “C”. The soil texture result indicated the subgrade soils have an organic content of 3.1%, a very fine sand and silt content of 39.7% and a sand content of 24.4% (0.1 - 2mm). The massive soils have a clay content of 36.0 % and is considered to be slow to moderate in an undisturbed condition.

4.10 Quality Control and Observations

The recommendations presented in this report assume an adequate level of observations will be provided, during construction performed by contractors experienced in residential construction. The recommended design values are subject to engineering and approval by a qualified geotechnical engineer.

It is recommended, a qualified and experienced geotechnical firm, such as Almor, be engaged to evaluate designs, observe grading, roadway construction, installation of underground utilities, foundation excavations and to perform the specified materials engineering and testing services.

The frequency of materials engineering and testing services can be provided, once site development concepts, schedules and specifications are established.

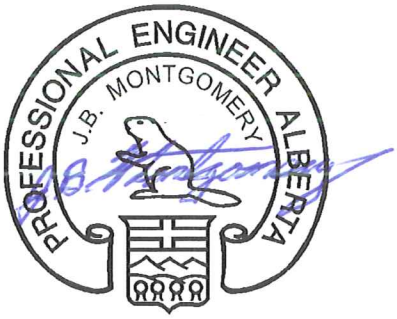
5.0 CLOSURE

This investigation was performed to evaluate the subsurface soil and groundwater conditions for preliminary review of the development of the utility and building grade plans. The geotechnical factors discussed in the report were based on the interpreted subsurface conditions, as found in the eight (8) test hole locations investigated. It should be noted that natural conditions can be variable.

We are to be notified when subsurface conditions, other than those presented herein, are encountered during subsequent investigations or during construction. Construction monitoring is required, and is to be undertaken by qualified personnel to verify requirements contained in this report, as well as the project specifications, are achieved.

This report has been prepared for the exclusive use of Canal at Delacour Golf Club and its agents for specific application to the proposed development, described within this report. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Almor accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,
ALMOR TESTING SERVICES LTD.



