APPENDIX H

Geotechnical Report

SUBSURFACE SOIL AND FOUNDATION INVESTIGATION

Waters Edge at Dobbs Ferry
Greenburgh, New York
(06-118)

CARLIN • SIMPSON & ASSOCIATES

Consulting Geotechnical and Environmental Engineers

Robert B. Simpson, P.E.
Principal

Robert J. Carlin, P.E.
Principal Emeritus

61 Main Street, Sayreville, New Jersey 08872
Tel. (732) 432-5757
Fax. (732) 432-5717

Associates:
Meredith R. Anke, P.E.
Frederick V. Osenenko, P.E.
Kurt W. Anke
Eric J. Shaw

17 November 2006

Jacqueline Finkelstein
Waters Edge at Dobbs Ferry LLC
8 Pebble Brook Way
Suite 101
Chappaqua, New York 10514

Re: Report on Subsurface Soil and Foundation Investigation
Waters Edge at Dobbs Ferry
Greenburgh, New York (06-118)

Dear Ms. Finkelstein:

In accordance with our proposal dated 28 August 2006 and your subsequent authorization, we have completed a Subsurface Soil and Foundation Investigation for the referenced site. The purpose of this study was to determine the nature and engineering properties of the subsurface soil and the groundwater conditions for the new development, to recommend a practical foundation scheme, to determine the allowable bearing capacity of the site soils, and to conduct a slope stability analysis for the proposed development.

We understand that the planned construction will consist of the filling of a ravine and the construction of four new homes at the top of a steep slope. To guide us in this study, you have provided us with a site plan that indicates the location of the planned new construction.

Our scope of work for this project included the following:

1. Reviewed the proposed construction, the site conditions, the expected soil conditions, and planned this study.

2. Retained General Borings, Inc. to advance four (4) test borings at the subject site.

3. Selected the boring locations in the field, visually identified the soil layers encountered, obtained soil samples, and prepared detailed logs and a Boring Location Plan.

4. Performed laboratory soil identification tests on selected representative samples.

5. Performed a Slope Stability Analysis for the existing soil slope.

6. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The subject site is located off of Fairlawn Avenue on the west side of Route 9 in Dobbs Ferry, Westchester County, New York. The property is comprised of several proposed residential lots that are currently undeveloped and either grassland or moderately wooded. The eastern and central portions of the site are relatively flat with surface grades sloping down gently to the west. There is a large slope in the western portion of the property that slopes down steeply to the west, towards the adjacent Metro-North Railroad and the Hudson River. The site grades range between elevation +18.0 at the bottom of the existing slope near the railroad, elevation +80.0 at the top of the existing slope, and elevation +90.0 near the existing Fairlawn Avenue in the eastern portion of the subject site.

SUBSURFACE CONDITIONS

To determine the subsurface soil and groundwater conditions at the site, we advanced four (4) test borings at the locations shown on the enclosed Boring Location Plan (Figure 1). The borings were performed by General Borings Inc. in August 2006. Detailed logs have been prepared and are included in this report. All soil samples were visually identified by our inspector and selected soil samples were tested by our laboratory.

Soil

The soil descriptions shown on the boring logs are based on the Burmister Classification System. In this system, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the lesser in lower case letters. The quantity of each lesser component is indicated by the following modifiers:

Modifier	**Quantity**
trace (t)	0 - 10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil conditions encountered in the borings may be summarized as follows:

Stratum 1 Topsoil	The surface layer in each of the test borings is topsoil that is approximately 0'6" in thickness.
Stratum 2 Fill	Beneath the topsoil in borings B-1, B-2, and B-4 is loose to medium dense existing fill that consists of brown coarse to fine Sand, little Silt, trace coarse to fine Gravel, with root fibers, cinders, and coal. The existing fill was encountered to depths ranging from 1'6" to 2'0" beneath the existing ground surface.
Stratum 3 Sand	Underlying the topsoil and fill is medium dense to dense light brown coarse to fine SAND, little (to some) Silt, trace (to and) coarse to fine Gravel with occasional lenses and layers of light brown or gray brown SILT, trace medium to fine Sand. Each of the test borings was terminated in the sand layer at final depths ranging from 37'0" to 42'0" beneath the existing ground surface.

Groundwater

Groundwater was not encountered in any of the four test borings during this investigation. These explorations extended to depths ranging from 37'0" to 42'0" beneath the existing ground surface.

EVALUATION

We understand that a residential subdivision is planned for the subject property and that four homes are proposed at the top of an existing soil slope. In addition, we understand that a reinforced slope will be constructed in the area of an existing ravine.

During this investigation, four (4) test borings were performed to determine the subsurface conditions in the area of the existing slope in the western portion of the subject site. The boring data indicates that the subsurface soils consist of a shallow layer of loose to medium dense existing fill (Stratum 2) that is approximately 1'6" to 2'0" in thickness followed by layers of medium dense to dense coarse to fine Sand with varying amounts of Silt and Gravel (Stratum 3).

The boring data was imported into a slope stability computer program, Slope/W 2004 by Geo-Slope International LTD, in order to perform slope stability analyses for various site conditions. This program uses the Bishop Ordinary, Janbu, Spencer, and Morgenstern-Price Methods for evaluating slope failure. For each condition, a cross-section was generated in the computer program, the analyses were performed, and a factor of safety value was assigned. Figures 3 through 26 show the results of these analyses.

