

# Terraprobe

*Consulting Geotechnical & Environmental Engineering  
Construction Materials Inspection & Testing*

**NATURAL HAZARD SETBACK AND  
SLOPE STABILITY REQUIREMENTS  
PROPOSED RESIDENTIAL DEVELOPMENT  
MEAFORD HIGHLANDS RESORT  
3RD LINE, SOUTH OF HIGHWAY 26  
MUNICIPALITY OF MEAFORD, ONTARIO**

**Prepared For:** Meaford A2A Developments Inc.  
c/o Friedman & Associates  
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Attention: Mr. Steve Warsh, President

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**Distribution:**

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## Table of Contents

1.0	INTRODUCTION .....	1
2.0	SITE AND PROJECT DESCRIPTION .....	1
3.0	FIELD WORK .....	2
4.0	SUBSURFACE CONDITIONS .....	3
5.0	SLOPE ASSESSMENT .....	6
6.0	SLOPE STABILITY ANALYSIS .....	7
7.0	TOE EROSION .....	9
8.0	ACCESS ALLOWANCE .....	10

Borehole Logs 1 to 20

Grain Size Analyses

Site Photographs

Figure 1:	Site Location Plan
Figure 2:	Borehole and Section Location Plan
Figure 3:	Development Concept Plan
Figures 4 to 10:	Cross Sections
Figures 11 to 20:	Slope Stability Analysis Results

## **1.0 INTRODUCTION**

We are pleased to present our report on the slope stability assessment carried out for the proposed residential development in Meaford, Ontario. Authorization to complete this investigation was provided by Mr. Steve Warsh, on January 23, 2012.

The purpose of the investigation was to determine the soil, rock and groundwater conditions on the site as they pertain to the natural hazards setback along existing slopes and drainage routes beyond which development may be restricted.

Concurrent with this study was an overall geotechnical investigation reported separately (May 17, 2012).

## **2.0 SITE AND PROJECT DESCRIPTION**

The site is located on the east side of 3rd Line, south of Highway 26, in the Municipality of Meaford, Ontario (see Figure 1 & 2).

It is proposed to proceed with design and construction of full municipal services and internal streets associated with a resort development.

The property is currently open, agricultural land for the most part with some overgrown areas of trees and brush. The site generally falls in grade by about 42m from the south to north (ie: elevation 357 to 315m) on the upper plateau. Further to the north, grades fall significantly along a natural ridge making up portions of the northern property boundary. Georgian Bay is located north of the site.

Four (4) blocks of land dedicated for Stormwater Management Facilities are located throughout the property, and in the areas of Boreholes 3, 6, 12 and 16. The current Development Concept Plan is included as Figure 3 of this report.

There are three (3) main gullies oriented in an approximate north-south direction which cut into the property as well as the main ridge slope along the north property boundary which will be assessed from a slope stability perspective.

A senior soil engineer visited the site (see Figure 1) on March 21, 2012, to visually inspect the various slope conditions, which noted some active erosion and signs of historical slope instability, in preparation for the intrusive subsurface investigation and slope analysis.

Terraprobe has concurrently completed a comprehensive Geotechnical Investigation report for the proposed development and a Pesticide Assessment report under separate covers.

### **3.0 FIELD WORK**

The field work associated with this project comprised of the advancement of twenty (20) sampled boreholes to depths of 6.6 to 9.6m below existing grade. An additional five (5) boreholes were advanced adjacent to the 9.6m boreholes in order to allow installations of deep and shallow monitoring wells in separate holes as requested by Cole Engineering Group Ltd. to assist in their hydrogeologic study of the property.

Borehole locations, depths and installations were selected in consultation with Cole Engineering and the design team. The proposed borehole locations were staked and surveyed by the client's surveyor. Buried service locates were organized by Terraprobe prior to initiating the field investigation.

The field work was completed between March 21 and 26, 2012, using a track-mounted D50T power auger provided by a specialist soil drilling contractor. At the time of drilling, Boreholes 1 and 3 were advanced at different locations than initially proposed and staked due to access constraints including tree cover and sloping ground. The new elevations for these two (2) boreholes were surveyed for elevation by Terraprobe and locations were collected by handheld GPS coordinates.

The sampled boreholes were advanced using Standard Penetration Test methods at regular 0.75 to 1.5 m intervals in each borehole. All soil samples were sealed in plastic containers and returned to our laboratory for further evaluation and testing including moisture content determination and select grain size analyses.

Following completion of the advancement of the boreholes, a standpipe type piezometer comprising of 19 mm diameter PVC tubing slotted at the base was installed in Boreholes 2, 7, 8, 11, 14, 15, 17, 19 and 20 while the remaining shallow and deep boreholes received Schedule 40, 50mm diameter monitoring wells as noted on the attached borehole logs.

A return visit was made to the site on March 29, 2012 to measure static water levels in the installed standpipes and monitoring wells.

The field work (drilling, sampling, testing) was observed and recorded by a member of our engineering staff, who also transported the samples to our geotechnical testing laboratory.

#### **4.0 SUBSURFACE CONDITIONS**

The details of the subsurface conditions encountered at each borehole are presented on the attached Borehole Logs. It should be noted that the conditions are confirmed at the borehole locations only and could vary between and beyond these locations. In addition, the changes in soil stratigraphy delineated on the Borehole Logs have been inferred from non-continuous sampling. In this regard, the changes should be taken as transitions from one soil type to another as opposed to exact planes of geologic change.

In general, the boreholes encountered about 0 to 250mm of topsoil and/or organic stained silt. The native soils were primarily silt with some clay to clayey silt, trace sand and trace gravel (see attached grain size analyses). Occasional sandy seams or layers and cobbles/boulders were also noted as shown on the attached logs.

The upper red, clayey silt generally graded into weathered shale bedrock below depths of about 2 to 5.3m below existing grades (elevations 313.9 to 344.8m). It is typically difficult to distinguish the transition from clayey silt to the underlying weathered shale bedrock. Based on the consistency and the relatively high penetration resistance, this stratum has been interpolated as a highly weathered zone of the bedrock formation.

Coring of the bedrock was not carried out as part of this assignment, however, the bedrock beneath the site is known to consist of Queenston Formation Shale which is comprised of predominantly thinly bedded reddish brown calcareous shale with grey/green bands of inter-bedded argillaceous limestone. The limestone interbeds are typically about 50 to 75m thick however, limestone interbeds of up to 350mm have been reported for this formation. The Queenston Formation shale is of relatively low strength and the harder limestone layers are of medium strength.

All of the boreholes were augered and sampled to their initially proposed drilling depth without grinding auger refusal on the bedrock stratum. This would generally suggest that the soil and bedrock encountered to the investigation extents will be excavatable with heavy, large excavation equipment.

The native soils exhibited moisture contents varying between 24 to 6% and generally decreased with depth. Moisture content in the shale generally ranged from about 5 to 24%. Some perched groundwater should be anticipated in sandy seams/layers.

Across the site, Standard Penetration Tests conducted in each borehole generally indicated 'N' values of about 8 to greater than 50 blows per 0.3 m of penetration with depth in the native soils and shale. Therefore, these soils are considered to be stiff to hard.

The water levels noted during drilling and measured during our return site visit are tabulated below.

Borehole Number	Ground Surface Elevation (m)	Water Level			
		Noted During Drilling		Measured March 29, 2012	
		Depth (m)	Elevation (m)	Depth (m)	Elevation (m)
1A (deep)	316.7	5.8	310.9	6.3	310.4
1B (shallow)	316.7	Dry	-	2.7	314.0
2	324.6	Dry	-	2.6	322.0
3	323.1	6.0	317.1	0.7	322.4
4	325.8	Dry	-	1.4	324.4
5A (deep)	326.3	Dry	-	9.0	317.3
5B (shallow)	326.3	Dry	-	2.0	324.3
6	329.5	Dry	-	3.2	326.3
7	333.0	Dry	-	1.8	331.2
8	331.4	5.8	325.6	1.6	329.8
9	331.7	Dry	-	(+0.1)	331.8
10A (deep)	339.0	1.8	337.2	2.2	336.8
10B (shallow)	339.0	1.8	337.2	0.7	338.3
11	340.5	5.6	334.9	4.1	336.4
12A (deep)	331.3	Dry	-	8.1	323.2
12B (shallow)	331.3	Dry	-	2.0	329.3
13	333.4	Dry	-	2.9	330.5
16A (deep)	324.1	5.5	318.6	5.6	318.5
16B (shallow)	324.1	Dry	-	2.7	321.4
17	341.6	3.3	338.3	3.1	338.5
18	353.6	Dry	-	4.0	349.6
19	347.0	1.8	345.2	1.6	345.4
20	341.2	5.5	335.7	2.0	339.2

It is anticipated that some fluctuations of the groundwater table will occur seasonally and may be higher during wetter seasons and/or years. It is our recommendation that ongoing monthly monitoring of static groundwater levels continue through the spring/summer of 2012 as a minimum and preferably for a full year. Shallow groundwater flow direction appears to generally fall with surface topography from a high point in the central part of the site, along the south property line, down towards the north, east and west. Shallow,

overburden water levels generally fall in elevation from about 350m (Borehole 18) to 314m (Borehole 1). The groundwater levels measured in the deeper, bedrock monitoring wells indicate levels that are about 1.5 to 7m lower than the adjacent, overburden water levels indicating a downward gradient on these upper table lands. A slightly artesian water level was measured at Borehole 9.

Inspection of the eroded gullies depicted generally minor shallow surface flow in an incised channel in the shale (see photographs).

## 5.0 SLOPE ASSESSMENT

The characteristics of the slopes situated across the site are represented by cross sections included as Figures 4 to 10. The sections are taken at the locations selected in consultation with the Grey Sauble Conservation Authority (GSCA), as shown on Figure 2.

The cross sections A-A' to D-D' (Figure 4 to 7) represent the distinct north-facing main ridge slope which shows evidence of active surficial erosion in localized areas. For the most part, the main ridge runs along the north property line in this area with no distinct watercourse located along the slope toe. The inclination along the slope is generally in the range of 1:1 to 6:1 (horizontal to vertical) or flatter with occasional localized steeper sections associated with recent surficial slumping.

Cross sections E-E' to G-G' (Figures 8 to 10) represent the three (3) main gully systems that cut north-south into the site. Some erosion is noted along the banks of these creeks, especially closer to the main ridge slope. It is unknown if the creeks in these three (3) gullies run all year or if they are intermittent, but there appears to be evidence of significant runoff flow during the spring. The inclination along the slopes are generally in the range of 1:1 to 6:1 (horizontal to vertical) or flatter with occasional localized steeper sections associated with undercutting of the shallow creeks as they are incised into the shale.

A visual inspection of the site indicates well established vegetation on the majority of the slopes, including ground cover and mid to large sized trees. Along the main ridge, large sections have eroded and slumped leaving a bare surface near the crest and talus on the lower slope. Localized areas of erosion and slope steepening are noted along the creek gullies. This appears to be primarily due to undercutting by the creeks at the slope toe. Site photographs are appended which show the vegetated portions of the slope, bared sections and the existing creek conditions.

Based on the survey information provided, the main ridge slope toe is situated nearly coincident with the south side of Highway 26. The main slope heights along this ridge are generally about 90 to 100m from toe to crest. The slope heights along the three (3) gully/valley sections on the site range from about 0.5m in the south to about 10 to 14m in the north (ie: near the main ridge).

## 6.0 SLOPE STABILITY ANALYSIS

A detailed engineering analysis of the slope stability was carried out using a computerized version (SLOPE/W by GEO-SLOPE International Ltd.) of the Bishop method of analysis. This method of analysis allows calculation of Factors of Safety for hypothetical or assumed failure through the slope. The analysis method is used to assess potential for movements of masses of soil over a specific failure surface which is often curved or circular.

For a specific failure surface the **Factor of Safety** (FS) is defined as the ratio of the available soil strength resisting movement, divided by the gravitational forces tending to cause movement. A Factor of Safety of 1.0 represents a “limiting equilibrium” condition where the slope is at a point of pending failure since the soil resistance is equal to forces tending to cause movement. A Factor of Safety greater than 1 is required to maintain stability of the slope. The typical Factor of Safety used for engineering design of slopes for stability ranges from about 1.2 to 1.5, for shallow failures depending on the severity of the assumed conditions (groundwater level, seismic loads, tension cracks, etc.).

The analysis was carried out by preparing representative models of the existing slope geometry as provided at the locations of sections shown with subsurface conditions as encountered in the recent borehole investigation and then analyzing numerous failure surface through the slopes in search of the minimum or critical Factor of Safety for specific conditions (see Figures 11 to 17). In addition, hypothetical 2:1, 1.5:1 and 1:1 slope sections were modeled as shown on Figures 18,19,and 20 respectively. This was completed in order to determine the theoretical stable slope condition with a Factor of Safety of 1.5 for the land use on the plateau above the slope.

The results of the field surveying, topographic mapping, and the borehole information, were input for the slope stability analysis. Many calculations were carried out to examine the Factory of Safety for varying depths of potential failure surfaces. The following average soil properties were utilized for the slope strata in the slope stability analysis, based on borehole results.

Soil Strata	Effective Angle of Internal Friction, $\Phi'$ (degrees)	Unit Weight, $\gamma$ (kN/m <sup>3</sup> )	Cohesion, $c'$ (kPa)
Silt to clayey silt, stiff to hard	30	18.5	5
Shale, weathered, hard	28	22	2000

The above soil strength parameters are based on effective stress for long-term slope stability.

The results of the slope stability analyses are summarized on the attached Figures 11 to 20. The minimum Factor of Safety calculated by the analyses were as follows;

	Calculated Minimum Factor of Safety for Side Slopes	Shown on Figure
Existing Section A-A'	7.14	11
Existing Section B-B'	2.77	12
Existing Section C-C'	7.35	13
Existing Section D-D'	7.30	14
Existing Section E-E'	52.77	15
Existing Section F-F'	4.72	16
Existing Section G-G'	9.08	17
Hypothetical Profile (2.0:1 Inclination)	2.27	18
Hypothetical Profile (1.5:1 Inclination)	2.28	19
Hypothetical Profile (1.0:1 Inclination)	1.74	20

For residential settings (Type C: active land-use), the MNR Policy Guidelines allow a minimum Factor of Safety of 1.3 to 1.5 for slope stability as follows:

TYPE	LAND-USES	DESIGN MINIMUM FACTOR OF SAFETY
A	<b>PASSIVE:</b> no buildings near slope; farm field, bush, forest, timberland, woods, wasteland, badlands, tundra	1.10
B	<b>LIGHT:</b> no habitable structures near slope; recreational parks, golf courses, buried small utilities, tile beds, barns, garages, swimming pools, shed, satellite dishes, dog houses	1.20 to 1.30
C	<b>ACTIVE:</b> habitable or occupied structures near slopes; residential, commercial and industrial buildings, retaining walls, storage/warehousing of non-hazardous substances	1.30 to 1.50
D	<b>INFRASTRUCTURE and PUBLIC USE:</b> public use structures and buildings (i.e. hospitals, schools, stadiums), cemeteries, bridges, high voltage power transmission lines, towers, storage/warehousing of hazardous materials, waste management areas	1.40 to 1.50

Based on the analysis results, the natural undisturbed and well vegetated slope is considered to be adequately stable against slope slides when a 1:1 to 1.5:1 (horizontal to vertical) slope or flatter is experienced with a Factor of Safety of at least 1.5.

The analysis confirms the observed site conditions of a largely stable slope for the majority of the site with only some localized surficial erosion.

Based on this engineering analysis, a slope inclination of 1 to 1 (45°) or flatter is generally required, to obtain a minimum Factor of Safety of 1.5. This slope inclination of 1 to 1 (horizontal to vertical) is considered to be the long term stable slope inclination for the site conditions. For a slope height of about 100m, the stable slope crest position will be about 100m (1 x 100m) measured horizontally from the slope toe. Likewise, for a 6m slope height, the stable slope crest position will be about 6m (1 x 6m). This distance is considered the stable slope allowance or set-back.

Based on the above analysis, the crest of the existing slopes are currently beyond or coincident with the stable setback condition for stability.

## **7.0 TOE EROSION**

MNR Policy Guidelines (ref. Natural Hazards Policies (3.1), 2001) also require an erosion allowance set-back equal to 100 years of the average annual erosion rate based on at least 25 years of reliable data. A detailed study can be used to calculate the erosion allowance or, a guideline table can be used based on the soil type and watercourse size.

Based on the current observations within the three (3) site gullies, the creeks at a distance generally less than 15m from the slope toe, minor active erosion along the slope toe and the natural, stiff to hard clayey silt to shale strata, a toe erosion allowance or setback of 5m is recommended from the MNR Technical Guide. No toe erosion allowance is required for the main ridge slope as there is no water body along or near the ridge toe. However, the shale formation has been weathering at some locations which has caused some bare surfaces to be exposed and surficial erosion to occur. An allowance of 5m is recommended for the long-term weathering along the main ridge slope.

For development control purposes, it is recommended that the average minimum toe erosion allowance or set-back may be used and be measured from the average slope toe position along the gully slopes. This erosion set back is in addition to the stability set back value (i.e. based on 1:1 to 1.5:1 slope). The 5m weathering allowance for the main ridge slope is measured at the top of slope rather than the toe.

Based on the topographic survey data provided to Terraprobe, general slope sections along the north-south oriented gullies only exceed 3:1 (horizontal to vertical) inclinations in areas within about 100 to 150m south of the main ridge slope crest. In these areas where slopes are locally steeper than 3:1, the above erosion and slope stability allowance setbacks have been applied. In all cases along these gullies the 5m erosion allowance from the existing creeks plus the 1:1 stability allowance will daylight through the existing stable slopes prior to reaching the existing top of bank or crest. Therefore, the long-term stable slope position will be coincident with the existing crest along these sections of the three (3) north-south gullies and only an access allowance will need to be considered beyond the crest in these areas.

## **8.0 ACCESS ALLOWANCE**

Current policy guidelines for development setbacks are based on slope stability, erosion and access.

MNR suggests an access allowance near slope crests and along one side of a lot, to permit access to slopes for emergency purposes and to carry out stabilization works if necessary. Based on the slope heights of about

6 to 100m at this site, it is Terraprobe's opinion that an access allowance of 6m could be considered more than adequate. This will permit access for excavators, skid-steers and the like if maintenance along the slope is required in the future.

The total development setback is therefore calculated, taken from the main slope toe. The recommended development setback line is shown approximately on the enclosed Figure 2. This line is dependent on the actual slope heights at various points along the slopes. However, it is generally representative of 11m (ie: 5m erosion/weathering and 6m access allowance) in total from the existing main ridge crest of the slope. Along the north-south oriented gullies the erosion and stability allowance will daylight the existing slope, so the 6m access allowance should be measured from the existing slope crest. This will apply to the northerly 100 to 150m of these gully sections where existing slopes are steeper than 3:1 (horizontal to vertical). Where slopes are flatter than 3:1 no hazard allowance or setback will be required from the slope crest as excavation equipment may easily traverse these low slopes as outlined in the MNR Guideline. It is recommended that the final development plan be reviewed with Terraprobe to address any possible localized adjustments in setbacks.