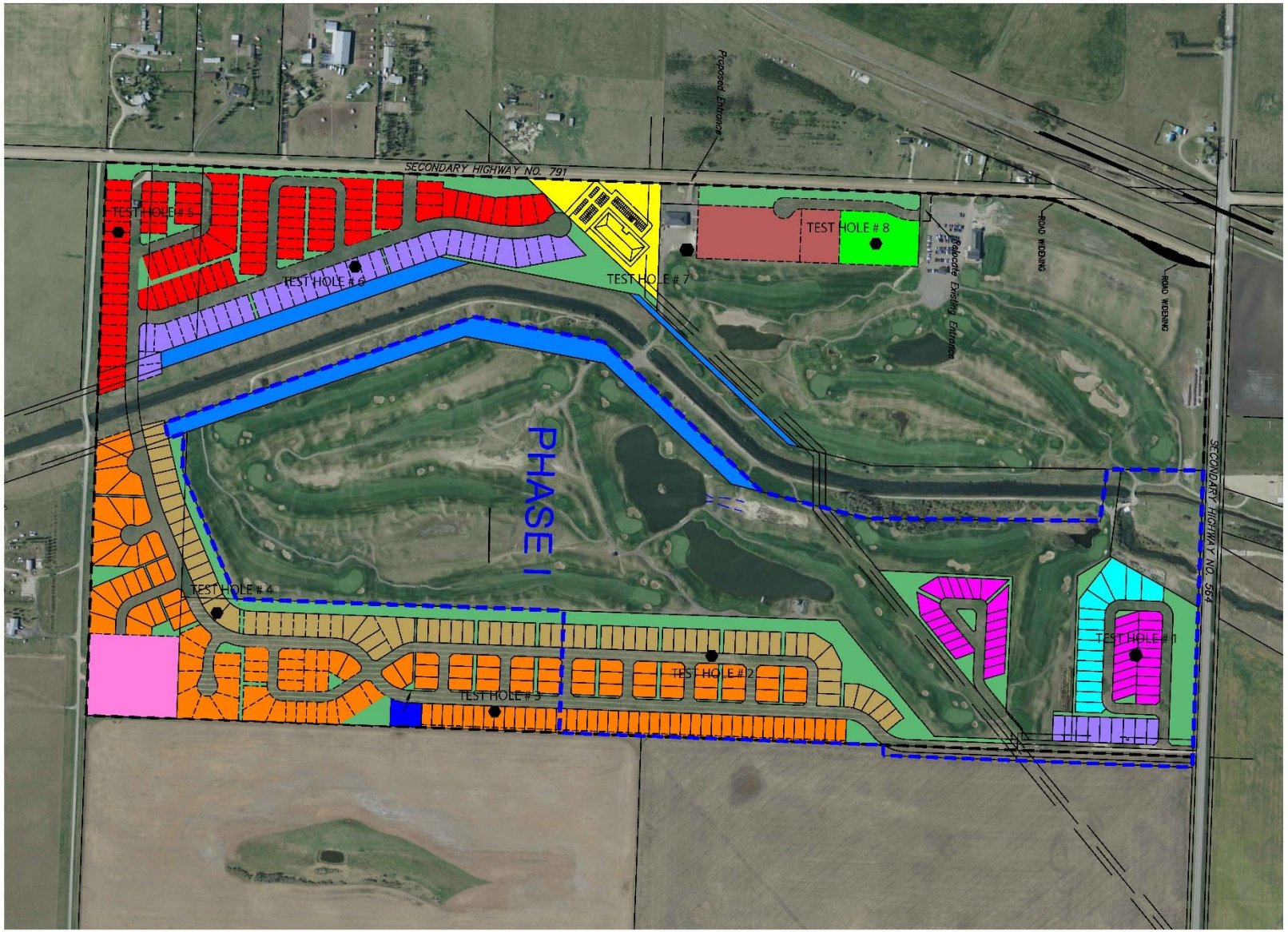
5/01/17

* APEGA Permit to Practice #P2260

J.B. Montgomery, P.Eng.

AA:ms:A05822

APPENDIX A



PROPOSED CONCEPT PLAN

OF

THE FAIRWAYS AT DELACOUR

W 1/2 SEC 19 TWP 25 RGE 27 W4

WITHIN

ROCKYVIEW COUNTY

FOR

THE CANALS AT DELACOUR

OVERALL DEVELOPMENT

COUNTRY RESIDENTAL (1)	
GOLF COURSE ESTATE PREMIUM 18x34 (15)	
GOLF COURSE 15 x 34 (73)	
PARK ESTATES 18 X 38 (36)	
PARK ESTATE PREMIUM 18 X 38 (9)	
SINGLE FAMILY ESTATE 15X38 (94)	
SINGLE FAMILY 15 X 34 (144)	
VILLA 12.5 x 34 (40)	
CONDOMINIUM UNITS (28)	
SENIORS UNITS (45)	
RECREATION/COMMERCIAL SITE	
ENVIRONMENTAL PROTECTION LANDS	
PATHWAY/ TRAILS / OPEN SPACE	
UTILITY	

AREA CALCULATIONS

CERTIFICATE OF TITLES	270.40 ac.
ROADS	23.79 ac.
OPEN SPACE	19.4 ac.
UTILITY	.17 ha.
PHASE I	

NO	DD/MM/YY	DESCRIPTION	BY
6			
5			
4			
3	09/09/2016	DESIGN REVISIONS	RTW
2		DESIGN REVISIONS	RTW
1	17/02/2016 11/05/2015	PRELIMINARY DESIGN	RTW
		REVISIONS	