Existing Slope

Based on the boring data, the existing slope consists of approximately 1'6" to 2'0" of loose to medium dense existing fill that is comprised of brown coarse to fine

Sand, little Silt, trace coarse to fine Gravel, with root fibers, cinders, and coal (Stratum 2). Below the fill is medium dense to dense light brown coarse to fine Sand, little (to some) Silt, trace (to and) coarse to fine Gravel with occasional lenses and layers of light brown or gray brown Silt, trace medium to fine Sand (Stratum 3). Based on the topographic survey that was provided to this office, the majority of the existing slope varies from approximately 1.2 horizontal to 1.0 vertical (1.2H:1.0V) to 2.0 horizontal to 1.0 vertical (2.0H:1.0V). There are isolated areas where the slope is flatter (i.e. 2.5H:1.0V). For slopes constructed in soil, we typically recommend a slope of 3 horizontal to 1 vertical (3.0H:1.0V).

To determine the stability of the existing slope, four cross-sections were generated as shown in Figure 2. Slope stability analyses were then performed on these cross-sections using the information obtained from the test borings and based on the existing site conditions as indicated on the most recent topographic survey that was prepared by Paul J. Petretti, Civil Engineer & Land Surveyor and dated 13 April 2006.

When evaluating slope stability, we use a factor of safety (FS) value. Factor of safety is defined as the ratio of the available shear strength of the soil to that required to keep the slope stable or as the ratio of the available resisting forces (cohesion and friction) of the soil to the driving forces (weight of the soil). A factor of safety of less that 1.0 is an indication that a slope is unstable and failure is imminent. Generally accepted factors of safety range from 1.3 to 1.5 and depend on the critical nature of the slope (i.e. loss of life or property damage occur if the slope fails). Based on the proposed construction and the location of the Metro-North Railroad, we recommend that a factor of safety of 1.5 be used for this project.

Based on the boring and laboratory data, we estimate that the existing soil in the slope area has an angle of internal friction (ϕ) that ranges from 32^o to 36^o. Based on the survey information, the slope angle (β) ranges from approximately 26^o to 39^o. This information is used to calculate factors of safety against a slope failure.

There are three types of slope failures that were evaluated in our analyses. These include the following: 1) a surface or slope slide; 2) a crest slope slide; and 3) a deep seated or global slide. A surface slide is also commonly known as a mud slide. In this case, there is a rapid movement of earth from the surface of the slope resulting in a shallow slump. A crest slope slide is a failure that begins near the top (or crest) of the slope where there is a rotational movement of a larger mass (or wedge) of earth along a concave failure plane. A deep seated slide is similar to a crest slide except that the failure plan is deeper into the slope and a larger wedge of soil in involved.

With the aid of computer program, Slope/W 2004, Figures 3 through 26 were generated. These figures show the potential slope failure surfaces under different conditions. The calculated factors of safety for slope stability for each of the four cross-sections shown on Figures 1 and 2 are summarized in Table 1 below. The results are also discussed following the table.

TABLE 1

Figure No.	Section	Condition	Failure Type	Factor of Safety
3	A-A	Dry	Surface	1.183
4	A-A	Dry	Crest	1.232
5	A-A	Dry	Deep	1.339
6	B-B	Dry	Surface	1.087
7	B-B	Dry	Crest	1.158
8	B-B	Dry	Deep	1.298
9	C-C	Dry	Surface	1.075
10	C-C'	Dry	Crest	1.165
11	C-C	Dry	Deep	1.369
12	D-D	Dry	Surface	1.095
13	D-D	Dry	Crest	1.289
14	D-D	Dry	Deep	1.591
15	A-A	Wet	Surface	0.989
16	A-A	Wet	Crest	0.974
17	A-A	Wet	Deep	1.171
18	B-B	Wet	Surface	0.872
19	B-B	Wet	Crest	0.905
20	B-B	Wet	Deep	1.014
21	C-C	Wet	Surface	0.933
22	C-C	Wet	Crest	1.028
23	C-C	Wet	Deep	1.053
24	D-D	Wet	Surface	1.027
25	D-D	Wet	Crest	1.177
26	D-D	Wet	Deep	1.371

Figures 3 through 14 show the potential failure planes for the four cross-sections of the existing slope under dry conditions. As shown by these figures, the most likely failure is a surface slide. The factor of safety associated with a potential surface slide ranges from 1.075 to 1.183, which is just above 1.0. A factor of safety less than 1.0 indicates failure. A change in the groundwater level or drainage could easily trigger this type of slide. Under dry conditions, the factor of safety associated with a potential crest slide ranges from 1.158 to 1.289, which is also below the recommended factor of safety value of 1.5. For the case of a deep seated slide, the factor of safety ranges from 1.298 to 1.591. Three of the four cross-sections have a factor of safety associated with a deep seated slide that is less than the recommended value of 1.5 and is therefore considered to be below the acceptable factor of safety in standard practice. A crest slide or a deep seated failure may detrimentally impact new structures at the top of the slope.

Figures 15 through 26 show the potential failure planes for the four cross-sections of the existing slope in the event that water is present in the slope. The factor of safety for a surface slide under wet conditions ranges from 0.872 to 1.027 and the factor of safety associated with a crest slide under wet conditions ranges from 0.905 to 1.177. These values indicate that these types of slope failures would almost definitely occur in the event of a change in groundwater level due to heavy rainfall or drainage. For the case of a deep seated slide, the factor of safety ranges from 1.014 to 1.371, which is generally just above 1.0. Therefore, there is also a potential for this type of slide to occur given proper conditions.

The slope stability evaluation indicates that the most likely slope failure will be a progressive series of slope slides beginning near the surface of the slope and propagating back into the slope over time with each slide. The potential also exists for a more deep seated slope slide. The trigger mechanism for such a movement would be a sudden rise in the groundwater surface due to heavy rainfall, broken water lines, or a change in the surface drainage.

The existing slope, if left untreated, could potentially slide in the event of heavy rainfall or a change in the surface drainage. This could result in damage to any house in close proximity to the top of the slope as well as the adjacent railroad.