In summary, our analysis has enabled a building setback to be delineated (see Figure 2). Terraprobe has approximately inferred the top of bank/crest location for the existing slopes based on contours from detailed topographic mapping. It is suggested that all buildings, swimming pools, septic beds, etc. that are proposed on the upper plateau (behind the slope crest) be constructed behind this setback line. (11m back from the crest of the main ridge, 6m back from the northerly 100 to 150m of each gully and 0m from the crest of the southerly gully slopes which are generally flatter than 3:1 currently).

Terraprobe also recommends that the structure(s) be sited to allow space for swales or grading away from the crest such that stormwater/runoff is not directed over the slope in a concentrated manner increasing the potential for surface erosion. Where the slope will remain in its natural state, no trees should be cut from the existing slope as the deep root structures contribute to surficial stability and likely are a significant factor in the observed stable slope.

The final grading of slopes on the property should be set at 2:1 (horizontal to vertical) inclination or flatter. If landscaping or grass cutting is required this should at least be at 3:1 (horizontal to vertical) inclinations or flatter. It should also be noted that attempts to provide topsoil and surface protection against runoff on 2:1 slopes may require a few seasons of maintenance until vegetative cover has the opportunity to develop.

Erosion protection within drainage channels will need to be provided in order to support the design velocities and scour anticipated.

It is our understanding that site stormwater will be collected into ponds through lined channels and/or storm sewers and then discharged in a controlled manner to protected surface channels designed by others.

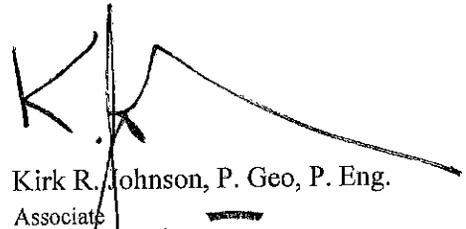
We trust that this report, with attached figures and analyses, will meet your present requirements. If you should have any questions, or if we can be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,  
**Terraprobe Inc.**

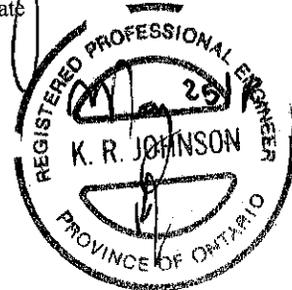


Blair E. Goss, P. Eng.  
Associate

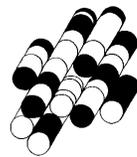
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Barrie Office



Kirk R. Johnson, P. Geo, P. Eng.  
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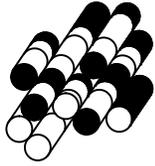
# **BOREHOLE LOGS**



**Terraprobe Inc.**

**BOREHOLE LOGS**

<b>SAMPLING METHOD</b>		<b>PENETRATION RESISTANCE</b>		
SS	split spoon	<b>Standard Penetration Test</b> (SPT) resistance ('N' values) is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a standard 50 mm (2 in.) diameter split spoon sampler for a distance of 0.3 m (12 in.).		
ST	Shelby tube			
AS	auger sample	<b>Dynamic Cone Test</b> (DCT) resistance is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a conical steel point of 50 mm (2 in.) diameter and with 60° sides on 'A' size drill rods for a distance of 0.3 m (12 in.).		
WS	wash sample			
RC	rock core			
WH	weight of hammer			
PH	pressure, hydraulic			
<b>SOIL DESCRIPTION - COHESIONLESS SOILS</b>		<b>SOIL DESCRIPTION - COHESIVE SOILS</b>		
<b>Relative Density</b>	<b>'N' value</b>	<b>Consistency</b>	<b>Undrained Shear Strength, kPa</b>	<b>'N' value</b>
very loose	< 4	very soft	< 12	< 2
loose	4 - 10	soft	12 - 25	2 - 4
compact	10 - 30	firm	25 - 50	4 - 8
dense	30 - 50	stiff	50 - 100	8 - 16
very dense	> 50	very stiff	100 - 200	16 - 32
		hard	> 200	> 32
<b>SOIL COMPOSITION</b>		<b>TESTS, SYMBOLS</b>		
	<b>% by weight</b>	MH	mechanical sieve and hydrometer analysis	
'trace' (e.g. trace silt)	< 10	w, w <sub>c</sub>	water content	
'some' (e.g. some gravel)	10 - 20	w <sub>l</sub>	liquid limit	
adjective (e.g. sandy)	20 - 35	w <sub>p</sub>	plastic limit	
'and' (e.g. sand and gravel)	35 - 50	I <sub>p</sub>	plasticity index	
		k	coefficient of permeability	
		Y	soil unit weight, bulk	
		φ'	angle of internal friction	
		c'	cohesion shear strength	
		C <sub>c</sub>	compression index	
<b>GENERAL INFORMATION, LIMITATIONS</b>				
<p>The conclusions and recommendations provided in this report are based on the factual information obtained from the boreholes and/or test pits. Subsurface conditions between the test holes may vary.</p>				
<p>The engineering interpretation and report recommendations are given only for the specific project detailed within, and only for the original client. Any third party decision, reliance, or use of this report is the sole and exclusive responsibility of such third party. The number and siting of boreholes and/or test pits may not be sufficient to determine all factors required for different purposes.</p>				
<p>It is recommended Terraprobe be retained to review the project final design and to provide construction inspection and testing.</p>				



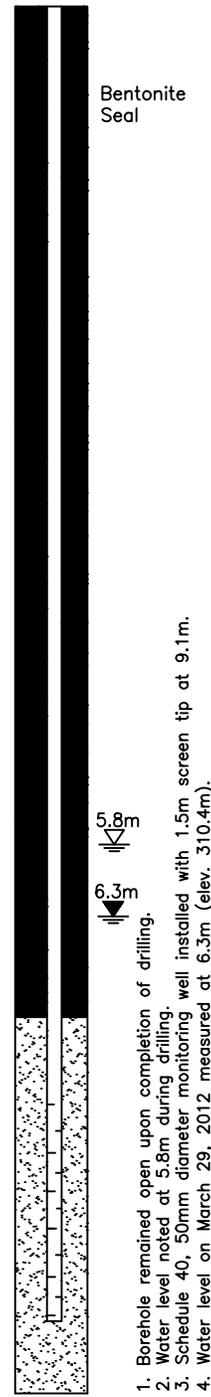
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

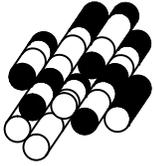
## LOG OF BOREHOLE ..1A..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		316.7											
	75mm - TOPSOIL		0.0											
	Red Stiff to Hard Moist			1	SS	9	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	25	x							
				3	SS	40	x							
2				4	SS	50/150mm								
			313.9											
3	Red Hard Moist to Wet		2.8	5	SS	86		x						
4	SHALE, with limey inter beds, weathered, thinly bedded			6	SS	50/150mm								
				7	SS	50/150mm								
5				309.5										
6			7.2	8	SS	50/50mm								
7	Grey Hard Wet			9	AS	50/50mm								
8	CLAYEY SILT, to SHALE, grinding on hard layers													
9				307.1										
	End of Borehole		9.6											



1. Borehole remained open upon completion of drilling.
2. Water level noted at 5.8m during drilling.
3. Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 9.1m.
4. Water level on March 29, 2012 measured at 6.3m (elev. 310.4m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..1B..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES		PENETRATION RESISTANCE PLOT $X_x$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH kPa							
						20	40	60	80	nat.V - +	Q - ●	rem.V - ⊕	
0	GROUND SURFACE		316.7										
	See Borehole Log 1A for strata description.		0.0										
3	End of Borehole		313.7										<p>1. Borehole remained open upon completion of drilling.</p> <p>2. Water level noted dry during drilling.</p> <p>3. Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 3.0m.</p> <p>4. Water level on March 29, 2012 measured at 2.7m (elev. 314.0m).</p>
			3.0										

D-50T Crawler-mounted Drill Rig / Solid Stem Augers



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..2..

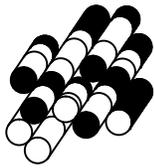
PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80	10	20	30	
0	GROUND SURFACE		324.6											
	50mm - TOPSOIL		0.0											
	Red Stiff to Hard Moist			1	SS	8	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	20	x							
				3	SS	33	x							
				4	SS	39	x							
				5	SS	67	x							
4	Red Hard Moist		320.6											
	SHALE, with limy inter beds, weathered, thinly bedded		4.0											
				6	SS	50/125mm								
			318.0											
			6.6											
	End of Borehole													
7														
8														
9														

Bentonite Seal

2.6m

1. Borehole remained open upon completion of drilling.
2. Water level noted dry during drilling.
3. 75mm standpipe installed with 3m slotted screen tip at 6.1m.
4. Water level on March 29, 2012 measured at 2.6m (elev. 322.0m).



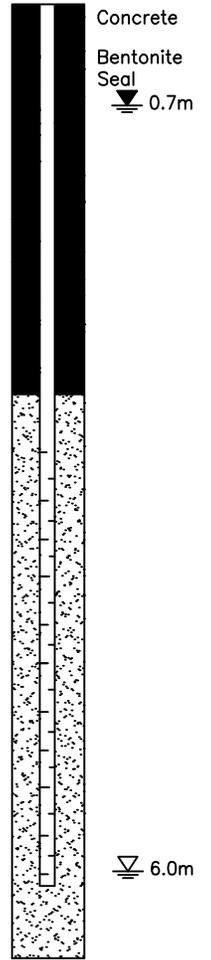
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

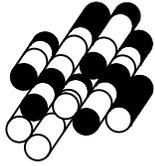
## LOG OF BOREHOLE ..3..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		323.1											
	Red Stiff to Hard Moist		0.0	1	SS	7	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	19	x							
2				3	SS	36	x							
3			320.5	4	SS	50/125mm								
	Red Hard Moist		2.6											
4	SHALE, with limy inter beds, weathered, thinly bedded. with wet sand seam noted at 4.8m			5	SS	50/150mm								
5				6	SS	50/150mm								
6				7	SS	50/65mm								
			316.5											
7	End of Borehole		6.6											
8														
9														



- Borehole remained open upon completion of drilling.
- Water level noted at 6.0m during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 3m slotted screen tip at 6.1m.
- Water level on March 29, 2012 measured at 0.7m (elev. 322.4m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

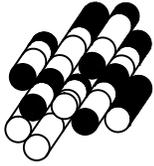
## LOG OF BOREHOLE ..4..

PROJECT No.: 31-12-8015  
 BORING DATE: March 21, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		325.8											
	100mm - TOPSOIL		0.0											
	Red Stiff to Hard Moist			1	SS	8	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	28		x						
				3	SS	26		x						
2				4	SS	50/100mm								
3				5	SS	50/25mm								
	Red Hard Moist		322.6 3.2											
4	SHALE, with limey inter beds, weathered, thinly bedded			6	SS	50/100mm								
5				7	SS	50/100mm								
6														
	End of Borehole		319.2 6.6											
7														
8														
9														

Concrete  
Bentonite Seal  
1.4m

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 3m slotted screen tip at 6.2m.
- Water level on March 29, 2012 measured at 1.4m (elev. 324.4m).



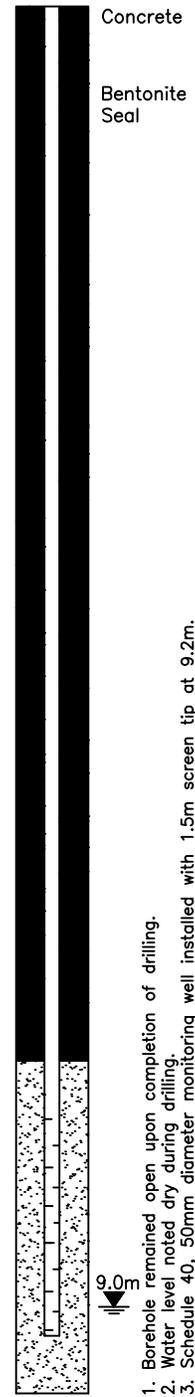
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

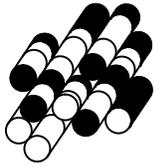
## LOG OF BOREHOLE ..5A..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES		PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		326.3											
	150mm - TOPSOIL		0.0											
	Red Stiff to Hard Moist			1	SS	6	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	24		x						
2				3	SS	31		x						
3				4	SS	46		x						
4				5	SS	50	150mm							
4	Red Hard Moist		322.8											
5	SHALE, with limy inter beds, weathered, thinly bedded, with grey layers, difficult augering below 8.5m		3.5											
6				6	SS	50	125mm							
7				7	SS	50	100mm							
8				8	SS	50	25mm							
9			316.7											
	End of Borehole		9.6											



- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 9.2m.
- Water level on March 29, 2012 measured at 9.0m (elev. 317.3m).



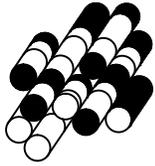
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..5B..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\times \times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80	20	40	60	
0	GROUND SURFACE		326.3											
	See Borehole Log 5A for strata description.		0.0											
6	End of Borehole		320.2											
7			6.1											<ol style="list-style-type: none"> <li>Borehole remained open upon completion of drilling.</li> <li>Water level noted dry during drilling.</li> <li>Schedule 40, 50mm diameter monitoring well installed with 3m screen tip at 6.0m.</li> <li>Water level on March 29, 2012 measured at 2.0m (elev. 324.3m).</li> </ol>



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

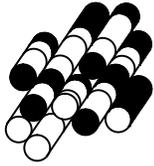
## LOG OF BOREHOLE ..6..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		329.5											
	75mm - TOPSOIL Red/Grey	Stiff to Hard Moist	0.0	1	SS	4 x								
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey seams/inclusions			2	SS	19	x							
2				3	SS	40	x							
				4	SS	50/125mm								
3	Red	Hard	Moist	5	SS	50/150mm								
4	SHALE, with limey inter beds, weathered, thinly bedded, difficult augering below 5.5m			6	SS	50/90mm								
5				7	SS	50/75mm								
6				End of Borehole		6.6								
7														
8														
9														

Concrete  
Bentonite Seal  
3.2m

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 3m slotted screen tip at 6.0m.
- Water level on March 29, 2012 measured at 3.2m (elev. 326.3m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

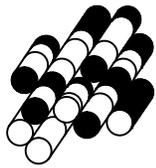
# LOG OF BOREHOLE ..7..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		333.0											
	200mm - TOPSOIL Red	Moist	0.0	1	SS	5	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with brown sandy silt seams			2	SS	21	x							
2				3	SS	23	x							
3				4	SS	30	x							
4				5	SS	33	x							
4	Red	Hard	328.9											
5	SHALE, with limey inter beds, weathered, thinly bedded	Moist	4.1	6	SS	50/75mm								
6				7	SS	50/150mm								
6			326.4											
7	End of Borehole		6.6											



1. Borehole remained open upon completion of drilling.
2. Water level noted dry during drilling.
3. 75mm standpipe installed with 1.5m slotted screen tip at 6.1m.
4. Water level on March 29, 2012 measured at 1.8m (elev. 331.2m).



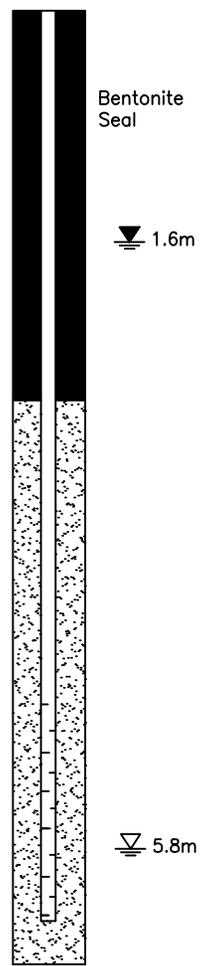
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

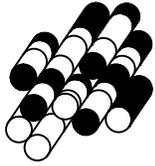
## LOG OF BOREHOLE ..8..

PROJECT No.: 31-12-8015  
 BORING DATE: March 21, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WP			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		331.4											
	Red Stiff to Hard Moist		0.0	1	SS	11	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth			2	SS	21	x							
				3	SS	19	x							
2				4	SS	39		x						
3				5	SS	26	x							
4														
5	Red Hard Moist		326.6	6	SS	80				x				
6	SHALE, with limey inter beds, weathered, thinly bedded		4.8											
				7	SS	50/75mm								
			324.8											
7	End of Borehole		6.6											
8														
9														



- Borehole remained open upon completion of drilling.
- Water level noted at 5.8m during drilling.
- 75mm standpipe installed with 1.5m slotted screen tip at 6.3m.
- Water level on March 29, 2012 measured at 1.6m (elev. 329.8m).



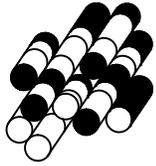
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..9..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION		
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa									
							20	40	60	80						
0	GROUND SURFACE		331.7													
0	100mm - TOPSOIL Red Stiff to Hard Moist		0.0	1	SS	9	x									
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth			2	SS	20	x									
2				3	SS	30		x								
3				4	SS	22		x								
4				5	SS	41				x						
5				6	SS	50/125mm										
5	Red Hard Moist		326.4													
5.3			5.3													
6	SHALE, with limey inter beds, weathered, thinly bedded			7	SS	50/50mm										
6			325.1													
6.6	End of Borehole		6.6													
7														<ol style="list-style-type: none"> <li>Borehole remained open upon completion of drilling.</li> <li>Water level noted dry during drilling.</li> <li>Schedule 40, 50mm diameter monitoring well installed with 3m slotted screen tip at 6.0m.</li> <li>Water level on March 29, 2012 measured at 0.1m above grade (elev. 331.8m).</li> </ol>		
8																
9																



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

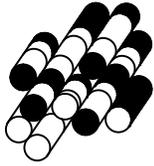
## LOG OF BOREHOLE ..10A..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD	DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)				
								20	40	60	80					
								nat.V - +      Q - ● rem.V - ⊕      U - ○								
D-50T Crawler-mounted Drill Rig / Solid Stem Augers	0	GROUND SURFACE		339.0												
		Red Stiff to Hard Moist		0.0	1	SS	8	x								
		SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, trace to some gravel				2	SS	26	x							
				337.2												
		Grey Dense Wet		1.8	3	SS	41	x								
		GRAVEL & SAND, trace to some silt		336.9												
		Red Hard Moist		2.1	4	SS	62	x								
		SHALE, with limy inter beds, weathered, thinly bedded, with grey layers				5	SS	35	x							
						6	SS	50/75mm								
						7	SS	50/50mm								
					8	SS	50/50mm									
					9	SS	50/25mm									
		End of Borehole		329.4												
				9.6												



- Borehole remained open upon completion of drilling.
- Water level noted at 1.8m during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 9.2m.
- Water level on March 29, 2012 measured at 2.2m (elev. 336.8m).