PROJECT

FAIRWAYS CONCEPTUAL SCHEME

CLIENT

THE CANAL AT DELACOUR

DRAWING TITLE

RTW070 THE CANAL AT DELACOUR

FIGURE 5 LAND USE CONCEPTUAL PLAN

FILE #	SCALE	DATE	DRAWN BY
RTW070	1:2000	17/04/2015	RTW

WESCOTT CONSULTING GROUP

28 Cougarstone Common S.W. Calgary, Alberta T3H 5P5

Phone 403-681-7568 Cell 403-862-2333

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APPENDIX B

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH1

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m) | DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
	TOPSOIL/ORGANICS	
	Silty CLAY (TILL) medium plastic, very stiff, trace sand, trace gravel, olive, damp to moist	
1		2
		4
		6
2		
		8
	- occasional fine to coarse grained sand lens below 2.7 m	
3		10
	- becoming stiff to very stiff, moist	12
4		
		14
	MUDSTONE (BEDROCK medium plastic, "extremely weak to very weak" (R0-R1), grey, damp	
5		16
		18
6		20
	END OF TEST HOLE AT 6.4m	
	- standpipe installed to 6.4m	22
	- groundwater level 6.0m at completion	
7	- test hole backfilled with soil cuttings	
	- bentonite seal placed, 0.3m	24

SAMPLE TYPE: B

MOD UNIFIED SOIL CLASS: CL

WATER CONTENT (%) ●
PLASTIC LIMIT 20 | LIQUID LIMIT 40 60
12 27

COMPRESSIVE STRENGTH
Unconfined ▲
Pocket Pen △
TSF 2 3 4 5
KPa 200 300 400
13
49
30
50

OTHER TESTS
- Sulphate Content <0.10 %
▼ December13, 2016
▼ At completion

KN/m³ 16 18 20 22
PCF 100 120 140
WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■
20 40 60
□ SPT ◪ Case
■ Cone ◹ BT Pen

GROUNDWATER
▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH	6.4 m	DATE DRILLED	December 5, 2016	LOGGED BY	Abdul Alemi	PLATE NO.	1

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH2

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m) | DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
0	**TOPSOIL/ORGANICS**	
	Silty CLAY (TILL) low to medium plastic, stiff to very stiff, trace sand, trace gravel, olive, damp to moist	2
1		4
		6
2	**Silty SAND** compact to dense, trace clay, fine grained, poorly graded, olive, moist	8
3	**Silty CLAY (TILL)** medium plastic, stiff to very stiff, trace sand, trace gravel, trace oxides, trace coaly pieces, olive, damp to moist	10
		12
4		14
	- becoming compact, sandy, moist to wet	16
5		18
	SANDSTONE (BEDROCK) "extremely weak to very weak" (R0-R1), fine to coarse grained, highly weathered, grey, damp	
6		20
		22
7		
	END OF TEST HOLE AT 7.2m	24
	- standpipe installed to 7.2m - groundwater level 7.1m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	26
8		

SAMPLE TYPE | MOD UNIFIED SOIL CLASS

WATER CONTENT (%) ●
PLASTIC LIMIT | LIQUID LIMIT
20 40 60

COMPRESSIVE STRENGTH
Unconfined ▲
Pocket Pen △
TSF 2 3 4 5
KPa 200 300 400

14 (<) 12 30 48

OTHER TESTS

- Sulphate Content <0.10 %

▼ December13, 2016

▼ At completion

KN/m³ 16 18 20 22
PCF 100 120 140
WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■
□ SPT ◪ Case
■ Cone ◹ BT Pen

GROUNDWATER
▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH	7.2 m	DATE DRILLED	December 5, 2016	LOGGED BY	Abdul Alemi	PLATE NO.	2

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH3

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m)

DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
	TOPSOIL/ORGANICS	
	Silty CLAY (TILL) low to medium plastic, very stiff, some sand, trace gravel, olive, damp to moist	2
1		4
		6
2	**Silty SAND** compact to dense, trace clay, fine grained, poorly graded, olive, moist to wet	8
3		10
	- becoming coarse grained, saturated	12
4		14
	Silty CLAY (TILL) medium plastic, stiff to very stiff, trace sand, trace gravel, trace coaly pieces, olive, damp to moist	16
5	**MUDSTONE (BEDROCK** medium plastic, "extremely weak to very weak" (R0-R1), grey, damp	18
6		20
	END OF TEST HOLE AT 6.1m	22
	- standpipe installed to 5.7m - groundwater level 5.0m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	