Slope Recommendations

Based on our slope stability analysis, the existing soil slope can become unstable. We understand that a slope failure already occurred nearby to the south of the site, affecting the Metro North railroad tracks to the west. There is a potential for this type of slope failure at the subject site as well. Based on our experience, the catalyst for such a failure is either surface or subsurface water. In order to develop residential lots at the top of the existing slope, treatment of the slope will be required to prevent the potential failures discussed above. Our recommendations are outlined below.

1. The new residences shall be constructed at least 20 feet away from the top of the slope so that they are beyond the deeper seated failure wedge with a factor of safety of 1.5 or greater. Steel H-piles may also be required for the new homes so that the structures can be supported in soil beyond the limits of the deeper seated failure wedge. In addition, no pools shall be constructed within 20 feet of the top of the slope. If decks are proposed within 20 feet of the top of the slope, the foundations must be constructed so that the deck is not influenced by possible creep movements in the slope. A Geotechnical engineer must be retained to review the deck foundation design.
2. The existing grade at the top of the slope shall be lowered approximately 8 to 10 feet. By reducing the height of the slope, the factor of safety associated with a deep seated or global slide is increased. We expect that the new residences will then have walkout basements and that retaining walls will be required between the structures.
3. Drainage is critical in the slope area. All surface drainage must be collected and carried away from the slope area. In addition, the new residences in the slope area shall not have foundation drains and the roof drains must be connected to the stormwater collection system.
4. Soil nails and wire mesh shall be installed on the slope as shown on the drawings. We understand that the TECCO Slope Stabilization System by

Geobrugg will be used for this project. Soil nailing is a technique used to reinforce and strengthen an existing slope. The soil is reinforced by installing closely spaced grouted steel bars (or "nails") into the slope. The grouted nails then increase the shear strength of the overall soil mass. The procedure for installation of the soil nails and wire mesh is simple. First, the soil nail locations are staked out in a pattern according to the requirements for the subject slope. The nail holes are then drilled (or self drilling nails are used) and the nails are installed. The nail holes are then grouted with frost-resistant mortar from the bottom of the hole. A steel wire mesh is then fastened to the nails to cover the entire surface of the slope.

The existing vegetation will remain intact and will only be removed where necessary during construction to install the soil nails and wire mesh. Within one year, the mesh will be covered by the indigenous vegetation.

The number of soil nails required, as well as the spacing of the nails, are determined by the site-specific soil properties (unit weight, ϕ, etc.) and slope properties (height, length, β, etc.). Based of the site characteristics, we expect that a nail spacing of approximately 6 to 10 feet will be required for the site. We also expect that each of the nails will be approximately 15 to 25 feet long.

The actual extent and design of the soil nails and the wire mesh will be determined by Carlin-Simpson & Associates at a later date. The soil nails and mesh will be designed so that the factors of safety associated with a surface slide and a crest slide will be greater than 1.5. We will also prepare detailed plans and project specifications. A Contractor shall then be retained to implement the design. We have included manufacturers' information on soil nails and wire mesh in the appendix of this report.

The above recommendations will improve the overall stability of the existing slope allowing the new residences to be safely constructed beyond 20 feet from the top of the improved slope.

Ravine Recommendations

We understand that the existing ravine in the northwestern portion of the subject site will be filled or partially filled and that a reinforced soil slope will be constructed at this location.

In order to prepare the ravine area for construction, the existing surface materials (i.e. topsoil, surface vegetation, etc.) shall be completely removed from the planned slope area. In addition, the existing fill shall be completely removed from the planned slope area down to the virgin sand. The removal of the topsoil and existing fill shall extend at least 10 feet beyond the limits of new reinforced slope.

After the topsoil and existing fill have been removed and prior to the placement of new fill, the exposed subgrade shall be proofrolled by several overlapping passes of a large vibratory drum roller. The proofrolling is required to densify the underlying soils. If any excessive movement is noted during the proofrolling, the soft soil shall be removed and replace with new compacted fill.

The new fill used to construct the reinforced slope shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers about one foot thick and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D-1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers. The fill layers must be benched into the existing slope for slope stability.

For design of the reinforced slope, we estimate the backfill material will have an in place density of about 130 pcf and an angle of internal friction, $\phi = 32^{o}$. Drains are also recommended in the soil slope to collect subsurface water and convey it away from the new slope area.

Proposed Residences

At the time this report was prepared, the proposed building locations, finished floor elevations, and site grading were not finalized. Once this information is available, a copy of the plans should be forwarded to our office so that we can review them along with the recommendations in this report. We can then make additional recommendations for each of the individual residences. Specifically, it may be necessary to construct the new residences on steel H-pile foundations. In the event that H-piles are necessary for these structures, we expect the H-piles to consist of 10HP42 piles driven to depths of 20 to 35 feet.

In general, topsoil and existing fill were encountered at the surface in the test borings extending to depths ranging from 1'6" to 2'0" below the existing ground surface. The topsoil and existing fill are not acceptable bearing materials for the new residences and must be completely removed from the planned building areas down to the virgin soil. Since basements are planned for the new residences, we expect that all of the existing fill will be removed from these areas during the basement excavations. The removal of the surface layers and existing fill shall extend at least 10 feet beyond the limits of the new building lines.

Once the planned footing elevation has been achieved, the new foundations may be installed, bearing on new compacted fill or virgin sand. The new foundations may be designed as spread footings, utilizing a net design bearing pressure of 1.5 TSF. All exterior foundations shall bear at least 42 inches below finished grade for protection from frost. The wall footings shall have a minimum width of 18 inches and column footings, if required, shall have a minimum dimension of 30 inches.