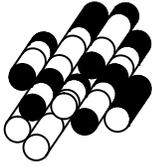
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..10B..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\times \times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80	20	40	60	
0	GROUND SURFACE		339.0											<p>Concrete Bentonite Seal ▽ 0.7m Well Sand ▽ 1.8m</p>
	See Borehole Log 10A for strata description.		0.0											
3.3	End of Borehole		335.7											<ol style="list-style-type: none"> <li>Borehole remained open upon completion of drilling.</li> <li>Water level noted at 1.8m during drilling.</li> <li>Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 3.3m.</li> <li>Water level on March 29, 2012 measured at 0.7m (elev. 338.3m).</li> </ol>
3.3			3.3											
4														
5														
6														
7														
8														
9														



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..11..

PROJECT No.: 31-12-8015  
 BORING DATE: March 22, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\times \times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		340.5											
	Red Stiff to Hard Moist		0.0	1	SS	9	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with brown sandy silt seams			2	SS	35		x						
2				3	SS	50/125mm								
3			337.8	4	SS	74			x					
	Red Hard Moist		2.7											
4	SHALE, with limy inter beds, weathered, thinly bedded			5	SS	50/150mm								
5				6	SS	50/75mm								
6				7	SS	50/75mm								
			333.9											
7	End of Borehole		6.6											
8														
9														

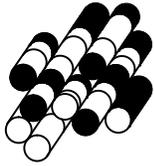
D-50T Crawler-mounted Drill Rig / Solid Stem Augers

Bentonite Seal

▽ 4.1m

▽ 5.6m

1. Borehole remained open upon completion of drilling.
2. Water level noted at 5.6m during drilling.
3. 75mm standpipe installed with 1.5m slotted screen tip at 6.4m.
4. Water level on March 29, 2012 measured at 4.1m (elev. 336.4m).



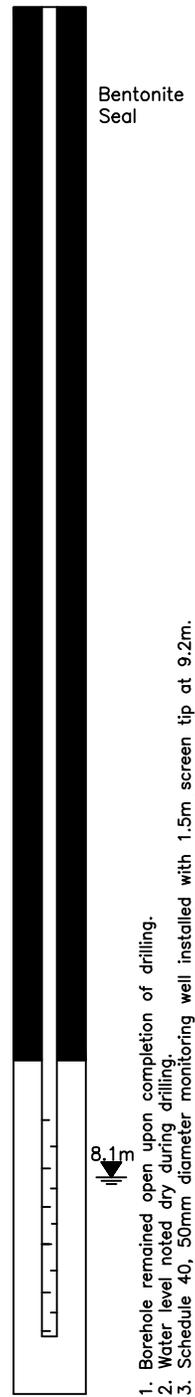
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

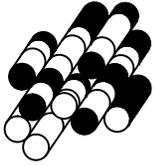
## LOG OF BOREHOLE ..12A..

PROJECT No.: 31-12-8015  
 BORING DATE: March 23, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD	DEPTH SCALE IN METRES	SOIL PROFILE		SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80					
							nat.V - + Q - ● rem.V - ⊕ U - ○								
D-50T Crawler-mounted Drill Rig / Solid Stem Augers	0	GROUND SURFACE		331.3											
		125mm - TOPSOIL		0.0											
		Red Stiff to Hard Moist			1	SS	10	x							
					2	SS	28		x						
		SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey layers			3	SS	43			x					
					4	SS	73				x				
					5	SS	33		x						
					6	SS	50/100mm								
					7	SS	50/75mm								
					8	SS	50/50mm								
	4	Red Hard Moist		327.3											
	4.0			4.0											
	5	SHALE, with limey inter beds, weathered, thinly bedded, with grey layers at about 7.5 to 8.0m depth			6	SS	50/100mm								
					7	SS	50/75mm								
					8	SS	50/50mm								
					9	SS	50/150mm								
	9.6	End of Borehole		321.7											



1. Borehole remained open upon completion of drilling.
2. Water level noted dry during drilling.
3. Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 9.2m.
4. Water level on March 29, 2012 measured at 8.1m (elev. 323.2m).



# Terraprobe

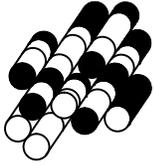
PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..12B..

PROJECT No.: 31-12-8015  
 BORING DATE: March 23, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES		PENETRATION RESISTANCE PLOT $\times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH kPa							
						20	40	60	80	nat.V - +	Q - ●	rem.V - ⊕	
0	GROUND SURFACE		331.3										<p>Concrete Bentonite Seal Well Sand 2.0m</p>
	See Borehole Log 12A for strata description.		0.0										
3	End of Borehole		328.2										
3.1			3.1										<ol style="list-style-type: none"> <li>Borehole remained open upon completion of drilling.</li> <li>Water level noted dry during drilling.</li> <li>Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 3.1m.</li> <li>Water level on March 29, 2012 measured at 2.0m (elev. 329.3m).</li> </ol>

D-50T Crawler-mounted Drill Rig / Solid Stem Augers



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

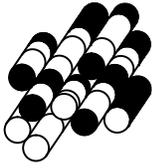
## LOG OF BOREHOLE ..13..

PROJECT No.: 31-12-8015  
 BORING DATE: March 23, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES		PENETRATION RESISTANCE PLOT $\times \times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80				
0	GROUND SURFACE		333.4											
	150mm - TOPSOIL Red Stiff to Hard Moist		0.0	1	SS	10	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth			2	SS	22	x							
2				3	SS	34	x							
3	Red Hard Moist		330.5 2.9	4	SS	53		x						
4	SHALE, with limy inter beds, weathered, thinly bedded, with grey layers			5	SS	50/150mm								
5				6	SS	50/100mm								
6				7	SS	50/75mm								
7	End of Borehole		326.8 6.6											
8														
9														

Concrete  
Bentonite Seal  
2.9m

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 3m screen tip at 6.2m.
- Water level on March 29, 2012 measured at 2.9m (elev. 330.5m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..14..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80	20	40	60	
0	GROUND SURFACE		341.8											
	250mm - TOPSOIL Red/Grey	Stiff to Hard Moist to Wet	0.0	1	SS	9	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with wet seam at 2m depth			2	SS	21	x							
					3	SS	35		x					
2					4	SS	54			x				
3					5	SS	55				x			
4					337.7									
	Grey	Hard	4.1											
5	SHALE, with limestone inter beds, 15mm thick layer of gypsum-like crystalline structure at 6.2m			6	SS	50/75mm								
6														
					335.2									
			6.6	7	SS	50/50mm								
	End of Borehole													
7														
8														
9														

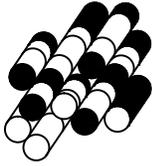
Bentonite Seal

Auger cuttings

2.2m

Bentonite Seal

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- 75mm standpipe installed with 1.5m slotted screen tip at 6.1m.
- Water level on March 29, 2012 measured at 2.2m (elev. 339.6m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

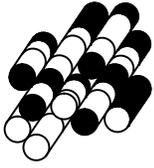
## LOG OF BOREHOLE ..15..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\begin{matrix} x \\ x \\ x \end{matrix}$				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa							
							20	40	60	80	nat.V - +	rem.V - ⊕	U - ○	
0	GROUND SURFACE		344.1											
	125mm - TOPSOIL Red to Grey	Stiff to Hard Moist	0.0	1	SS	9	x						○	
1	SILT, some clay to clayey, trace sand, trace to some gravel, grading into shale at depth, with occasional cobbles			2	SS	22	x						○	
2				3	SS	65		x					○	
	Grey to Red	Hard Moist	342.0											
			2.1	4	SS	50/100mm							○	
3	SHALE, with limey inter beds, weathered, thinly bedded, with wet seam at 5m depth			5	SS	50/150mm							○	
4														
5				6	SS	50/50mm							○	
6														
			337.5	7	SS	50/75mm							○	
	End of Borehole		6.6											
7														
8														
9														

Bentonite Seal  
Auger cuttings  
Bentonite Seal  
2.9m

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- 75mm standpipe installed with 3m slotted screen tip at 6.2m.
- Water level on March 29, 2012 measured at 2.9m (elev. 341.2m).



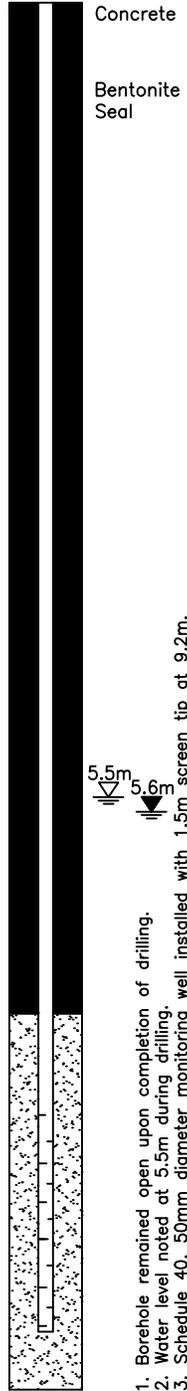
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

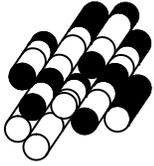
## LOG OF BOREHOLE ..16A..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		324.1											
	75mm - TOPSOIL		0.0											
	Red Stiff to Hard Moist			1	SS	8	x							
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth, with grey layers			2	SS	18	x							
				3	SS	26	x							
2				4	SS	44		x						
3				5	SS	48			x					
4				319.9										
	Red Hard Moist		4.2											
5	SHALE, with limey inter beds, weathered, thinly bedded			6	SS	71			x					
6				7	SS	50/125mm								
7				8	SS	50/125mm								
8				314.5										
	End of Borehole		9.6											



- Borehole remained open upon completion of drilling.
- Water level noted at 5.5m during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 9.2m.
- Water level on March 29, 2012 measured at 5.6m (elev. 318.5m).



# Terraprobe

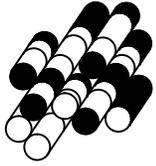
PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..16B..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		324.1											<p>Concrete Bentonite Seal Well Sand 2.7m</p>
	See Borehole Log 16A for strata description.		0.0											
3	End of Borehole		321.0											
3.1			3.1											
4														
5														
6														
7														
8														
9														

1. Borehole remained open upon completion of drilling.
2. Water level noted dry during drilling.
3. Schedule 40, 50mm diameter monitoring well installed with 1.5m screen tip at 3.1m.
4. Water level on March 29, 2012 measured at 2.7m (elev. 321.4m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..17..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\times \times \times$				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa								
							20	40	60	80					
							nat.V - +      Q - ● rem.V - ⊕      U - ○								
							20	40	60	80					
D-50T Crawler-mounted Drill Rig / Solid Stem Augers	0	GROUND SURFACE		341.6											
		100mm - TOPSOIL Red	Stiff to Hard Moist	0.0	1	SS	7	x							
		1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth			2	SS	20	x						
		2				3	SS	35	x						
					339.4										
		Grey/Red	Hard Moist to Wet	2.2	4	SS	50/150mm								
	3	SHALE, with limey inter beds, weathered, thinly bedded, with wet seam at 2.2m and below 6m			5	SS	50/150mm								
	4														
	5				6	SS	50/125mm								
	6														
	7			335.0	7	SS	50/75mm								
		End of Borehole		6.6											
	7														
	8														
	9														

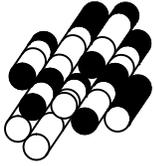
Auger cuttings

Bentonite Seal

3.1m

3.3m

- Borehole remained open upon completion of drilling.
- Water level noted at 3.3m during drilling.
- 75mm standpipe installed with 1.5m slotted screen tip at 6.2m.
- Water level on March 29, 2012 measured at 3.1m (elev. 338.5m).



# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

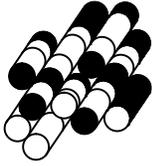
## LOG OF BOREHOLE ..18..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)			
							20	40	60	80	10	20	30	
0	GROUND SURFACE		353.6											
0	150mm - TOPSOIL Red Stiff to Hard Moist		0.0	1	SS	8	x							
1	CLAY & SILT, to CLAYEY SILT, trace sand, trace gravel, grading into shale at depth			2	SS	32		x						
2	Red Hard Moist		351.6	3	SS	42			x					
2			2.0	4	SS	65				x				
3	SHALE, with limy inter beds, weathered, thinly bedded, with grey layer at 5m depth			5	SS	50/150mm								
5				6	SS	50/100mm								
6				7	SS	50/100mm								
6.6	End of Borehole		347.0											
6.6			6.6											

Concrete  
Bentonite Seal  
4.0m

- Borehole remained open upon completion of drilling.
- Water level noted dry during drilling.
- Schedule 40, 50mm diameter monitoring well installed with 3m screen tip at 5.8m.
- Water level on March 29, 2012 measured at 4.0m (elev. 349.6m).



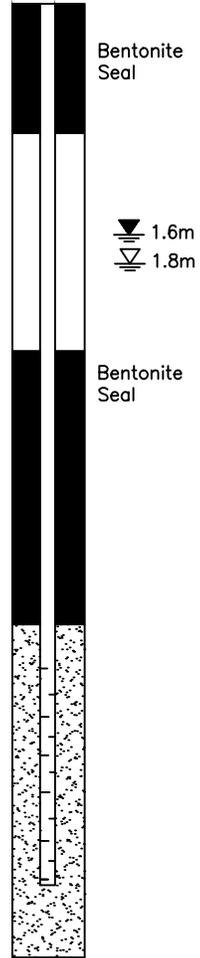
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

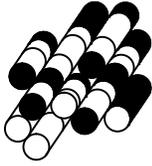
## LOG OF BOREHOLE ..19..

PROJECT No.: 31-12-8015  
 BORING DATE: March 26, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa				WATER CONTENT (%)				
							20	40	60	80	10	20	30		
0	GROUND SURFACE		347.0												
0.0	100mm - TOPSOIL Red	Moist	0.0	1	SS	10	x								
1	CLAY & SILT, to CLAYEY SILT, trace sand, trace to some gravel, grading into shale at depth, with occasional cobbles			2	SS	27	x								
				3	SS	30	x								
2															
2.2	Red/Grey	Hard	344.8	4	SS	50/150mm									
3	SHALE, with limy inter beds, weathered, thinly bedded, with wet seam at 3.6m depth	Moist to Wet		5	SS	50/125mm									
4															
5															
6															
6.1			340.4	7	SS	50/75mm									
6.6	End of Borehole		6.6												
7															
8															
9															



- Borehole remained open upon completion of drilling.
- Water level noted at 1.8m during drilling.
- 75mm standpipe installed with 1.5m slotted screen tip at 6.1m.
- Water level on March 29, 2012 measured at 1.6m (elev. 345.4m).



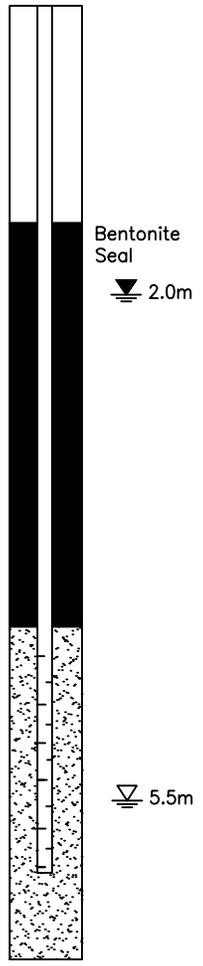
# Terraprobe

PROJECT NAME: Meaford Subdivision  
 CLIENT: Meaford A2A Developments Inc.  
 LOCATION: Meaford, Ontario

## LOG OF BOREHOLE ..20..

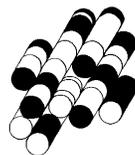
PROJECT No.: 31-12-8015  
 BORING DATE: March 23, 2012  
 ELEVATION DATUM: Geodetic

BORING METHOD DEPTH SCALE IN METRES	SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT $\begin{matrix} x \\ x \\ x \end{matrix}$				WATER CONTENT (%)			INSTALLATION INFORMATION	
	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	"N" VALUE	SHEAR STRENGTH kPa								
							20	40	60	80					
0	GROUND SURFACE		341.2												
	150mm - TOPSOIL Red	Stiff to Hard Moist	0.0	1	SS	10	x								
1	SILT, some clay to clayey, trace sand, trace gravel, grading into shale at depth			2	SS	39		x							
					3	SS	37		x						
						4	SS	23		x					
						5	SS	24		x					
4			Red	Hard	Moist										
	SHALE, with limey inter beds, weathered, thinly bedded		337.2	6	SS	50/150mm									
						7	SS	50/50mm							
6			334.6												
7	End of Borehole		6.6												
8															
9															



- Borehole remained open upon completion of drilling.
- Water level noted at 5.5m during drilling.
- 75mm standpipe installed with 1.5m slotted screen tip at 6.0m.
- Water level on March 29, 2012 measured at 2.0m (elev. 339.2m).