SAMPLE TYPE

MOD UNIFIED SOIL CLASS

WATER CONTENT (%) ●

PLASTIC LIMIT — LIQUID LIMIT

20 40 60

COMPRESSIVE STRENGTH

Unconfined ▲

Pocket Pen △

TSF 2 3 4 5

KPa 200 300 400

26

OTHER TESTS

Sulphate Content <0.10 %
December13, 2016

At completion

KN/m³ 16 18 20 22

100 120 140

PCF

WET UNIT WEIGHT ○

20 40 60

PENETRATION RESISTANCE ■

□ SPT ◪ Case

■ Cone ◹ BT Pen

GROUNDWATER

Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH 6.1 m

DATE DRILLED December 5, 2016

LOGGED BY Abdul Alemi

PLATE NO. 3

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH4

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m)

DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
	TOPSOIL/ORGANICS	
	Silty CLAY (TILL) low to medium plastic, stiff to very stiff, trace to some sand, trace gravel, trace oxides, trace coaly pieces, olive, moist	
1		2
		4
		6
2		8
		10
3	**Silty SAND** compact to dense, trace gravel, fine to coarse grained, poorly graded, olive, moist to wet	
		12
4	- trace clay, fine grained below 4.0 m	14
		16
	Silty CLAY (TILL) medium plastic, stiff to very stiff, trace sand, trace gravel, olive, moist	
5		18
		20
6	**MUDSTONE (BEDROCK** medium plastic, "extremely weak to very weak" (R0-R1), grey, damp	
		22
7		24
	END OF TEST HOLE AT 7.5m	
8	- standpipe installed to 4.7m - groundwater level 4.0m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	26

SAMPLE TYPE: B

MOD UNIFIED SOIL CLASS

WATER CONTENT (%) ●
PLASTIC LIMIT 20 40 60 LIQUID LIMIT

COMPRESSIVE STRENGTH
Unconfined ▲
Pocket Pen △
TSF 2 3 4 5
KPa 200 300 400

31

41

OTHER TESTS

Gravel 5.3 %
Sand 31.7 %
Silt 28.9 %
Clay 34.1 %

- Sulphate Content <0.10 %

▼ December13, 2016
▼ At completion

KN/m³ 16 18 20 22
PCF 100 120 140
WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■
20 40 60
□ SPT ◪ Case
■ Cone ◹ BT Pen

GROUNDWATER
▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH 7.5 m

DATE DRILLED December 5, 2016

LOGGED BY Abdul Alemi

PLATE NO. 4

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH5

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m)

DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	MOD UNIFIED SOIL CLASS	WATER CONTENT (%) ● PLASTIC LIMIT / LIQUID LIMIT	COMPRESSIVE STRENGTH Unconfined ▲ Pocket Pen △	OTHER TESTS
	TOPSOIL/ORGANICS						
	Silty CLAY (TILL) medium plastic, stiff to very stiff, trace to some sand, trace gravel, olive, damp to moist	2					
1		4				14	
	- occasional fine grained sand lens below 1.5 m	6					
2	- becoming stiff	8					
		10		CI	15 / 36	13	- Sulphate Content <0.10 %
3	- stiff to very stiff, trace oxides, trace coaly pieces below 3.0 m	12					▼ December13, 2016
4		14				15	
	- occasional coarse grained sand lens below 4.7 m	16					
5	- becoming very stiff	18					
6		20				34	
		22					
7		24					▼ At completion
	MUDSTONE (BEDROCK medium plastic, "extremely weak to very weak" (R0-R1), olive, damp	26					
8		28					
	END OF TEST HOLE AT 8.5m						
9	- standpipe installed to 8.5m - groundwater level 7.0m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	30					
		32					