After the footings and foundation walls are completed, fill will be required to backfill these excavations and to raise grades in the building area to the slab subgrade elevation. New fill shall consist of sand and gravel containing less than 20 percent by weight passing a No. 200 sieve. The fill shall be placed in layers up to one foot thick and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D1557). Fill layers shall be placed, compacted, tested, and approved before placing subsequent layers.

The new floor slabs may be designed as a slab on grade supported on the virgin soil and the new compacted fill. We recommend a Modulus of Subgrade Reaction (k_s) of 200 pci be used for design. A minimum of six (6) inches of crushed stone gravel should be provided beneath the slabs for drainage.

Building settlement will be less than ½-inch, which is within tolerable limits for these structures.

Basement Walls

We understand that basements are planned for the new residences. As discussed above, foundation drains shall not be installed for the new structures. However, the outside face of the basement walls must be waterproofed.

The basement walls shall be backfilled in layers approximately one foot thick and the new fill shall be compacted with small hand guided vibratory compactors to at least 92% of its Maximum Modified Dry Density. Outside the residence area, the backfill placed adjacent to the foundation walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve.

The soil adjacent to the basement walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and the coefficient of earth pressure at rest (k_o) which is applicable to non-yielding building walls. We estimate that the backfill material will have an in-place density of about 130 pcf and $k_o = 0.47$. These assumptions result in an equivalent fluid pressure of 61.1 pcf against the basement walls. For design, a friction factor ($\tan \delta$) of 0.40 may be used between the footing concrete and the bearing soil.

Retaining Walls

We expect that retaining walls will be required between the residences near the top of the soil slope. The type of wall and elevations are unknown at this time.

The foundations for the new retaining walls may be placed on the virgin soil or on new compacted fill approved by Carlin-Simpson & Associates. New compacted fill shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing the No. 200 sieve. The fill shall be placed in 6 to 12 inch layers and compacted to at least 95% of its Maximum Modified Dry Density. The footings or base of the walls can be designed using a net design bearing pressure of 1.5 TSF.

The footings or base of the walls shall bear at least 42 inches below finished grade of the outside face of the wall for protection from frost. To prevent a buildup of hydrostatic pressure behind the wall, a minimum of 12 inches of 3/4-inch to 3/8-inch crushed stone shall be installed directly behind the wall. In addition, a drain shall be installed behind the wall. The wall drains shall be connected into the site stormwater collection system since they cannot be daylighted in the area of the soil slope.

Backfill placed directly behind the retaining walls shall consist of either suitable on-site soil or imported sand and gravel containing less than 20% by weight passing a No. 200 sieve. Each layer shall be compacted using a hand guided mechanical tamper to 92% of its Maximum Modified Dry Density (ASTM D1557). Excessive compaction adjacent to the retaining walls must be avoided. Layers shall be tested and approved before placing subsequent layers. Large compaction equipment must not be used within ten (10) feet of the new walls to prevent potential damage to the walls.

The soil adjacent to the retaining walls will exert a horizontal pressure against the walls. This pressure is based on the soil density and the Coefficient of Active Earth Pressure (k_a). We estimate the backfill material will have an in place density of about 130 pcf and an angle of internal friction, $\phi = 32^o$. The active earth pressure coefficient, k_a, is 0.31 provided the grade behind the wall is level. Based on these properties, the retained soil will produce an Equivalent Fluid Pressure (EFP) of 40.0 pcf against the retaining wall. If a sloping grade is proposed, the k_a and EFP must be adjusted accordingly.

Seismic Design Considerations

The new structures shall be designed to resist stress produced by lateral forces computed in accordance with Section 1615 of the New York State Building Code. The project site can be classified as Site Class D - Stiff Soil Profile. The following values can be used for this project.

Mapped Spectral Response Acceleration for Short Periods, [Fig 1615 (1)]	S_S=0.40g
Mapped Spectral Response Acceleration at 1-Second Period, [Fig 1615 (2)]	S_{S1}=0.09g
Site Coefficient [Table 1615.1.2 (1)]	F_a=1.48
Site Coefficient [Table 1615.1.2 (2)]	F_v=2.40
Max Considered Earthquake Spectral Response for Short Periods [Eq 16-16]	S_{MS}=0.59g
Max Considered Earthquake Spectral Respond at 1-Second Period [Eq 16-17]	S_{M1}=0.22g
Design Spectral Response Acceleration for Short Periods [Eq 16-18]	S_{DS}=0.39g
Design Spectral Response Acceleration for 1-Second Period [Eq 16-19]	S_{D1}=0.14g

SUITABILITY OF THE ON-SITE SOILS FOR USE AS COMPACTED FILL

The suitability of each soil stratum for use as compacted fill is discussed below.

Stratum 1
Topsoil

Topsoil is not suitable for use as compacted fill. During the excavation, it may be stockpiled on site for later use in the landscaped areas or removed from the site.

Stratum 2
Fill

The existing fill that was encountered in portions of the site contains coarse to fine Sand, little Silt, trace coarse to fine Gravel, with root fibers, cinders, and coal. The existing fill may be suitable for use as compacted fill provided that all debris and organic material (i.e. topsoil, roots, etc.) have been removed prior to its reuse and that the material remains relatively dry for optimum compaction.

Stratum 3
Sand

The virgin site soils that may be excavated from the site excavations consist primarily of sand with varying amounts of silt and gravel. This material may be suitable for use as compacted fill, provided that it remains relatively dry for optimum compaction prior to its reuse.

Our laboratory test results indicate that the on site soils contain a varying percentage of silt. In addition, the in-situ moisture content of the site soils is at or above the optimum moisture content for these types of soils. If the material is or becomes too wet, it will pump when compacted and the Contractor will not be able to achieve the required maximum density. In the event that the on-site fill material is or becomes too wet and cannot be adequately compacted, the material should be allowed to dry or a drier cleaner fill will be required.