# GRAIN SIZE ANALYSIS



**Terraprobe Inc.**



**Terraprobe**

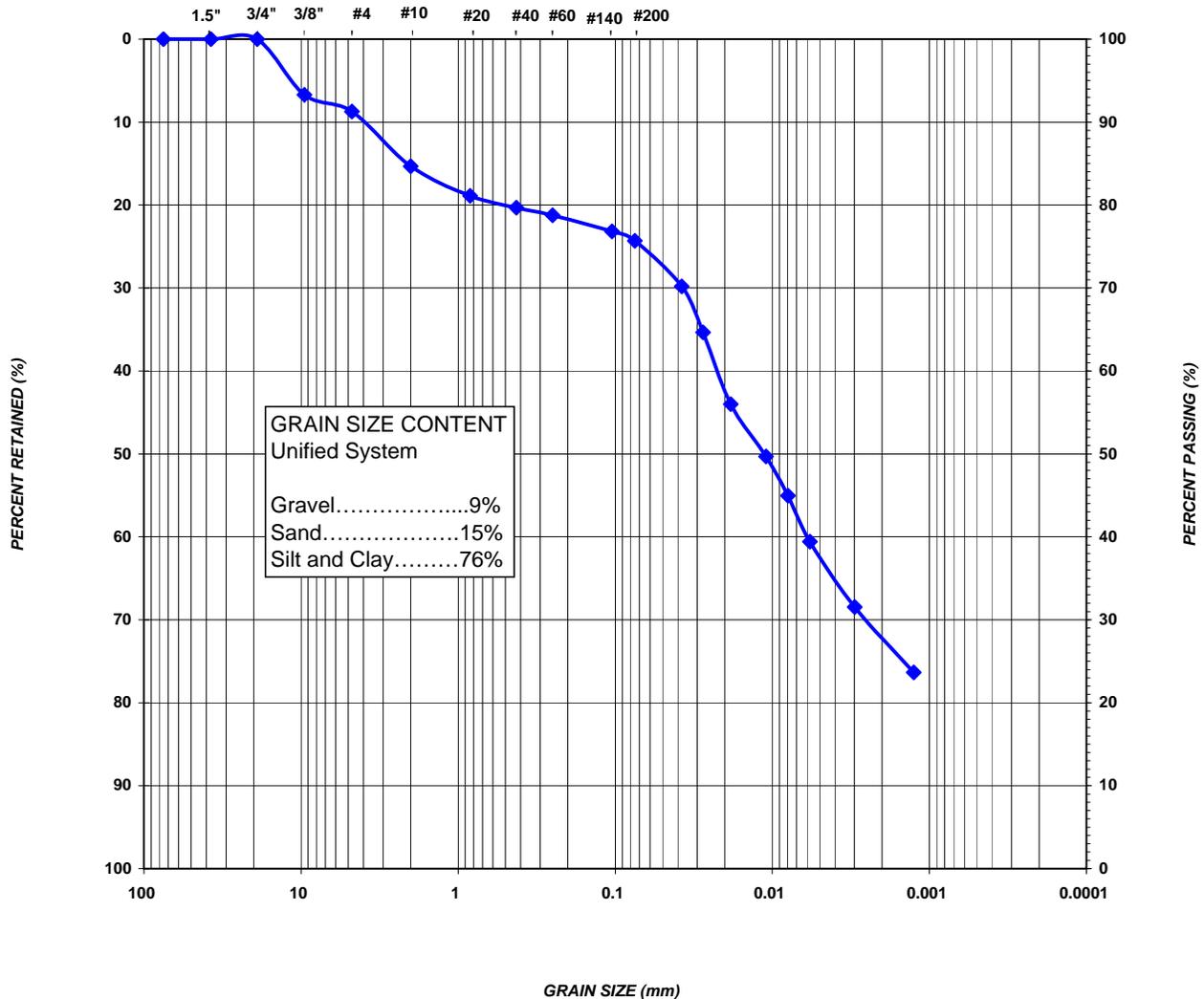
**SIEVE AND HYDROMETER ANALYSIS  
TEST REPORT**

PROJECT: **Meaford Subdivision**  
LOCATION: **Meaford, ON**  
CLIENT: **Meaford A2A Developments Inc.**  
**c/o Friedman & Associates**  
BOREHOLE NUMBER: **1** SAMPLE DEPTH: **N/G**  
SAMPLE NUMBER: **2**  
SAMPLE LOCATION: **as above**  
SAMPLE DESCRIPTION: **Silt, some clay, some sand, trace gravel**

FILE NO.: **31-12-8015**  
LAB NO.: **1514a**  
SAMPLE DATE: **Apr-03-12**  
SAMPLED BY: **B.H.**

**GRAIN SIZE DISTRIBUTION**

*U.S. STANDARD SIEVE SIZES*



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
	SAND						
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				



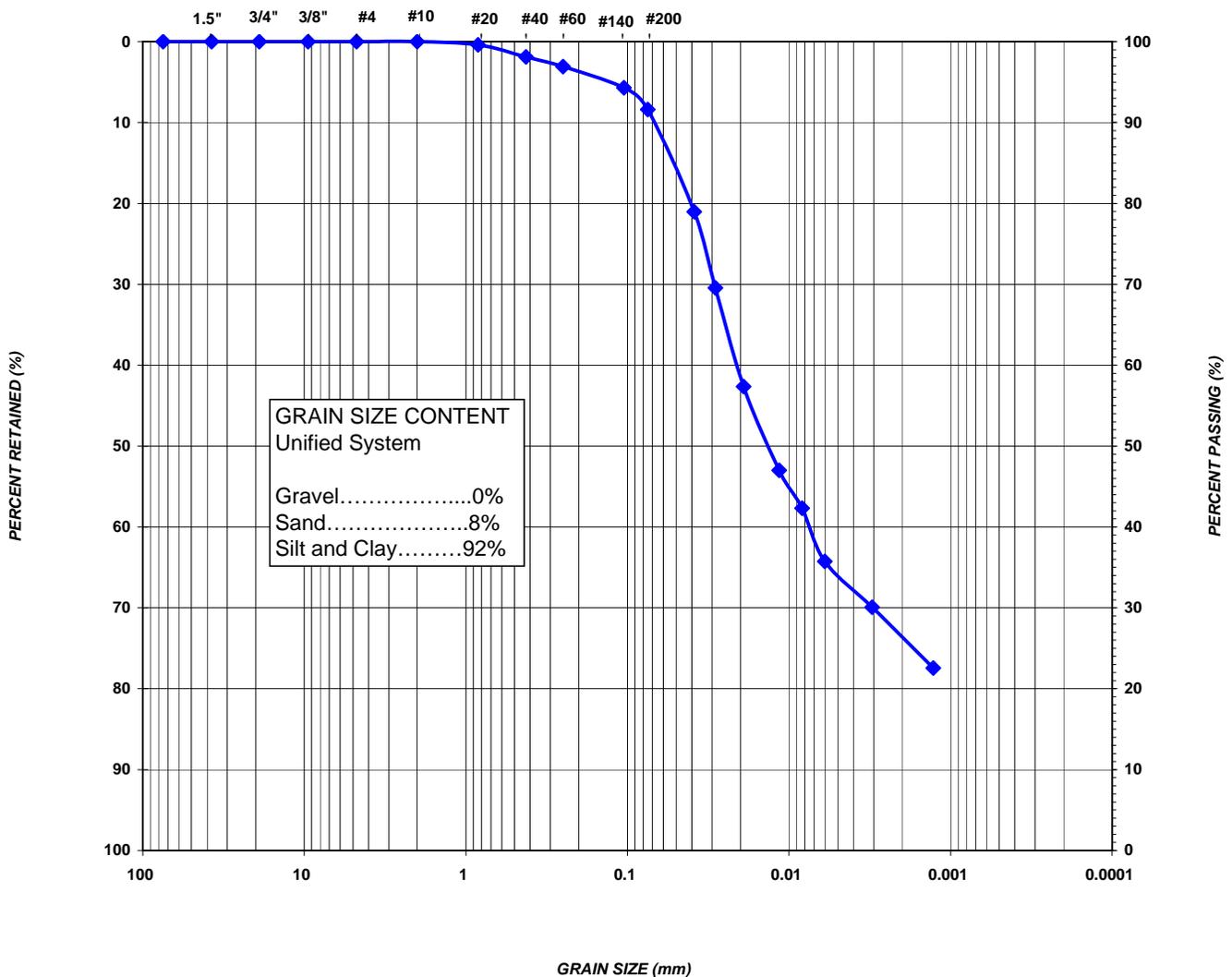
PROJECT: Meaford Subdivision  
 LOCATION: Meaford, ON  
 CLIENT: Meaford A2A Developments Inc.  
 c/o Friedman & Associates

FILE NO.: 31-12-8015  
 LAB NO.: 1514b  
 SAMPLE DATE: Apr-03-12  
 SAMPLED BY: B.H.

BOREHOLE NUMBER: 6      SAMPLE DEPTH: N/G  
 SAMPLE NUMBER: 4  
 SAMPLE LOCATION: as above  
 SAMPLE DESCRIPTION: Clayey silt, trace sand

### GRAIN SIZE DISTRIBUTION

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
	SAND						
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				



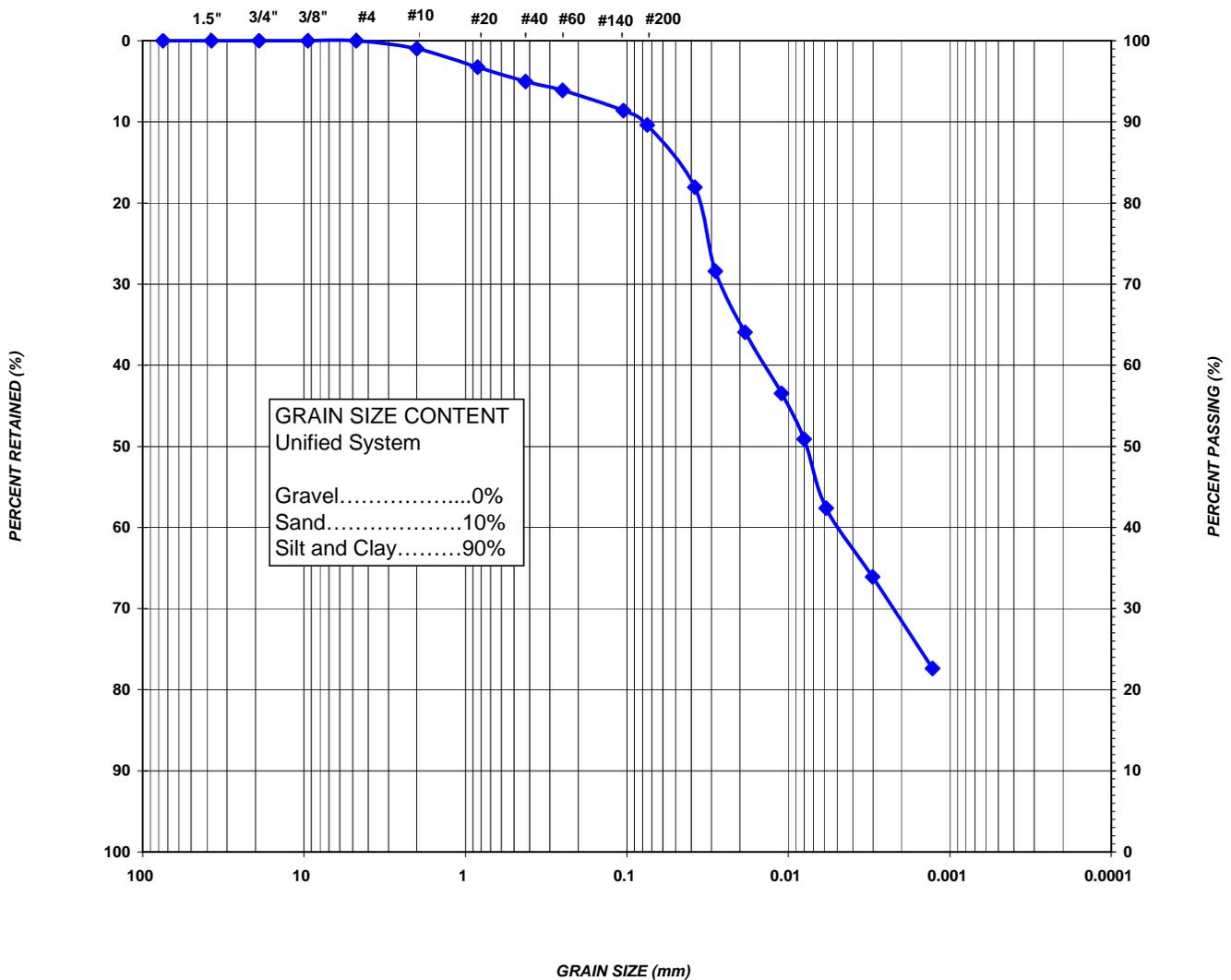
PROJECT: **Meaford Subdivision**  
 LOCATION: **Meaford, ON**  
 CLIENT: **Meaford A2A Developments Inc.**  
**c/o Friedman & Associates**

FILE NO.: **31-12-8015**  
 LAB NO.: **1514c**  
 SAMPLE DATE: **Apr-03-12**  
 SAMPLED BY: **B.H.**

BOREHOLE NUMBER: **16**      SAMPLE DEPTH: **N/G**  
 SAMPLE NUMBER: **7**  
 SAMPLE LOCATION: **as above**  
 SAMPLE DESCRIPTION: **Clayey silt, trace sand**

**GRAIN SIZE DISTRIBUTION**

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
	SAND						
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				



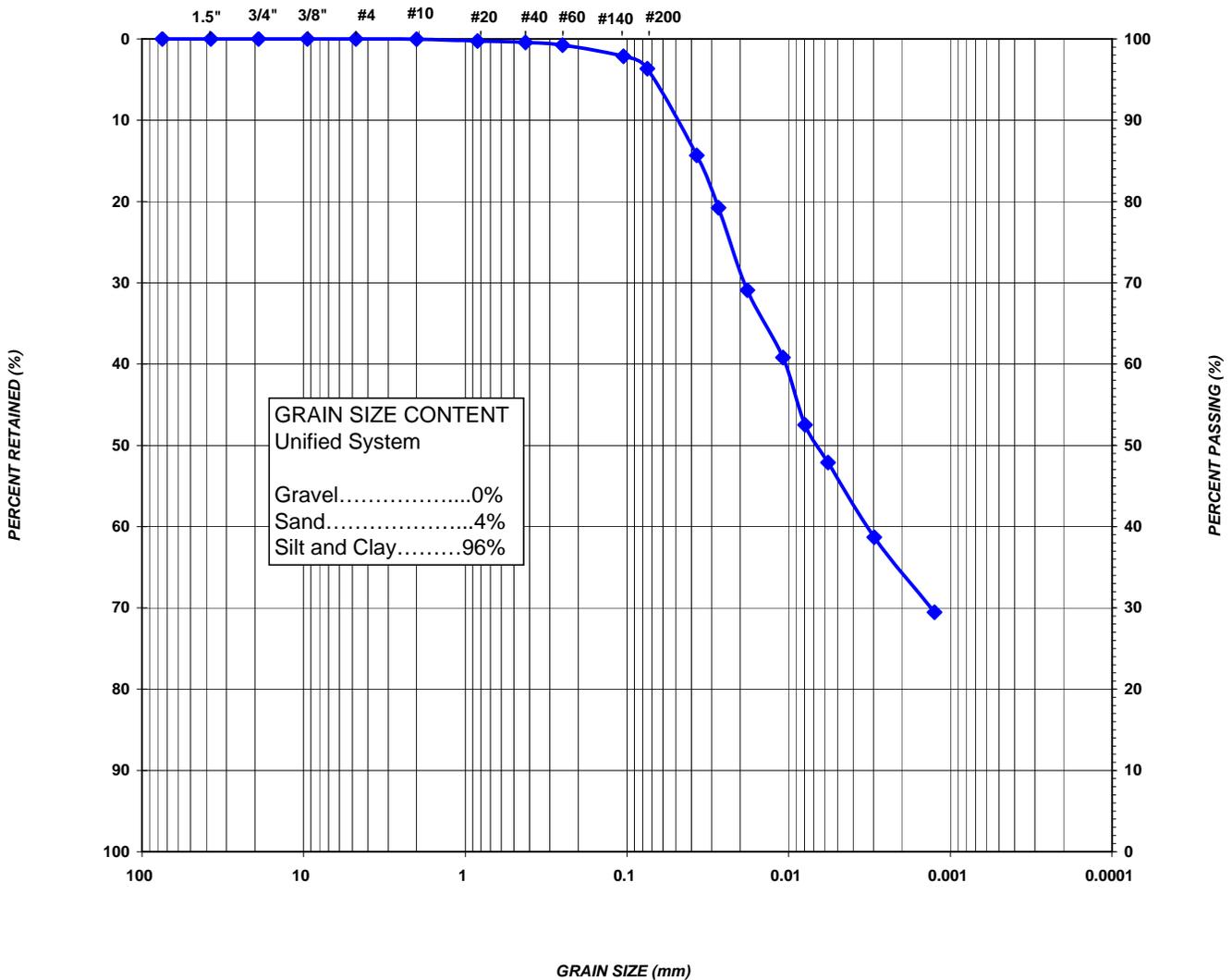
PROJECT: **Meaford Subdivision**  
 LOCATION: **Meaford, ON**  
 CLIENT: **Meaford A2A Developments Inc.**  
**c/o Friedman & Associates**

FILE NO.: **31-12-8015**  
 LAB NO.: **1514d**  
 SAMPLE DATE: **Apr-03-12**  
 SAMPLED BY: **B.H.**

BOREHOLE NUMBER: **5** SAMPLE DEPTH: **N/G**  
 SAMPLE NUMBER: **3**  
 SAMPLE LOCATION: **as above**  
 SAMPLE DESCRIPTION: **Clayey silt, trace sand**

**GRAIN SIZE DISTRIBUTION**

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
			SAND				
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				



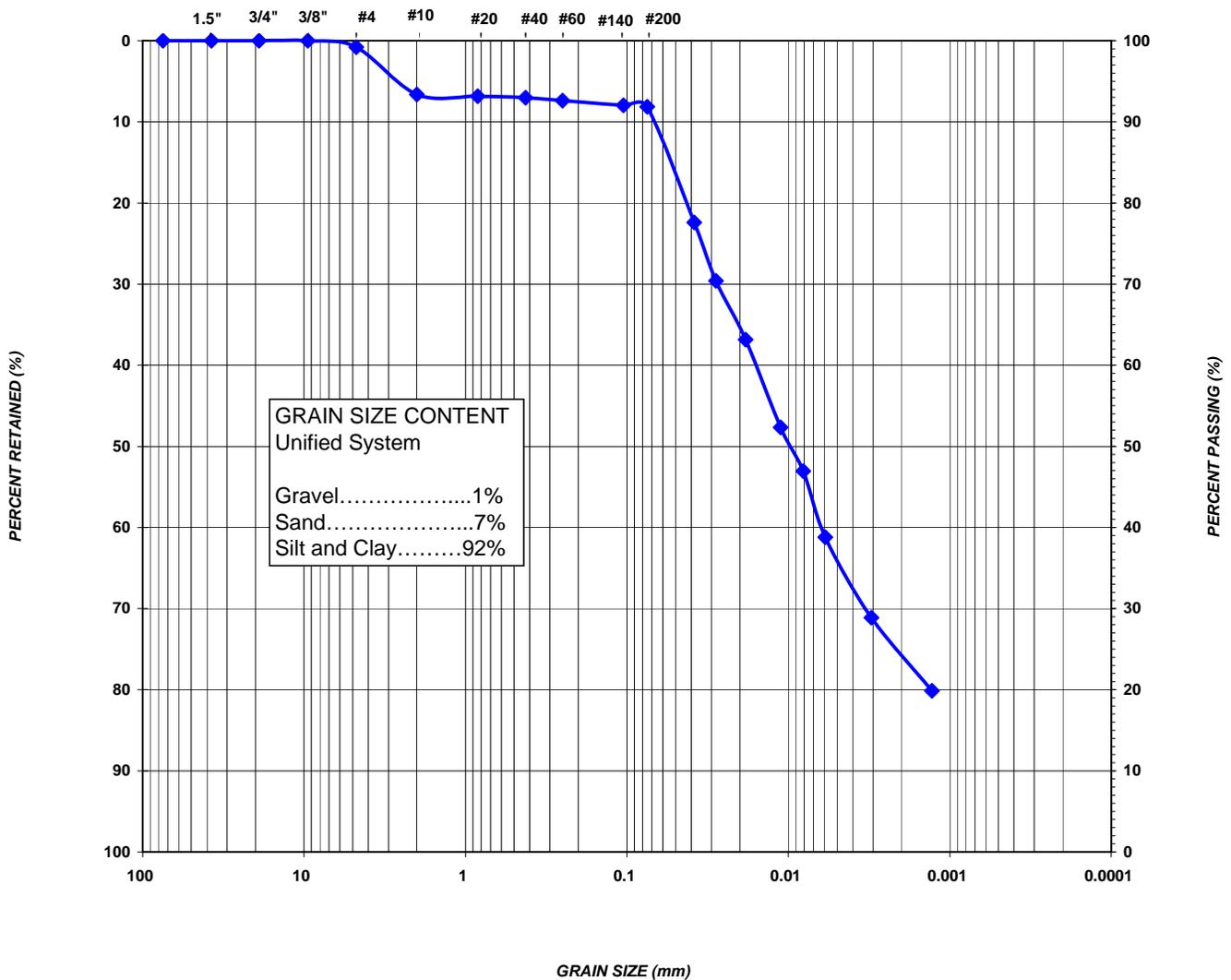
PROJECT: **Meaford Subdivision**  
 LOCATION: **Meaford, ON**  
 CLIENT: **Meaford A2A Developments Inc.**  
**c/o Friedman & Associates**