WATER CONTENT (%) ● PLASTIC LIMIT 20 40 60 LIQUID LIMIT

COMPRESSIVE STRENGTH Unconfined ▲ Pocket Pen △ TSF 2 3 4 5 KPa 200 300 400

KN/m 16 18 20 22

PCF 100 120 140

WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■ 20 40 60

□ SPT ◪ Case ■ Cone ◥ BT Pen

GROUNDWATER ▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH 8.5 m

DATE DRILLED December 5, 2016

LOGGED BY Abdul Alemi

PLATE NO. 5

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH6

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m) | DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)	SAMPLE TYPE	MOD UNIFIED SOIL CLASS	WATER CONTENT (%) ● PLASTIC LIMIT / LIQUID LIMIT 20 40 60	COMPRESSIVE STRENGTH Unconfined ▲ Pocket Pen △ TSF 2 3 4 5 KPa 200 300 400	OTHER TESTS
0	**TOPSOIL/ORGANICS**						
	Silty CLAY (TILL) medium plastic, stiff to very stiff, trace sand, trace gravel, olive, damp to moist	2	B		●	△	
1		4	B		●	△	
	- very stiff below 1.5 m	6	B		●	15 □\ △	- Sulphate Content 0.14 %
2	**MUDSTONE (BEDROCK** medium plastic, "extremely weak to very weak" (R0-R1), olive to olive/yellow, damp	8	B		●		
3		10	B	CI	● 19 33	50 □\	
		12					
4		14	B		●		
			B		●		
	END OF TEST HOLE AT 4.5m						
	- standpipe installed to 3.8m - test hole dry at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	16					
5							

KN/m³ 16 18 20 22 | PCF 100 120 140 | WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■ 20 40 60
□ SPT ◪ Case ■ Cone ◹ BT Pen

GROUNDWATER ▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH	4.5 m	DATE DRILLED	December 5, 2016	LOGGED BY	Abdul Alemi	PLATE NO.	6

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH7

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m) | DATUM

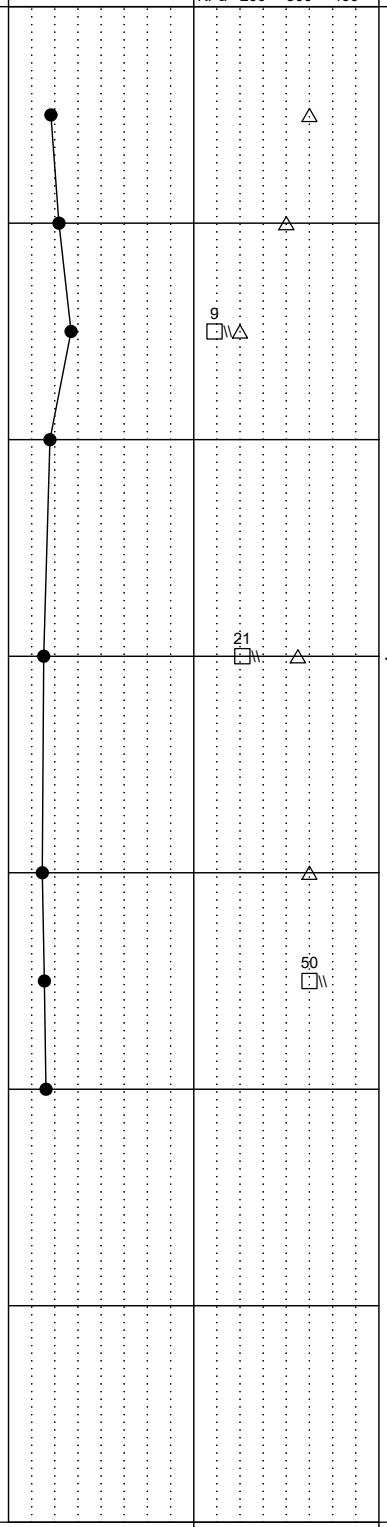
DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
	TOPSOIL/ORGANICS	
	Silty CLAY (TILL) low to medium plastic, stiff to very stiff, trace to some sand, trace gravel, trace coaly pieces, olive, damp to moist	2
1		4
	Silty SAND compact, fine grained, poorly graded, olive, moist to wet	6
2	- trace clay below 2.0 m	
		8
	Silty CLAY (TILL) medium plastic, stiff to very stiff, trace sand, trace gravel, olive, moist	10
3	- occasional coarse grained sand lens below 3.2 m	
		12
4		
	MUDSTONE (BEDROCK medium plastic, "extremely weak to very weak" (R0-R1), olive to olive/yellow, damp	14
		16
5		
		18
6		
	END OF TEST HOLE AT 6.1m	20
	- standpipe installed to 4.8m - groundwater level 3.5m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	22