GENERAL

The recommendations in this report regarding the proposed residences and retaining walls are preliminary in nature and are not intended for final design and construction. At this time, the proposed building locations, finished floor elevations, and site grading have not been finalized. Once this information is available, a copy of the plans should be forwarded to our office for review. At that time, we will review our recommendations and provide additional recommendations, as needed, to complete the design.

During this investigation, we have evaluated the existing slope in the western portion of the subject site. Based on the site conditions, our observations, the test boring data, and our calculations, we believe that the existing slope can become unstable unless some form of slope stability protection is provided. We recommend soil nailing and wire mesh to stabilize the subject slope. We have also provided preliminary construction recommendations for the new residences in the above text.

The existing slope is very steep and visibly shows signs of sloughing, as indicated by the surface vegetation and scattered trees. The factor of safety associated with a surface slide ranges from 1.075 to 1.183, which is very low and indicates that a slope slide is likely for this site if there is a change in groundwater level due to heavy rainfall or drainage. The planned development will improve the existing slope conditions by improving the area drainage and stabilizing the slope surface with a soil nail and wire mesh slope stabilization system.

In order to preserve continuity in this project, the Owner shall retain the services of Carlin-Simpson & Associates to provide full time Geotechnical-related inspection during construction. This shall include the inspection of: 1) the installation of soil nails and wire mesh on the existing slope; 2) the removal of unsuitable soil from the new slope area; 3) the proofrolling of the subgrade soil prior to placement of compacted fill; 4) the placement and compaction of controlled fill; 5) the installation of reinforcement in the new slope area; 6) the excavations for the new building and retaining wall foundations; 7) the installation of any H-piles for the new structures, if necessary; and 8) preparation of the subgrade for the new floor slabs.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for letting us assist you on this project. Should you have any questions or comments, please contact this office.

Very truly yours,

CARLIN-SIMPSON & ASSOCIATES

MEREDITH R. ANKE
Project Engineer

STATE OF NEW YORK
ROBERT B. SIMPSON
081840-1
LICENSED PROFESSIONAL ENGINEER

ROBERT B. SIMPSON, P.E.

File No. 06-118

CARLIN - SIMPSON & ASSOCIATES Sayreville, New Jersey	TEST BORING LOG	BORING NUMBER B-1
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 1 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118
Drilling Contractor: General Borings Inc.		ELEVATION: +79.5
		DATUM:

GROUNDWATER					CASING	SAMPLE	CORE	TUBE
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS		
				DIA.	3 1/4"	1 3/8"		
No water encountered				WGHT		140 LBS		
				FALL		30"		

START DATE:	31 Aug 06
FINISH DATE:	31 Aug 06
DRILLER:	Jim & Dave
INSPECTOR:	FVO

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION	REMARKS
			2	**TOPSOIL** 0'6"	
1		S-1	1	FILL (Br cf S, l $, w/root fibers)	Rec = 16"
			2	**FILL (Brown coarse to fine SAND,**	moist
2			2	**little Silt, with root fibers)** 2'0"	
			3	Lt br cf S, l (-) $, t (-) f G	
3		S-2	4		Rec = 16" moist
			3	**Light brown coarse to fine SAND,**	
4			11	**little (-) Silt, trace (-) fine Gravel**	
5					
			28	same	
6		S-3	22		Rec = 10" moist
			17		
7			17	7'0"	
			16	Lt br cf G a (+), cf S, l (-) $	
8		S-4	17		Rec = 10" dry
			21	**Light brown coarse to fine Gravel**	
9			21	**and (+), coarse to fine Sand, little (-) Silt**	
10					No recovery
		S-5	50		
11				Auger pulled up coarse Gravel	
12				12'0"	Refusal @ 11'5"
13				**Light brown coarse to fine SAND,**	
14				**trace Silt, some coarse to fine Gravel**	
15					
		A	18	Lt br cf S, t $, s cf G	
16		S-6	13		Rec = 14"
			15	16'6"	moist
17		B	16	Lt br mf S, s $	
18					
19				**Light brown medium to fine SAND, some Silt**	
20					
			9	No recovery	No recovery
21		S-7	12		Gravel in tip
			50		Moved boring
22					

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-1
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 2 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25			13		Lt br cf S, l $, l (+) mf G	
26		S-8	14			Rec = 10" moist
			18			
27			25		**Light brown coarse to fine SAND, little Silt, little (+) medium to fine Gravel**	
28						
29						
30					30'0"	
		A	15		Lt br cf S, t (-) $, t (-) f G, w/$ lenses	
31		S-9	28			Rec = 22" moist
			31			
32		B	39			
33					**Light brown coarse to fine SAND, trace (-) Silt, trace (-) fine Gravel, with silt lenses**	
34						
35					35'0"	
			50		Lt br $, s, mf S, t mf G	
36		S-10	26			Rec = 14" moist
			19			
37			35		**Light brown SILT some, medium to fine Sand, trace medium to fine Gravel**	
38						
39						
40			13		same	
41		S-11	26		41'2"	Rec = 22" moist
			37		Lt br cf S, t $, t f G	
42			35		**Light brown coarse to fine SAND, trace Silt, trace fine Gravel** 42'0"	
					End of Boring @ 42'0"	
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, New Jersey	TEST BORING LOG	BORING NUMBER B-2

Project:	Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY	SHEET NO.:	1 of 2
Client:	JSF Development, LLC	JOB NUMBER:	06-118
Drilling Contractor:	General Borings Inc.	ELEVATION:	+81.0

GROUNDWATER					CASING	SAMPLE	CORE	TUBE		
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:	
				DIA.	3 1/4"	1 3/8"			START DATE:	31 Aug 06
No water encountered				WGHT		140 LBS			FINISH DATE:	31 Aug 06
				FALL		30"			DRILLER:	Jim & Dave
									INSPECTOR:	FVO