FILE NO.: **31-12-8015**  
 LAB NO.: **1514e**  
 SAMPLE DATE: **Apr-03-12**  
 SAMPLED BY: **B.H.**

BOREHOLE NUMBER: **12**      SAMPLE DEPTH: **N/G**  
 SAMPLE NUMBER: **7**  
 SAMPLE LOCATION: **as above**  
 SAMPLE DESCRIPTION: **Silt, some clay, trace sand, trace gravel**

**GRAIN SIZE DISTRIBUTION**

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
				SAND			
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				



**Terraprobe**

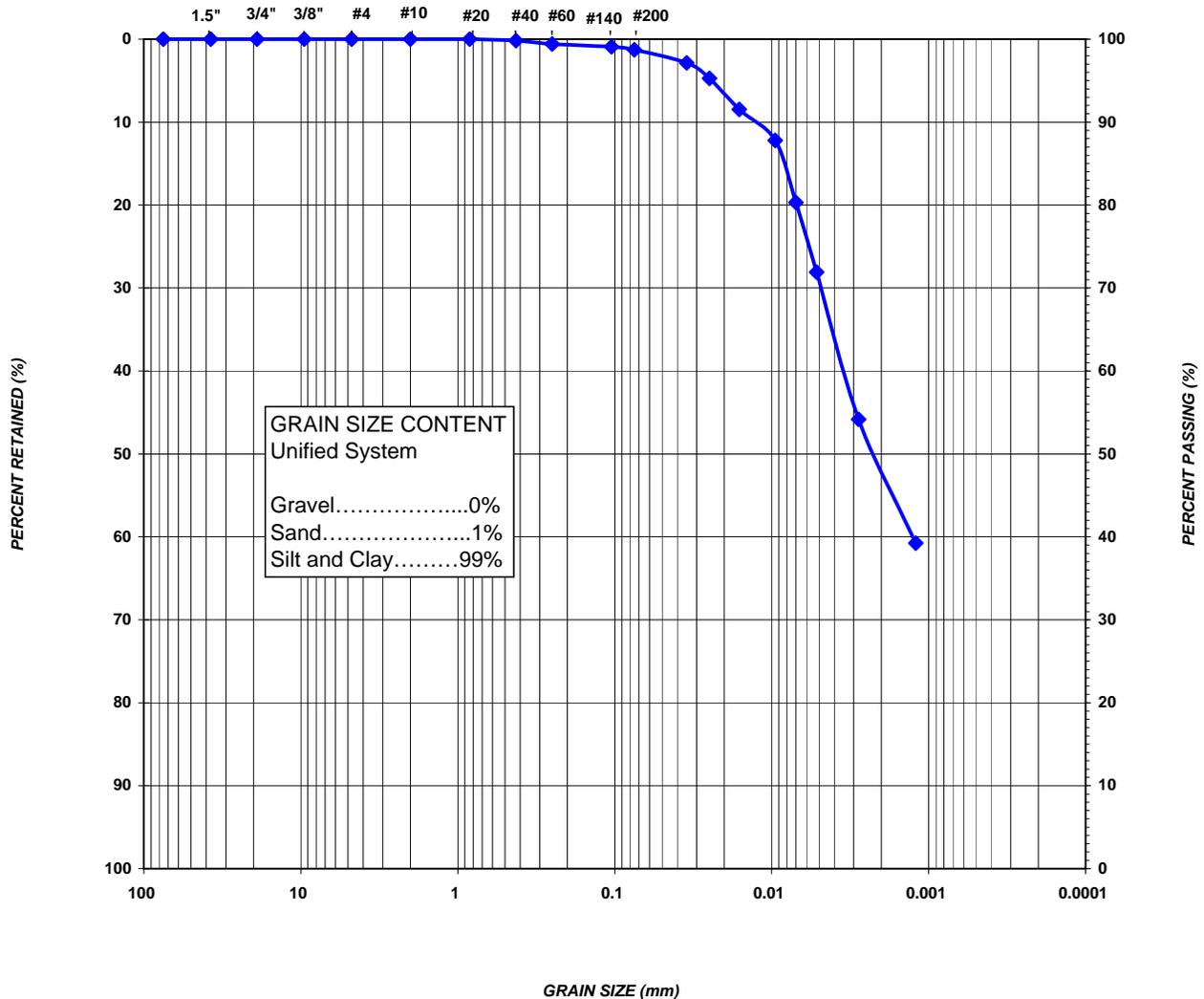
**SIEVE AND HYDROMETER ANALYSIS  
TEST REPORT**

PROJECT: **Meaford Subdivision**  
LOCATION: **Meaford, ON**  
CLIENT: **Meaford A2A Developments Inc.**  
**c/o Friedman & Associates**  
BOREHOLE NUMBER: **18**      SAMPLE DEPTH: **N/G**  
SAMPLE NUMBER: **3**  
SAMPLE LOCATION: **as above**  
SAMPLE DESCRIPTION: **silt and clay, trace sand**

FILE NO.: **31-12-8015**  
LAB NO.: **1514f**  
SAMPLE DATE: **Apr-03-12**  
SAMPLED BY: **B.H.**

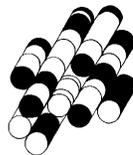
**GRAIN SIZE DISTRIBUTION**

U.S. STANDARD SIEVE SIZES



MIT SYSTEM	GRAVEL		COARSE	MEDIUM	FINE	SILT	CLAY
	SAND						
UNIFIED SYSTEM	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY	
	GRAVEL		SAND				

# **SITE PHOTOGRAPHS**



**Terraprobe Inc.**



MAY 2012

## SITE PHOTOGRAPHS

31-12-8015



MAY 2012

## SITE PHOTOGRAPHS

31-12-8015



MAY 2012

## SITE PHOTOGRAPHS

31-12-8015



MAY 2012

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MAY 2012

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31-12-8015



MAY 2012

## SITE PHOTOGRAPHS

31-12-8015



MAY 2012

## SITE PHOTOGRAPHS

31-12-8015

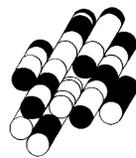


MAY 2012

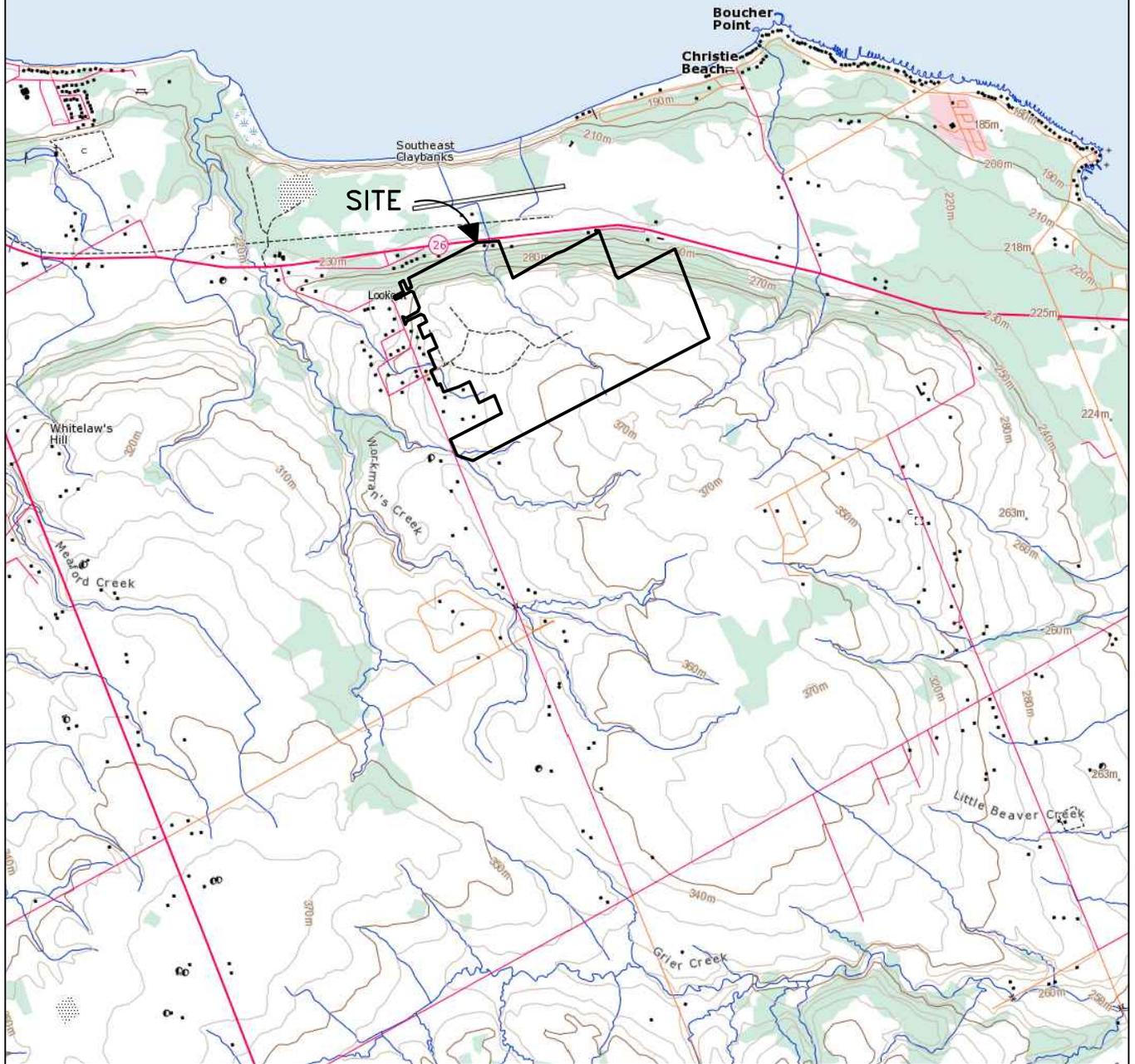
## SITE PHOTOGRAPHS

31-12-8015

# FIGURES



**Terraprobe Inc.**



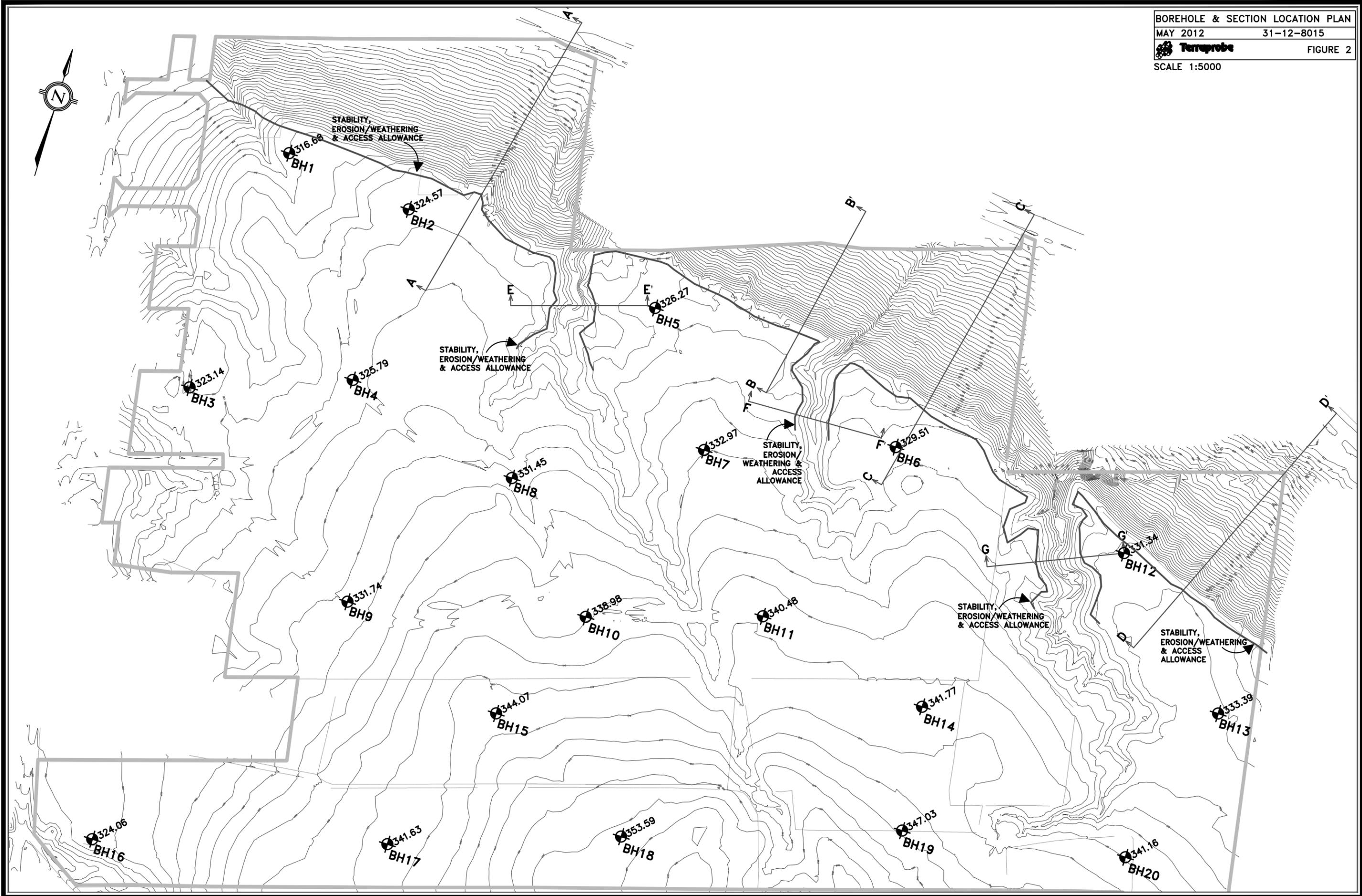
MARCH 2012

# SITE LOCATION PLAN

31-12-8015



FIGURE 1





- NOTES:
1. The concept has not been updated based on geotechnical studies, borehole data or hydrogeological information. To be confirmed by a qualified professional.
  2. The concept is based on a Karst Assessment completed by Karst Solutions.
  3. Concept boundaries and topographic information is based on surveys completed by JD Barnes & Associates.
  4. The concept has not been updated with results of any field work and/or environmental analysis completed by Beacon Environmental in Spring of 2012.
  5. Top-of-bank and other environmental constraints boundaries have not been confirmed.
  6. Environmental Area boundaries are based on Beacon Environmental Preliminary Environmental Constraints Mapping dated November 2010 and include medium and high constraint areas.
  7. Stormwater management pond location and sizing is based on the servicing information prepared by Cole Engineering, dated April 2012.
  8. Proposed water supply and sanitary methods are based on servicing information prepared by Cole Engineering, dated April 2012.
  9. Permits will be obtained for development on lands that fall within the Regulated Areas of GSCA under O.Reg. 151/06. Based on Environmental Impact Study prepared by Beacon Environmental.
  10. Existing Right-of-way width is assumed to be twice the distance from property line to hard surface centerline as shown on the topographic survey.
  11. Areas are approximate between different land uses.

Topo information from survey by J. D. Barnes OLS., dated Nov 4, 2011



**DEVELOPMENT CONCEPT**  
**MEAFORD HIGHLANDS RESORT**  
 LOTS 9 & 10 3RD LINE  
 MEAFORD  
 COUNTY OF GREY



**DEVELOPMENT STATISTICS**

<b>RESORT</b>	
Meaford Highlands Inn and Villas	16.53 ha
Spa / Retail/ Aquatic & Wellness Centre	
Golf Course and Club House	19.37 ha
<b>RESORT RESIDENTIAL</b>	
Low Density Resort Residential	21.57 ha
Resort Residential	24.26 ha
Roads	18.79 ha
Environmental Area	40.42 ha
Open Space / Buffer / Trail	1.76 ha
Park	5.14 ha
Storm Water Management	6.06 ha
<b>TOTAL SITE AREA</b>	<b>153.90 ha</b>
<b>ROAD LENGTH</b>	
26m ROW:	985 m
20m ROW:	3,295 m
18m ROW:	4,560 m
14m ROW:	540 m

**LEGEND**

- Property Boundary
- Meaford Highlands Resort and Villas
- Low Density Resort Residential (21m)
- Low Density Resort Residential (18.3m)
- Resort Residential Single Family (15.2m)
- Resort Residential Single Family (12.2m)
- Resort Residential Semi Detached (9m)
- Resort Residential Townhomes(7m)
- Resort Golf Course
- Environmental - High Constraint Area  
Source: Beacon Environmental, Nov. 2010
- Environmental - Medium Constraint Area  
Source: Beacon Environmental, Nov. 2010
- Park / Parkette
- Trail block / Buffer
- Storm Water Management

**REVISIONS LIST**

2012 APR 11	REVISE NW SWMP, REMOVE CUL-DE-SAC, REMOVE N SWMP.
2012 APR 5	REVISE LOCATION OF AMPHITHEATRE

**WESTON CONSULTING GROUP INC.**

Vaughan Office: 201 Midway Avenue, Unit 19, Vaughan, Ontario L4K 9S8  
 Phone: (905) 738-8080  
 1-800-363-3558 Fax: (905) 738-8637 www.westonconsulting.com

Oakville Office: 1660 North Service Road E., Suite 114, Oakville, Ontario L6H 7C3  
 Phone: (905) 844-8745

File Number: 5305-1  
 Date Drawn: 2012 MAR 27  
 Drawn By: SB  
 Planner: RC  
 Scale: see scale bar  
 CAD: 5305-1/concepts/C10rev for sub Apr 26, 12.dgn

Drawing Number: **C10**

NOT TO SCALE.