SAMPLE TYPE

MOD UNIFIED SOIL CLASS

WATER CONTENT (%) ●
PLASTIC LIMIT — LIQUID LIMIT
20 40 60

COMPRESSIVE STRENGTH
Unconfined ▲
Pocket Pen △
TSF 2 3 4 5
KPa 200 300 400



OTHER TESTS

December13, 2016

- Sulphate Content <0.10 %

At completion

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

KN/m 16 18 20 22
PCF 100 120 140
WET UNIT WEIGHT ○

PENETRATION RESISTANCE ■
□ SPT ◪ Case
■ Cone ◹ BT Pen

GROUNDWATER
Date Measured

COMPLETION DEPTH	6.1 m	DATE DRILLED	December 5, 2016	LOGGED BY	Abdul Alemi	PLATE NO.	7

PROJECT: FAIRWAYS AT DELACOUR

PROJECT NO.

HOLE NO. TH8

CLIENT: WESTCOTT CONSULTING INC.

DRILL TYPE SOLID STEM AUGER

GEODETIC ELEVATION (m)

DATUM

DEPTH (m)	SOIL DESCRIPTION	DEPTH (ft)
	TOPSOIL/ORGANICS	
	Silty CLAY (TILL) low to medium plastic, stiff to very stiff, trace to some sand, trace gravel, trace coaly pieces, olive, damp to moist	2
1		4
	Clayey SILT compact, non to low plastic, olive, moist to wet	6
2	**Silty CLAY (TILL)** medium plastic, stiff to very stiff, trace to some sand, trace to some gravel, trace coaly pieces, olive, moist	8
3	- becoming very stiff	10
		12
4	- occasional coarse grained sand lens below 3.9 m	14
		16
5		18
6	**MUDSTONE (BEDROCK** medium plastic, "extremely weak to very weak" (R0-R1), olive, damp	20
		22
7		24
	END OF TEST HOLE AT 7.5m	
8	- standpipe installed to 7.5m - groundwater level 6.8m at completion - test hole backfilled with soil cuttings - bentonite seal placed, 0.3m	26

SAMPLE TYPE

MOD UNIFIED SOIL CLASS

WATER CONTENT (%) ●

PLASTIC LIMIT — LIQUID LIMIT

20 40 60

COMPRESSIVE STRENGTH

Unconfined ▲

Pocket Pen △

TSF 2 3 4 5

KPa 200 300 400

6

16

24

45

OTHER TESTS

- Sulphate Content 0.12 %

▼ December13, 2016

▼ At completion

KN/m³ 16 18 20 22

100 120 140

PCF

WET UNIT WEIGHT ○

20 40 60

PENETRATION RESISTANCE ■

□ SPT ◪ Case

■ Cone ◹ BT Pen

GROUNDWATER

▼ Date Measured

ALMOR TESTING SERVICES LTD.

TEST HOLE LOG

COMPLETION DEPTH	7.5 m	DATE DRILLED	December 5, 2016	LOGGED BY	Abdul Alemi	PLATE NO.	8

EXPLANATION OF SOIL DESCRIPTIONS AND SYMBOLS SHOWN ON TEST HOLE LOGS

The test hole logs summarize the results of field investigations and, if applicable, also laboratory test data. It should be appreciated that conditions established at a test hole location may not be representative of subsurface conditions across the investigated site. Transitions of the soil stratigraphy, either classified or graphically shown, are gradual, rather than the distinct unit boundaries presented.

SOIL DESCRIPTION AND CLASSIFICATION

Soils are described according to their appearance, lithological composition and probable mode of deposition (genetic type). Expected engineering properties and behaviour of the materials are interpreted relative to the soil type and laboratory test results.