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION	REMARKS
			3	**TOPSOIL** 0'6"	
1		S-1	9	FILL (Br cf S, l (-) $)	Rec = 14"
			15	**FILL (Brown coarse to fine SAND,**	moist
2			14	**little (-) Silt)** 2'0"	
			12	Lt br cf S, l (-) $	
3		S-2	11		Rec = 16"
			10	**Light brown coarse to fine SAND,**	moist
4			9	**little (-) Silt**	
5				5'0"	
			15	Lt br cf S, s $, s mf G	
6			16	**Light brown coarse to fine Sand, some**	
		S-3	15	**Silt, some medium to fine Gravel**	Rec = 6"
7			22	7'0"	moist
			15	Lt br cf S, l $, s (+) mf G	
8			12		
		S-4	15		Rec = 8"
9			13		moist
10			50		
			50		
11		S-5		**Light brown coarse to fine SAND,**	No recovery
				little Silt, some (+) medium to fine	
12				**Gravel**	
13					
14					
15					
			8		No recovery
16		S-6	7		Gravel in tip
			16		
17			15		
18					
19					
20					
			16	Lt br cf S, l $, a mf G	
21		S-7	14		Rec = 6"
			23		moist
22			20		

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-2
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 2 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25					25'0"	
			8		Lt br cf S, t (-) $, l cf G	
26		S-8	9			Rec = 5" moist
			12			
27			13			
28					**Light brown coarse to fine SAND, trace (-) Silt, little coarse to fine Gravel**	
29						
30						
		A	29		Lt br cf S, t $, s mf G	
31		S-9	35			Rec = 12" moist
			20		31'6"	
32		B	28		Lt br $ s, cf S, t mf G	
33						
34					**Light brown SILT some, coarse to fine Sand, trace medium to fine Gravel**	
35						
			60			
36		S-10	34			No recovery
			44			
37			50		37'0"	
					End of Boring @ 37'0"	
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, New Jersey	TEST BORING LOG	BORING NUMBER B-3
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 1 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118
Drilling Contractor: General Borings Inc.		ELEVATION:

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE: 31 Aug 06
				DIA.	3 1/4"	1 3/8"			FINISH DATE: 31 Aug 06
No water encountered				WGHT		140 LBS			DRILLER: Jim & Dave
				FALL		30"			INSPECTOR: FVO

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**TOPSOIL** 0'6"	
1		S-1	1		Lt br cf S, l $, root fibers	Rec = 16"
			1			moist
2			2			
			4		same	
3		S-2	3		**Light brown coarse to fine SAND, little Silt, root fibers**	Rec = 12"
			3			moist
4			2			
5					5'0"	
			7		Lt br cf S, l $	
6		S-3	7			Rec = 18"
			9			moist
7			10			
			13		same	
8		S-4	13		**Light brown coarse to fine SAND, little Silt**	Rec = 20"
			13			moist
9			16			
10					10'0"	
			12		Lt br cf S, t $, s cf G	
11		S-5	39			Rec = 6"
			11			moist
12			25		**Light brown coarse to fine SAND, trace Silt, some coarse to fine Gravel**	
13						
14						
15						
			25		Lt br cf S, t (-) $, l (+) cf G	
16		S-6	22			Rec = 3"
			20			moist
17			10			
18						
19						
20						
			12		Lt br cf S, t (-) $, s mf G	
21		S-7	10			Rec = 4"
			12			moist
22			14			

CARLIN - SIMPSON & ASSOCIATES Sayreville, New Jersey	TEST BORING LOG	BORING NUMBER B-3
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 1 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118
Drilling Contractor: General Borings Inc.		ELEVATION:

GROUNDWATER					CASING	SAMPLE	CORE	TUBE	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			DATUM:
				DIA.	3 1/4"	1 3/8"			START DATE: 31 Aug 06
No water encountered				WGHT		140 LBS			FINISH DATE: 31 Aug 06
				FALL		30"			DRILLER: Jim & Dave
									INSPECTOR: FVO

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
			2		**TOPSOIL** 0'6"	
1		S-1	1		Lt br cf S, l $, root fibers	Rec = 16" moist
			1			
2			2			
			4		same	
3		S-2	3		**Light brown coarse to fine SAND, little Silt, root fibers**	Rec = 12" moist
			3			
4			2			
5					5'0"	
			7		Lt br cf S, l $, mottled	
6		S-3	7			Rec = 18" moist
			9			
7			10			
			13		same	
8		S-4	13		**Light brown coarse to fine SAND, little Silt, mottled**	Rec = 20" moist
			13			
9			16			
10					10'0"	
			12		Lt br cf S, t $, s cf G	
11		S-5	39			Rec = 6" moist
			11			
12			25		**Light brown coarse to fine SAND, trace Silt, some coarse to fine Gravel**	
13						
14						
15						
			25		Lt br cf S, t (-) $, l (+) cf G	
16		S-6	22			Rec = 3" moist
			20			
17			10			
18						
19						
20						
			12		Lt br cf S, t (-) $, s mf G	
21		S-7	10			Rec = 4" moist
			12			
22			14			

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-3
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 2 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
23						
24						
25						
			15	■	Lt br cf S, t (-) $, s mf G	
26		S-8	21	■		No recovery
			25	■		
27			29	■	**Light brown coarse to fine SAND, trace (-) Silt, some medium to fine Gravel**	
28						
29						
30					30'0"	
			18	■	Vvd gr br $, t (-) mf S	
31		S-9	14	■		Rec = 22" moist
			18	■		
32			19	■		
33					**Varved gray brown SILT, trace (-) medium to fine Sand**	
34						
35						
			26	■	same	
36		S-10	30	■		Rec = 20" moist
			37	■		
37			38	■		
38					38'0"	
39					**Light brown coarse to fine SAND, some Silt, trace medium to fine Gravel**	
40						
			38	■	Lt br cf S, s $, t mf G	
41		S-11	41	■		Rec = 20" moist
			65	■	41'8"	
42					**End of Boring @ 41'8"**	
43						
44						
45						
46						
47						