MAY 2012

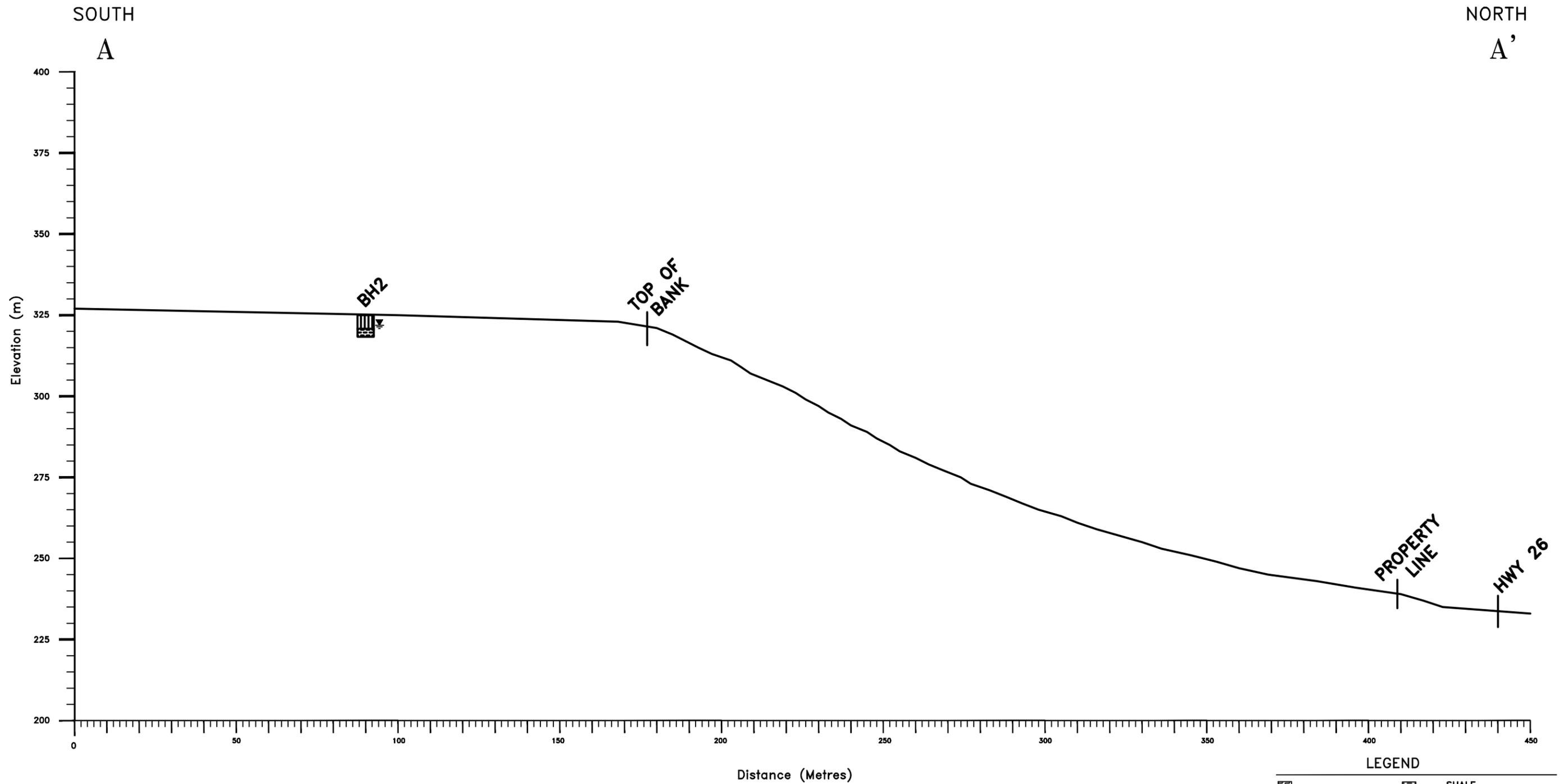
**DEVELOPMENT CONCEPT PLAN**

31-12-8015



**FIGURE 3**

# SECTION A - A'



**SCALES:**  
 Horizontal 1 : 1250  
 Vertical 1 : 1250

LEGEND			
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

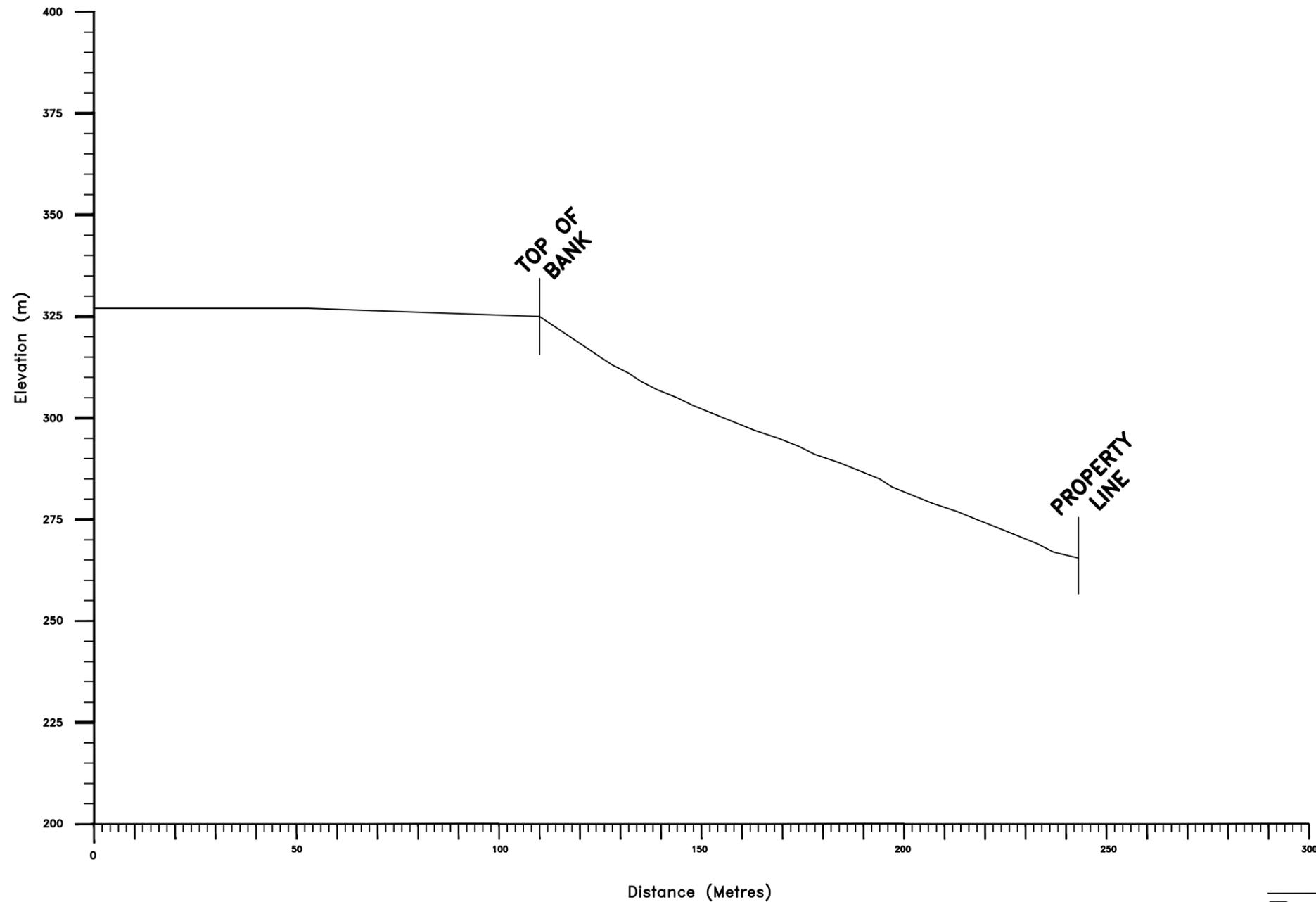
## CROSS SECTION A-A'

31-12-8015

# SECTION B - B'

SOUTH  
B

NORTH  
B'



SCALES:  
Horizontal 1 : 1250  
Vertical 1 : 1250

LEGEND			
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

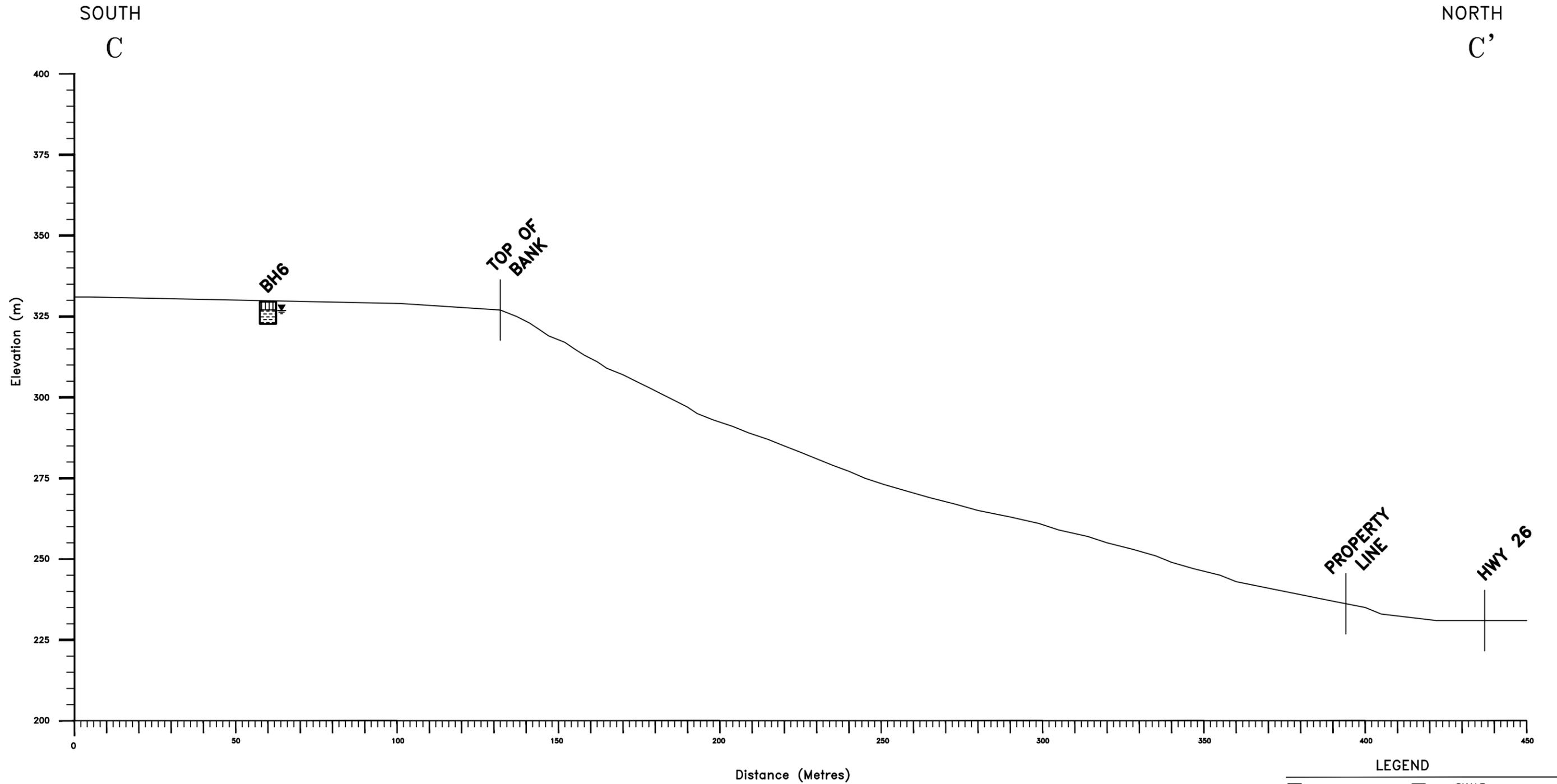
CROSS SECTION B-B'

31-12-8015



FIGURE 5

# SECTION C - C'



SCALES:  
 Horizontal 1 : 1250  
 Vertical 1 : 1250

LEGEND			
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

## CROSS SECTION C-C'

31-12-8015

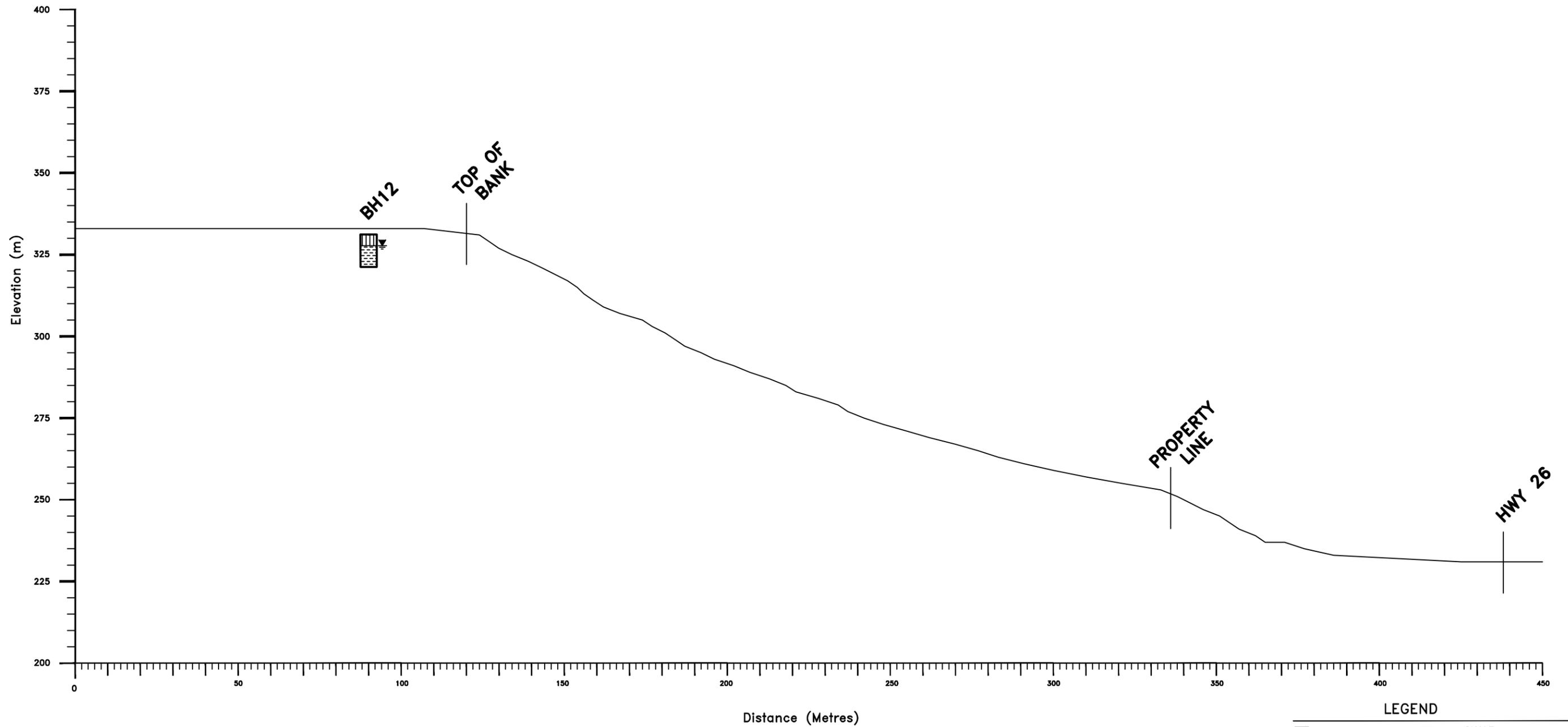


FIGURE 6

# SECTION D - D'

SOUTH  
D

NORTH  
D'



SCALES:  
Horizontal 1 : 1250  
Vertical 1 : 1250

LEGEND			
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

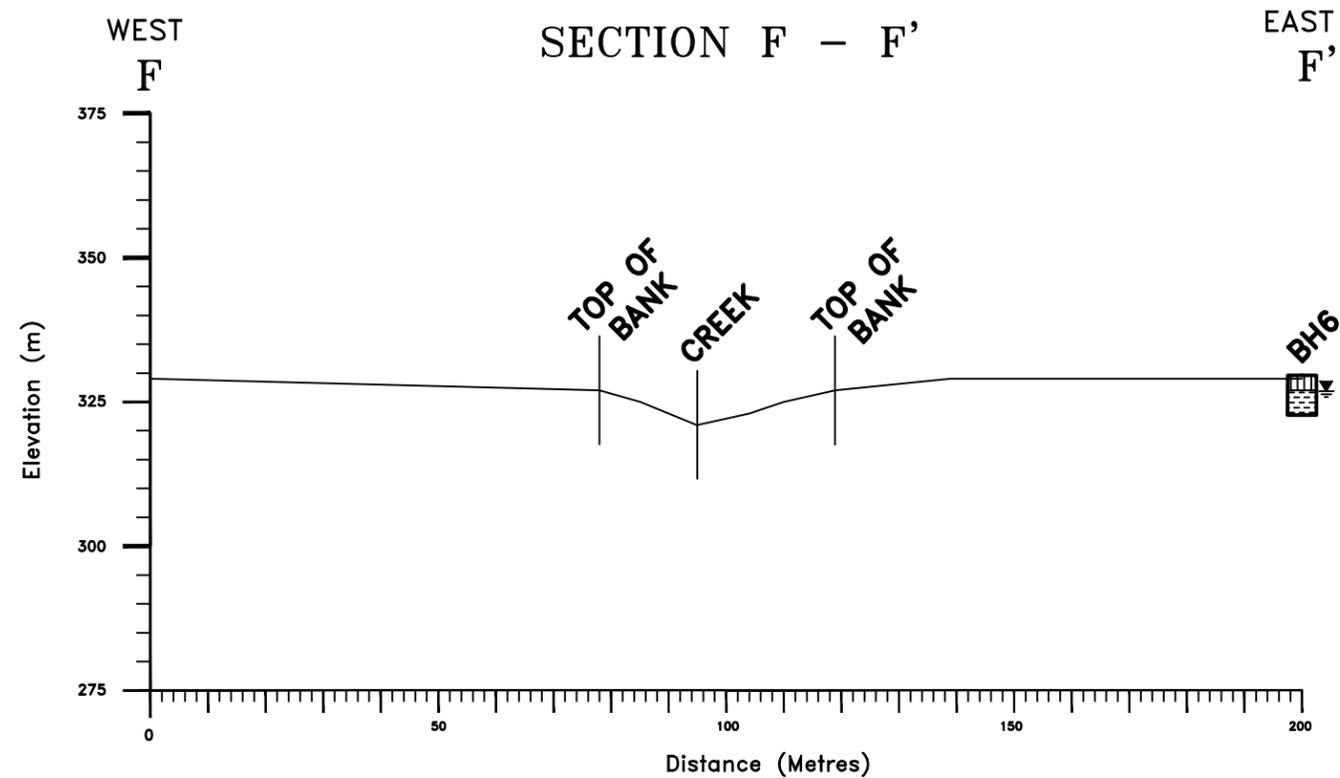
## CROSS SECTION D-D'