I) DEFINITION OF SOIL TYPES

Material	Grain Size
Boulders	Larger than 300mm
Cobbles	75mm - 300mm
Gravel - Coarse	19mm - 75mm
- Fine	5mm - 19mm
Sand - Coarse	2mm - 5mm
- Medium	425um - 2mm
- Fine	75um - 425um
Silt and Clay	Smaller than 75um

II) COMPOSITION OF SOIL

2.1 Principal Component - Major soil type representing at least 50% by weight of material.

2.2 Minor Component - Minor soil types identified by the following terms with respect to their percentages by weight of material:

"Trace"	:	1% - 10%	"Some"	:	10% - 20%
Modifier "Y"	:	20% - 30%	Connector "and"	:	30% - 50%

III) CONSISTENCY OR STRENGTH OF SOIL

3.1 Coarse Grained Soils - (Principal Component larger than 75um). The following terms are used relative to the Standard Penetration Test (SPT), ASTM D1586:

Description	No. of Blows per Foot
Very Loose	Less than 4
Loose	4 - 10
Compact	10 - 30
Dense	30 - 50
Very Dense	Over 50

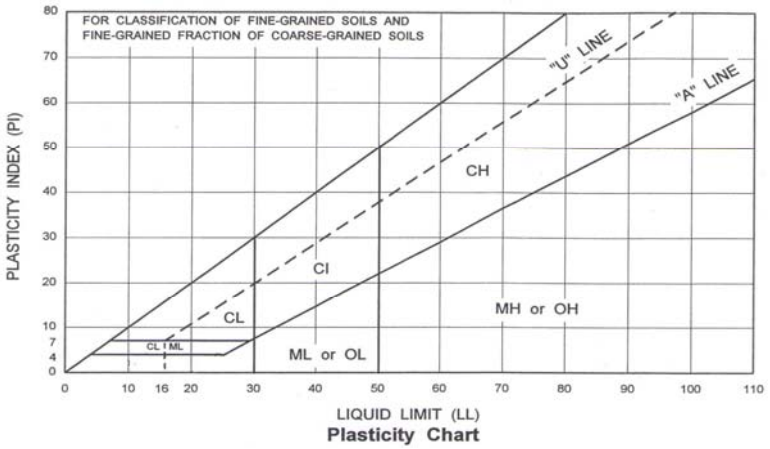
3.2 Fine Grained Soils - (Principal Component smaller than 75um). The following terms are used relative to the unconfined strength and Standard Penetration Test (SPT), ASTM D1586:

	Unconfined Compressive	
Description	Strength kPa (tsf)	No. Blows per Foot
Very Soft	Less than - 24 (0.25)	Less than 2
Soft	24 - 48 (0.25 - 0.5)	2 - 4
Firm	48 - 96 (0.5 - 1.0)	4 - 8
Stiff	96 - 190 (1.0 - 2.0)	8 - 15
Very Stiff	190 - 380 (2.0 - 4.0)	15 - 30
Hard	> 380 (4.0)	Over 30

SOIL CLASSIFICATION SYSTEM (MODIFIED U.S.C.)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
HIGHLY ORGANIC SOILS			**PT**	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR AND OFTEN FIBROUS TEXTURE	
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS (MORE THAN HALF COARSE FRACTION LARGER THAN NO. 4 SIEVE)	CLEAN GRAVELS	**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES. <5% FINES	$C_u = \frac{D_{60}}{D_{10}} > 4$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES. <5% FINES	NOT MEETING ALL ABOVE REQUIREMENTS	
		DIRTY GRAVELS	**GM**	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES. >12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR $I_p < 4$	
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES. >12% FINES	ATTERBERG LIMITS ABOVE "A" LINE OR $I_p > 7$	
	SANDS (MORE THAN HALF COARSE FRACTION LARGER THAN NO. 4 SIEVE SIZE)	CLEAN SANDS	**SW**	WELL-GRADED SANDS, GRAVELLY SANDS. <5% FINES	$C_u = \frac{D_{60}}{D_{10}} > 6$; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			SP	POORLY-GRADED SANDS, OR GRAVELLY SANDS. <5% FINES	NOT MEETING ALL ABOVE REQUIREMENTS	
		DIRTY SANDS	**SM**	SILTY SANDS, SAND-SILT MIXTURES. >12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR Ip < 4	
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES. >12% FINES	ATTERBERG LIMITS ABOVE '"A" LINE OR Ip > 7	
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES NO. 200 SIEVE SIZE)	SILTS BELOW "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		**ML**	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	$W_L < 50$	SEE PLASTICITY CHART BELOW
			MH	INORGANIC SILTS, MICACEOUS OR DIATO-MACEOUS, FINE SANDY OR SILTY SOILS	$W_L > 50$	
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		**CL**	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS	$W_L < 30$	
			CI	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	$W_L > 30, < 50$	
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	$W_L > 50$	
	ORGANIC SILTS AND CLAYS BELOW "A" LINE ON PLASTICITY CHART		**OL**	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	$W_L < 50$	
			OH	ORGANIC CLAYS OF HIGH PLASTICITY	$W_L > 50$	