CARLIN - SIMPSON & ASSOCIATES Sayreville, New Jersey	TEST BORING LOG	BORING NUMBER B-4

Project:	Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY	SHEET NO.:	1 of 2
Client:	JSF Development, LLC	JOB NUMBER:	06-118
Drilling Contractor:	General Borings Inc.	ELEVATION:	

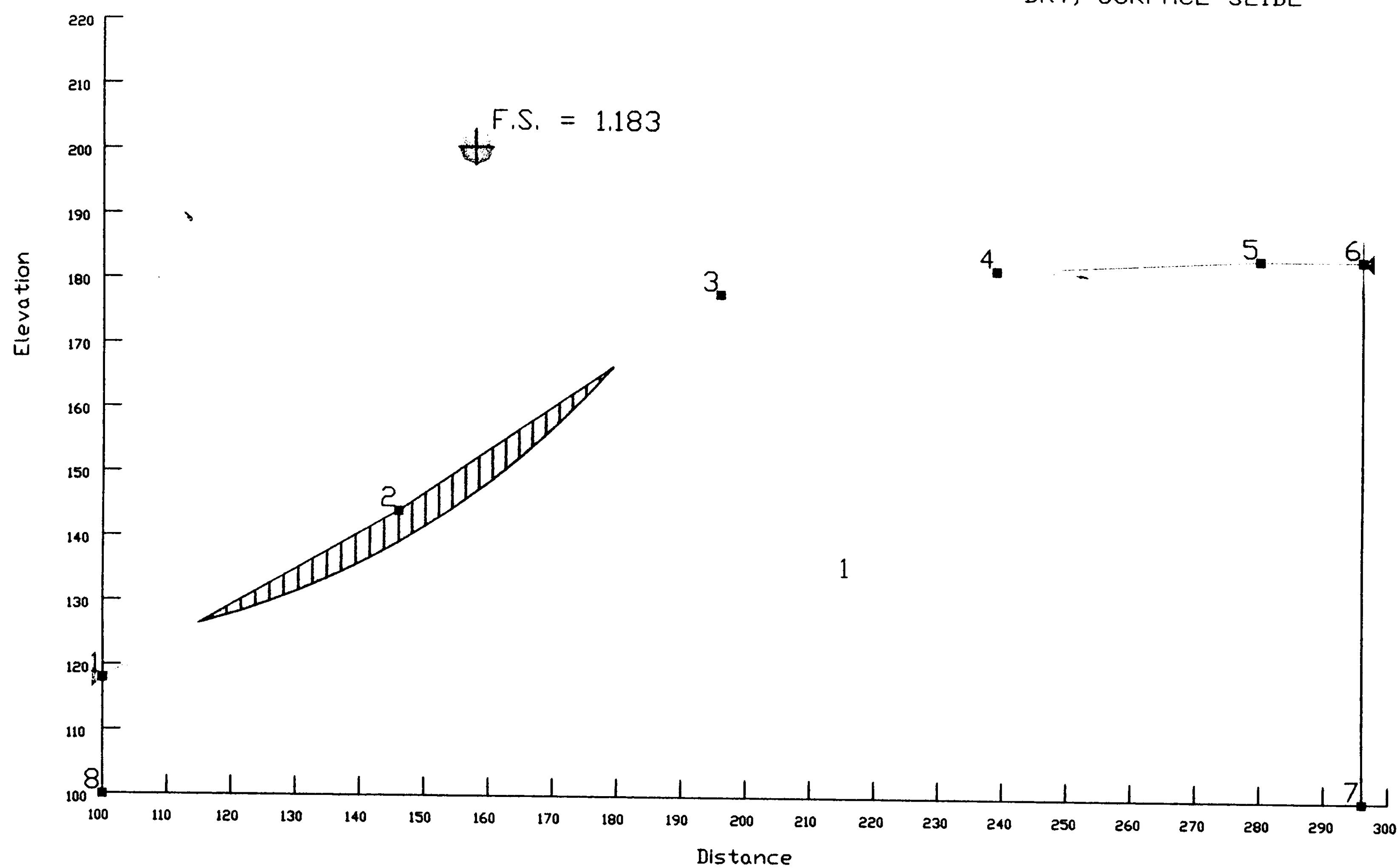
GROUNDWATER					CASING	SAMPLE	CORE	TUBE	DATUM:	
DATE	TIME	DEPTH	CASING	TYPE	HSA	SS			START DATE:	31 Aug 06
			HSA	DIA.	3 1/4"	1 3/8"			FINISH DATE:	31 Aug 06
No water encountered				WGHT		140 LBS			DRILLER:	Jim & Dave
				FALL		30"			INSPECTOR:	FVO

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	Sym	IDENTIFICATION	REMARKS
		A	2		**TOPSOIL** 0'6"	
1		S-1	3		FILL (Br cf S, l (+) $, t f G, w/cinders, coal)	Rec = 14"
			5		**FILL (Brown coarse to fine SAND, little (+) Silt, trace fine Gravel, with cinders, coal)** 1'6"	moist
2		B	5			
			4			
3		S-2	5		Lt br cf S, l $, t cf G	Rec = 14" moist
			6			
4			4		same	
5						
			5		same	
6		S-3	5			Rec = 20" moist
			8			
7			9			
			16		same, l $	
8		S-4	50/3"			Rec = 6" moist
9					**Light brown coarse to fine SAND, little Silt, trace coarse to fine Gravel**	
10						
11						
12						
13					13'0"	
14						
15						
			45		Gr cf G l, cf S, t $	
16		S-5	25			Rec = 4" moist
			38			
17			40			
18					**Gray coarse to fine GRAVEL little, coarse to fine Sand, trace Silt**	
19						
20						
			48			
21		S-6	69			No recovery
22					22'0"	