31-12-8015



FIGURE 7





SCALES:

Horizontal 1 : 1250  
 Vertical 1 : 1250

LEGEND

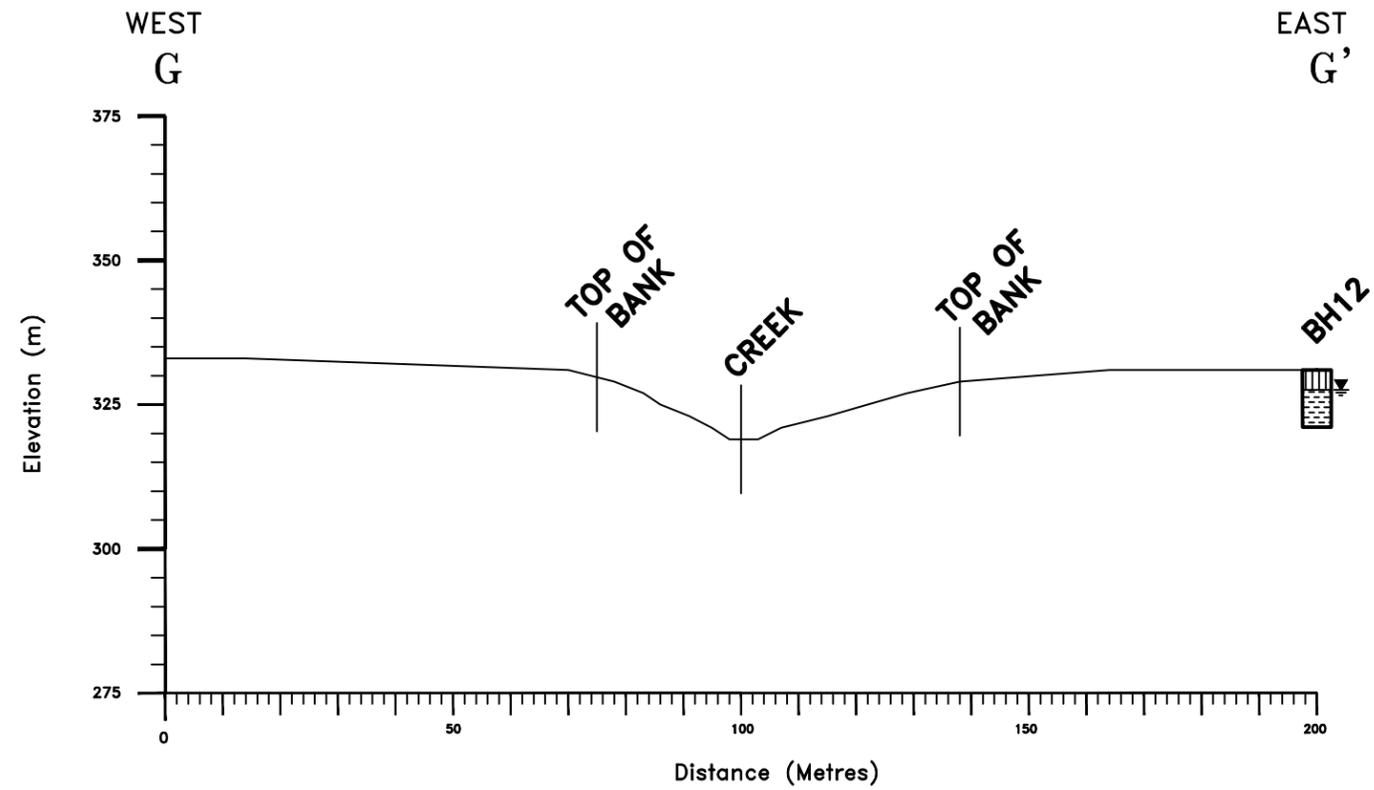
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

CROSS SECTION F-F'

31-12-8015

SECTION G - G'



SCALES:  
 Horizontal 1 : 1250  
 Vertical 1 : 1250

LEGEND			
	TOPSOIL		SHALE
	FILL		STATIC WATER LEVEL
	SILT		WATER FOUND
	SAND		WELL NUMBER/POINT INFORMATION

MAY 2012

CROSS SECTION G-G'