1. All sieve sizes mentioned on this chart are U.S. Standard, ASTM E11.
2. Boundary classifications possessing characteristics of two groups are given combined group symbols, eg. GW-GC is a well graded gravel sand mixture with clay binder between 5% and 12%.
3. Soil fractions and limiting textural boundaries are in accordance with the United Soil Classification System, except that an inorganic clay of medium plasticity (C) is recognized.



Plasticity Chart

ALMOR TESTING SERVICES LTD.

ROCK CLASSIFICATION AND DESCRIPTION

The following factors are usually incorporated in a test hole log for adequate engineering geotechnical description:

Rock Name. Established names for igneous, metamorphic and sedimentary rocks are used. This could include established local names rather than the actual rock name. It is believed that for engineering purposes classification by mechanical properties is more significant than classified by mineralogy and texture.

Alteration and Weathering State. The following grades are used: fresh, slightly weathered, moderately weathered, highly weathered and decomposed. In some cases of decomposed rocks the material may exhibit plasticity and soil mechanics classification could be used.

Structure and Discontinuities. This includes comments on discontinuities (bedding planes or separation along foliation planes and fissures in igneous or sedimentary rocks) and veins in relation to their type, orientation, frequency, infilling and surface structures. RQD percentage of core fractions that are 100mm (4 in.) or greater in length, relative to length of solid core recovered (defined by Deere et al. as the Rock Quality Designation) is indicative of the fractured state.

Assessment of Strength. The field assessment of rock strength can be aided by simple tests such as the use of a hammer or penknife and supplemented by laboratory testing. Any rock with a strength significantly less than 1 MPa (145 psi) could be described with reference to soil mechanics practice.

Ancillary Geological Information. This might include dip, identification of infill, etc.

TEST DATA AND SAMPLE TYPES

Data obtained from laboratory and field testing are shown in appropriate columns on the test hole logs and at the corresponding depth interval. Abbreviations and graphic symbols are as follows:

w	moisture content	*pp*	pocket penetrometer test
W_P or PL	plastic limit (ASTM D 424)	*Y*	unit weight of soil or rock
W_L or LL	liquid limit (ASTM D 423)	*Y*d	dry unit weight
Ip or PI	Plastic index (LL-PL)	q_u	unconfined compressive strength
☐	undisturbed shelby tube sample or rock core	RQD	rock quality designation
☐	disturbed SPT sample		
B	disturbed bag sample		

APPENDIX C

7505 - 40 Street SE
Calgary, Alberta T2C 2H5
Telephone: (403) 236-8880

Grain Size Distribution

ASTM D-422

Project Fairways at Delacour
Client Canal at Delacour Golf Club
Almor Job # 099-105-16
Date Recieved Dec 5/16
Date Tested Dec 9/16

Test Hole # TH #4
Depth 0.5m
Technician KC

	Overall	< 2mm
Gravel	5.3%	
Sand	31.7%	33.5%
Silt	28.9%	30.5%
Clay	34.1%	36.0%

Sieve Size (mm)	% Passing
100	
50	
40	
20	100.0
10	95.9
5	95.1
2	94.7
1	93.6
0.5	91.2
0.25	83.1
0.10	71.7
0.05	63.0
0.002	34.1

Soil Description Silty SAND, some Clay, trace Gravel (Fine Sandy Loam)

Soil Properties

Natural Moisture Content	14.5	%
Liquid Limit		%
Plastic Limit		%
Plasticity Index		%
Specific Gravity	2.65	
Organic Content	3.11	%

Comments

Gravel	Sand	Silt	Clay