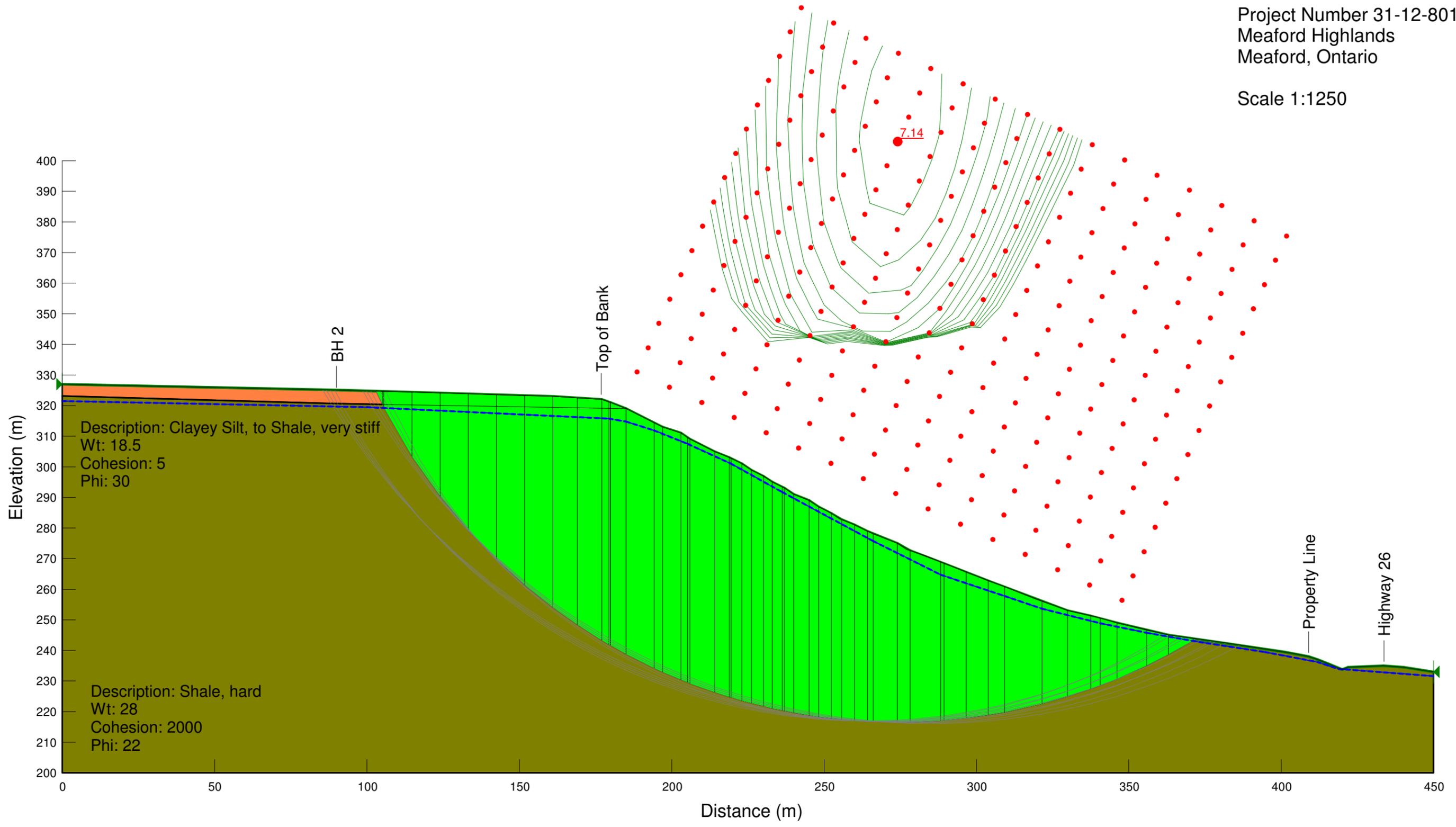
31-12-8015

**Terraprobe**

**Figure 11**  
**Existing Section AA'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:1250

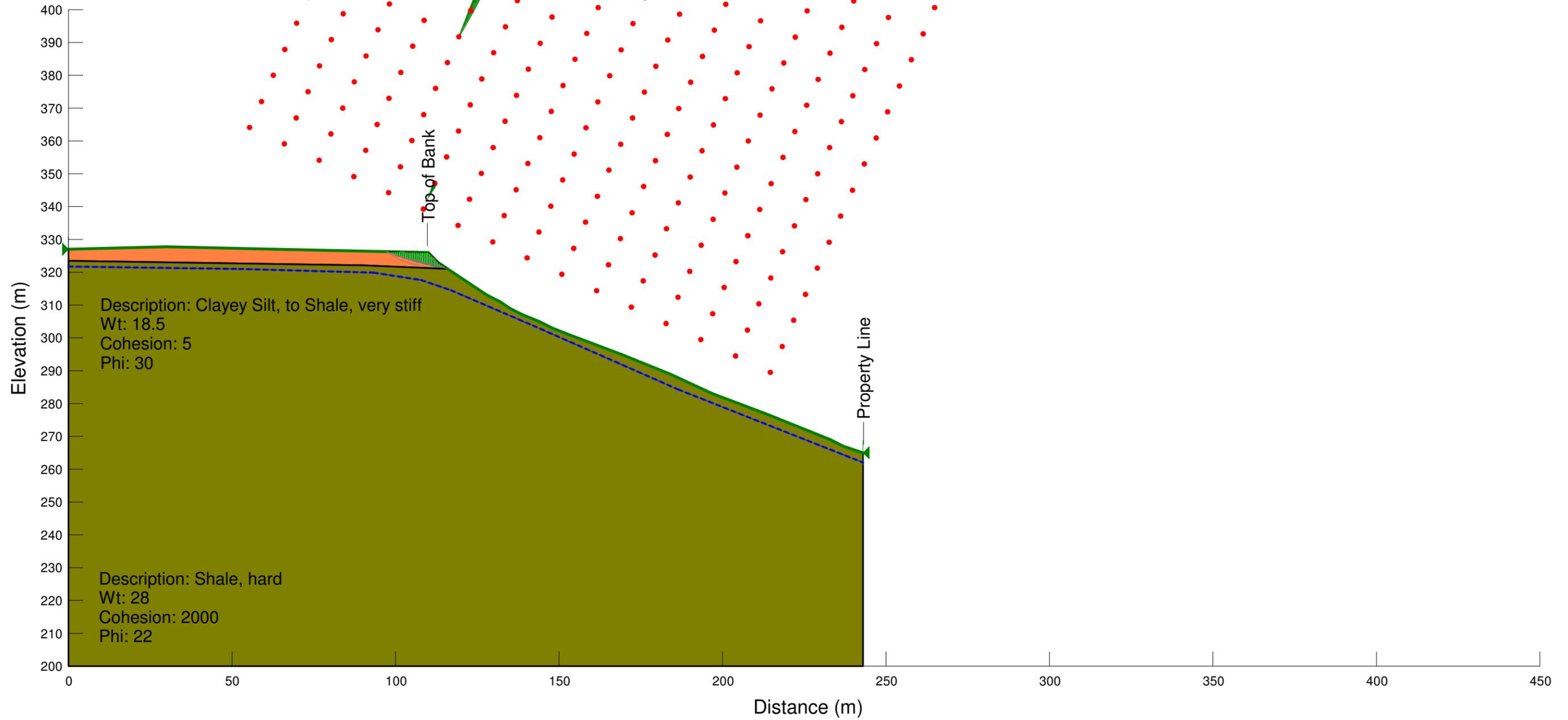


**Terraprobe**

**Figure 12**  
**Existing Section BB'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:1250

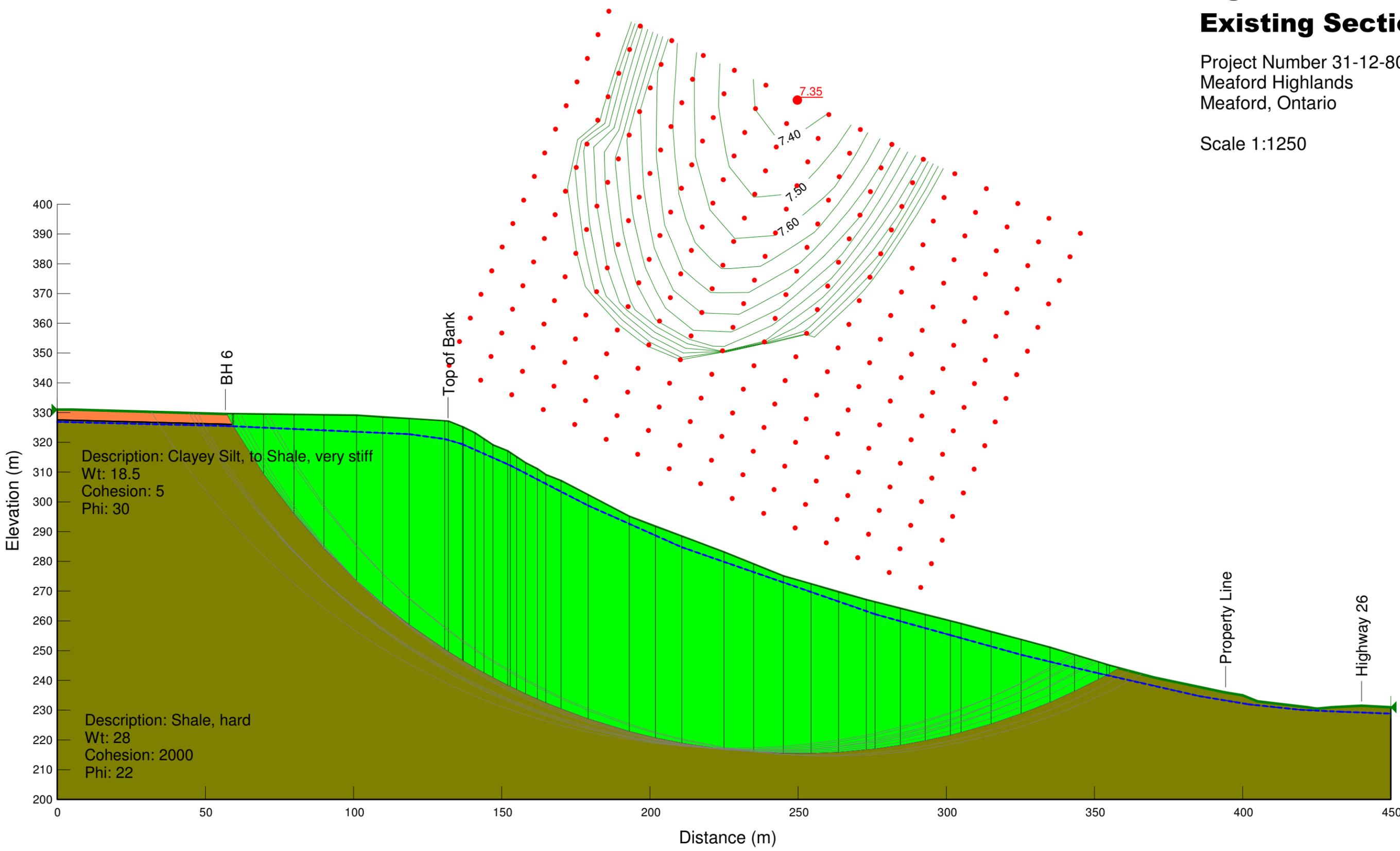


Terraprobe

# Figure 13 Existing Section CC'

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:1250

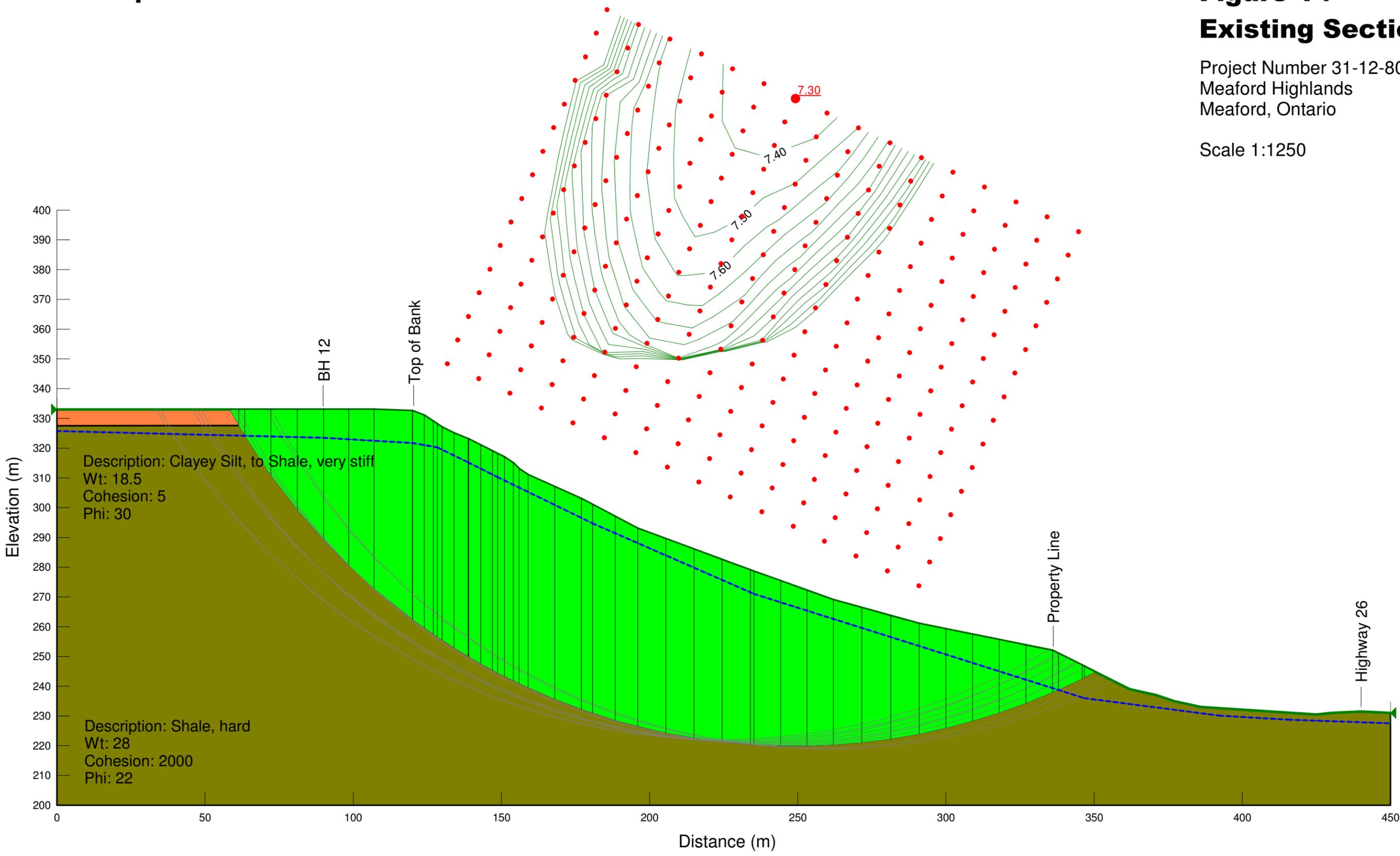


**Terraprobe**

**Figure 14**  
**Existing Section DD'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:1250

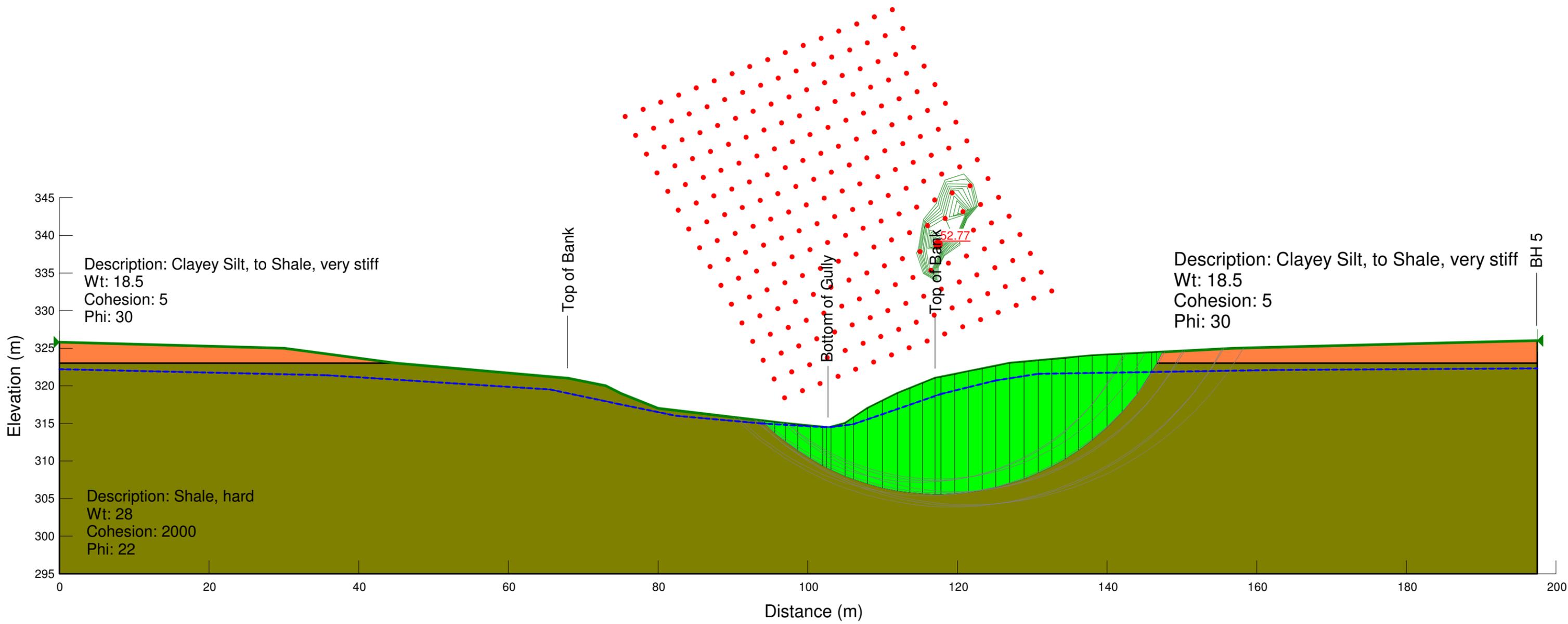


**Terraprobe**

**Figure 15**  
**Existing Section EE'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:500

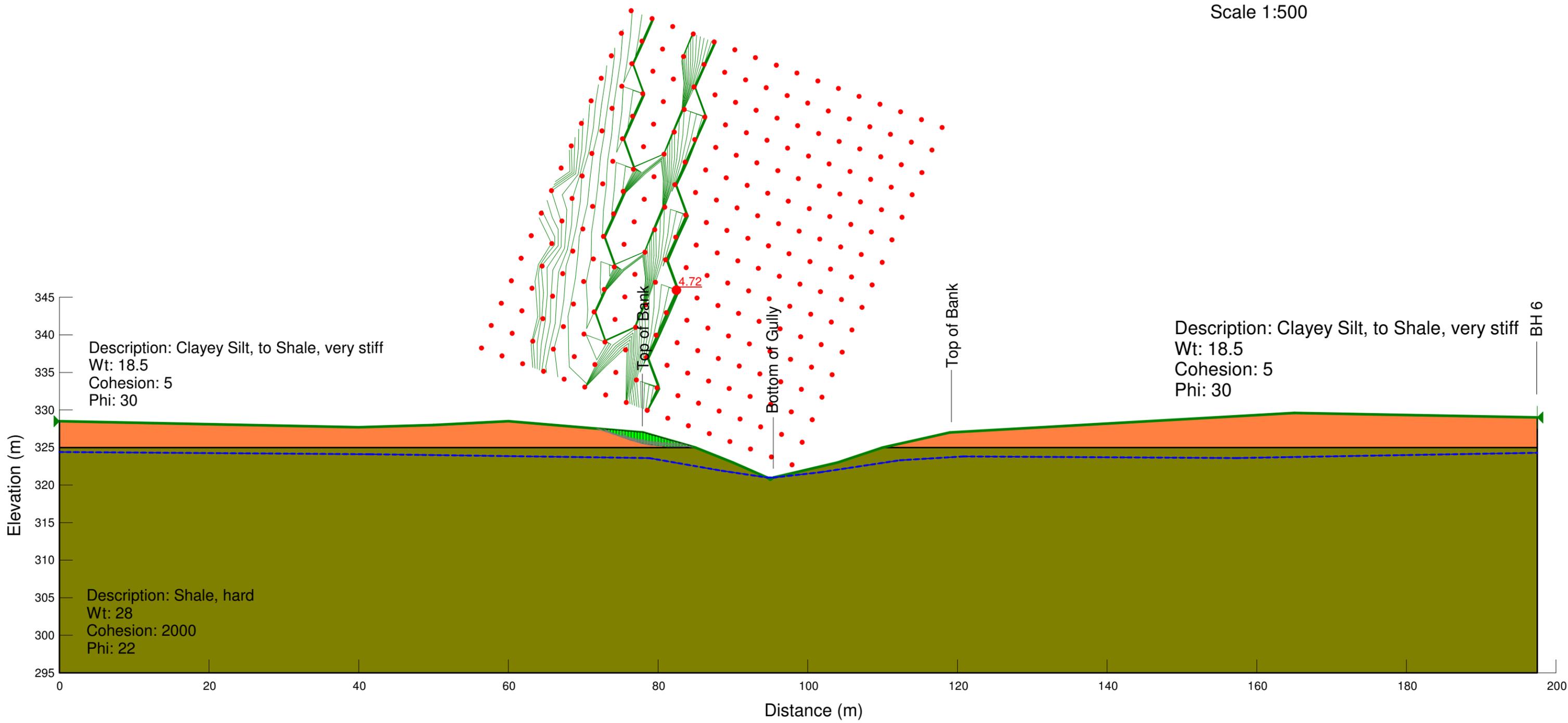


**Terraprobe**

**Figure 16**  
**Existing Section FF'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:500

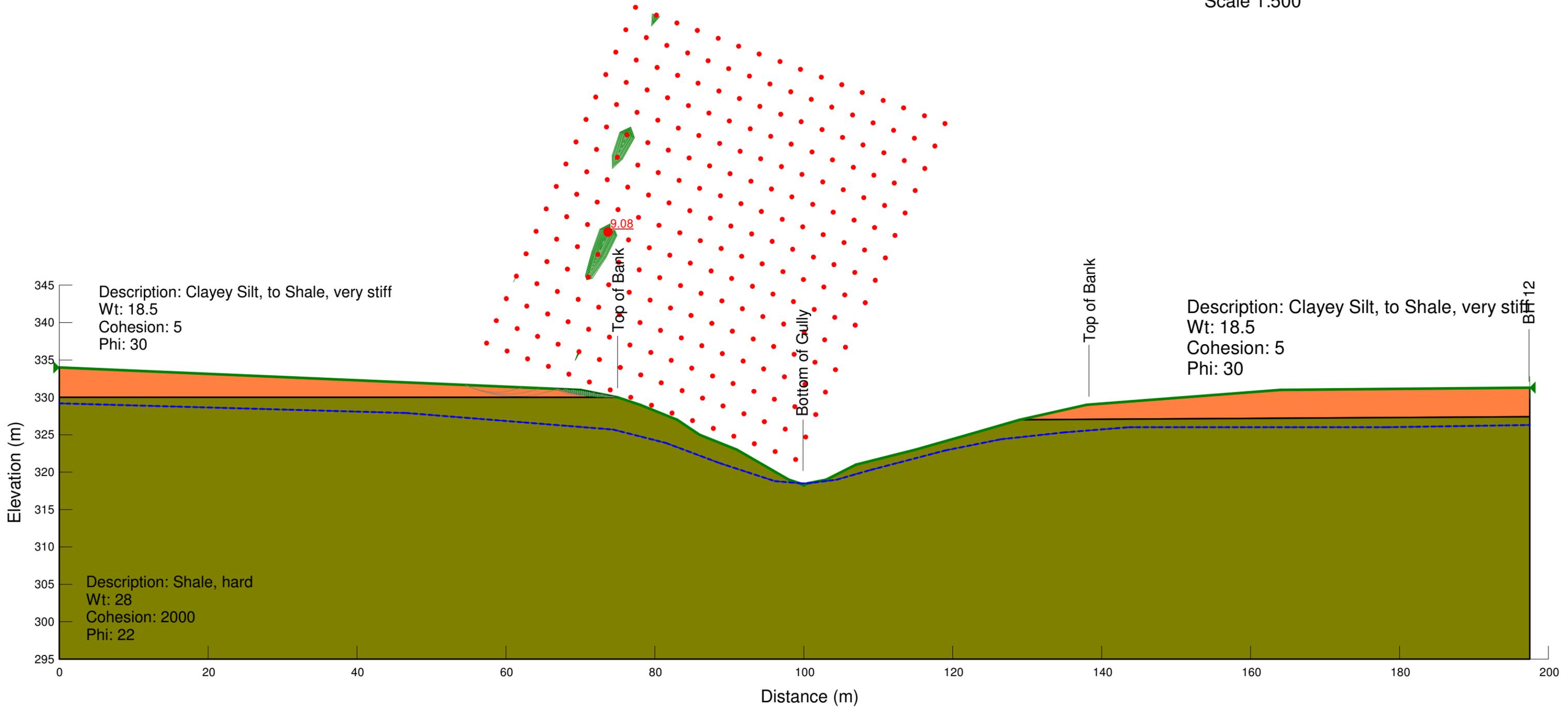


**Terraprobe**

**Figure 17**  
**Existing Section GG'**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:500

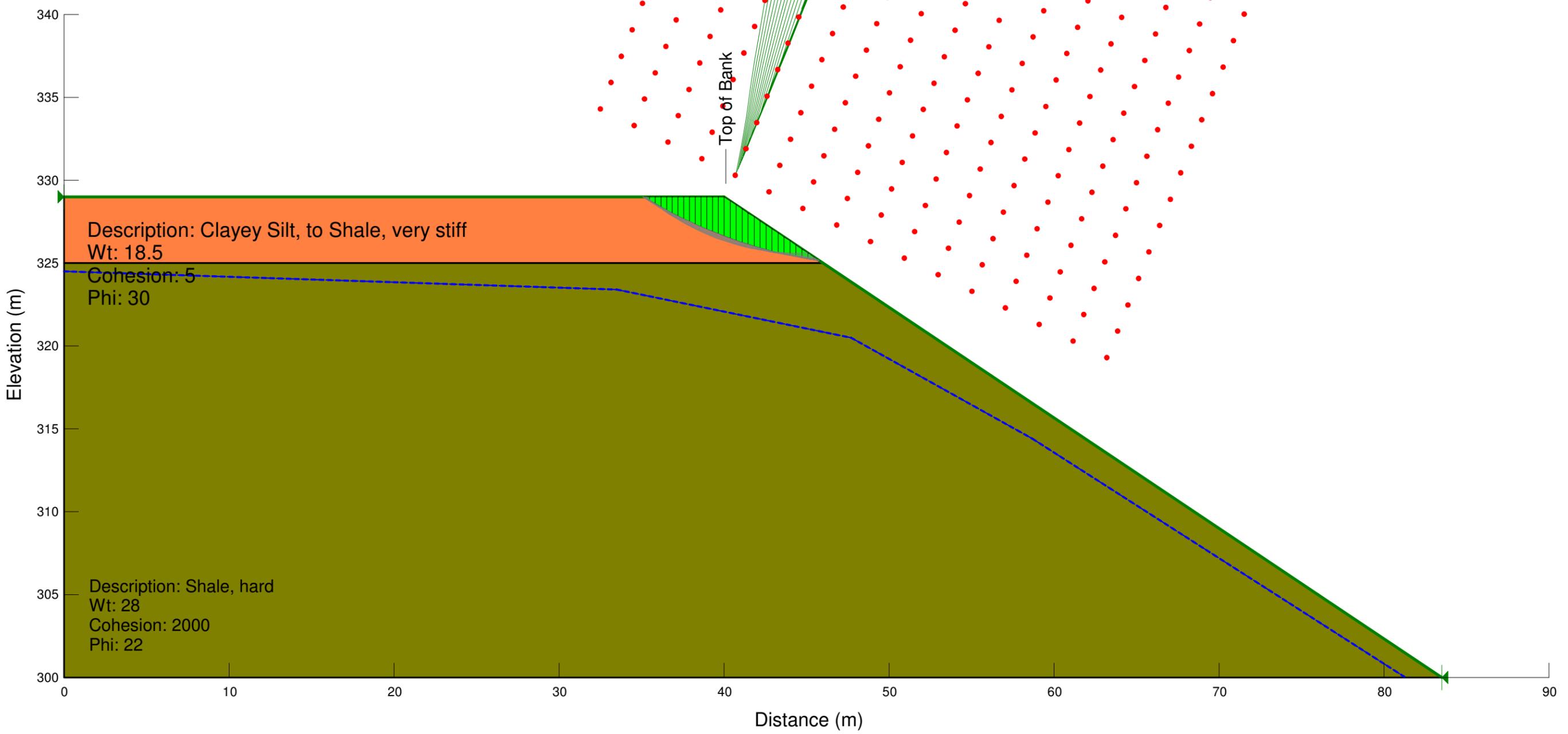


**Terraprobe**

**Figure 19**  
**Hypothetical 1.5:1 Section**  
**For FS = 1.5**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:250

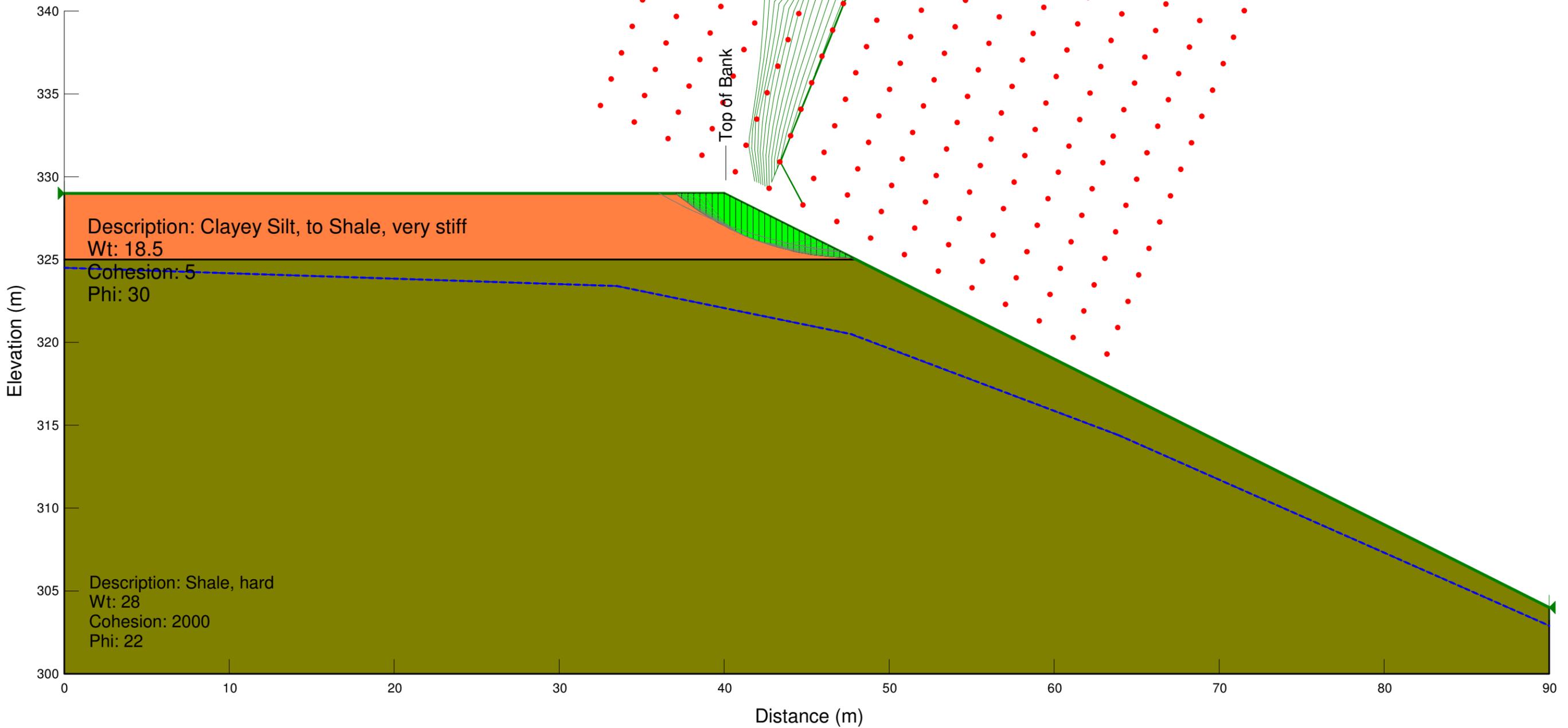


**Terraprobe**

**Figure 18**  
**Hypothetical 2:1 Section**  
**For FS = 1.5**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:250



**Terraprobe**

**Figure 20**  
**Hypothetical 1:1 Section**  
**For FS = 1.5**

Project Number 31-12-8015  
Meaford Highlands  
Meaford, Ontario

Scale 1:250