CARLIN - SIMPSON & ASSOCIATES Sayreville, NJ	TEST BORING LOG	BORING NUMBER B-4
Project: Proposed Lots 1-4, Waters Edge @ Dobbs Ferry, Greenburgh, NY		SHEET NO.: 2 of 2
Client: JSF Development, LLC		JOB NUMBER: 06-118

Depth (ft.)	Casing Blows per Foot	Sample Number	Blows on Sample Spoon per 6"	IDENTIFICATION	REMARKS
23					
24					
25					
26		S-7	15 / 24 / 30 / 32	Lt br mf S, l $, w/silt lenses	Rec = 12" moist
27					
28					
29					
30					
31		S-8	20 / 33 / 50 / 60	Vvd br gr $, t mf S	Rec = 18" moist
32				**Light brown coarse to fine SAND, little Silt, trace (-) fine Gravel, with silt lenses**	
33					
34					
35					
36		S-9	32 / 56 / 50/3"	Lt br cf S, l $, t (-) f G, w/silt lenses	Rec = 10" moist
37					
38					
39					
40					
41		S-10	35 / 36 / 46 / 60	Lt br mf S, l $	Rec = 18" moist
42				42'0"	
				End of Boring @ 42'0"	
43					
44					
45					
46					
47					

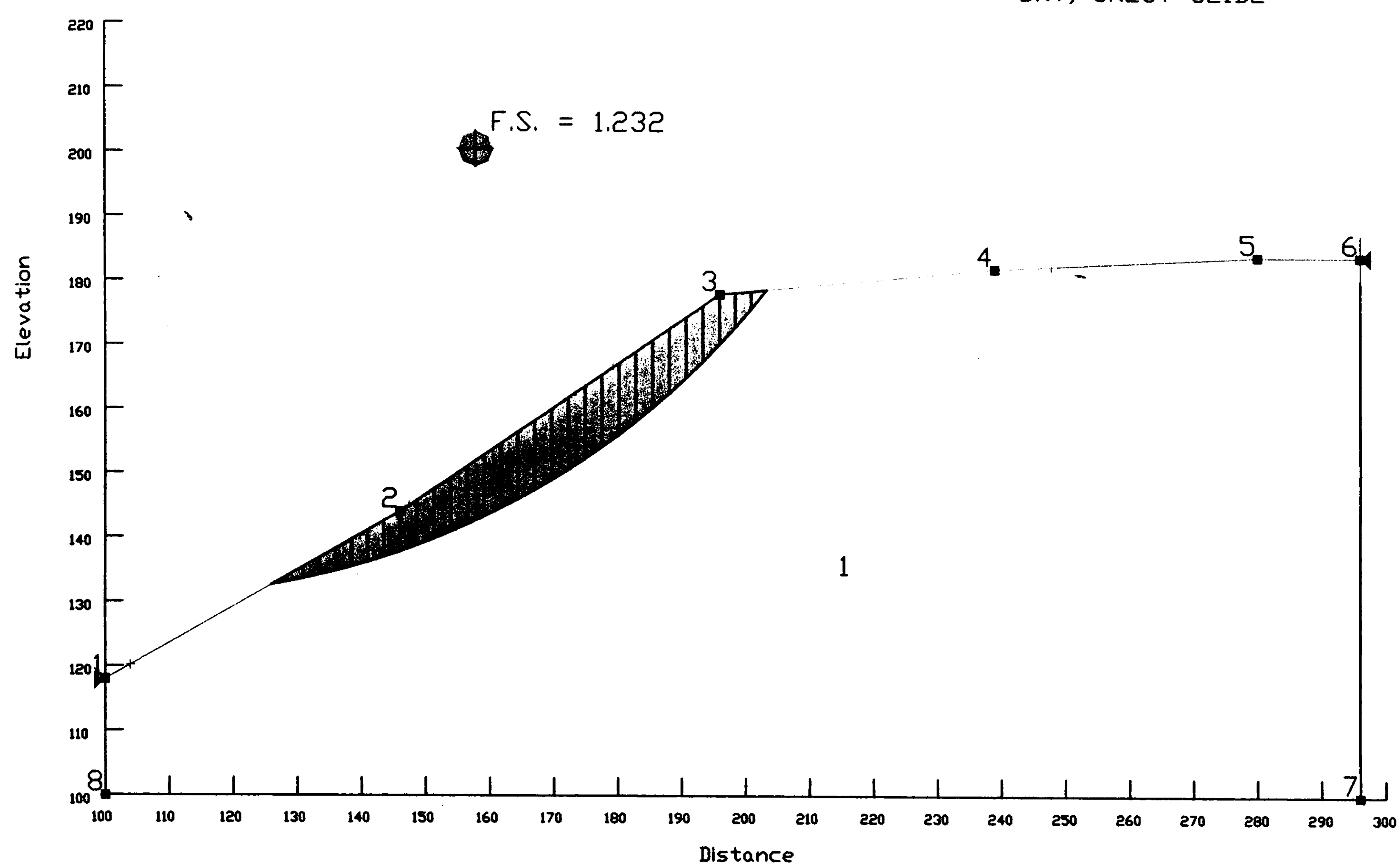
<u>FIGURE 3</u>
SECTION: A-A
CONDITIONS:
DRY, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

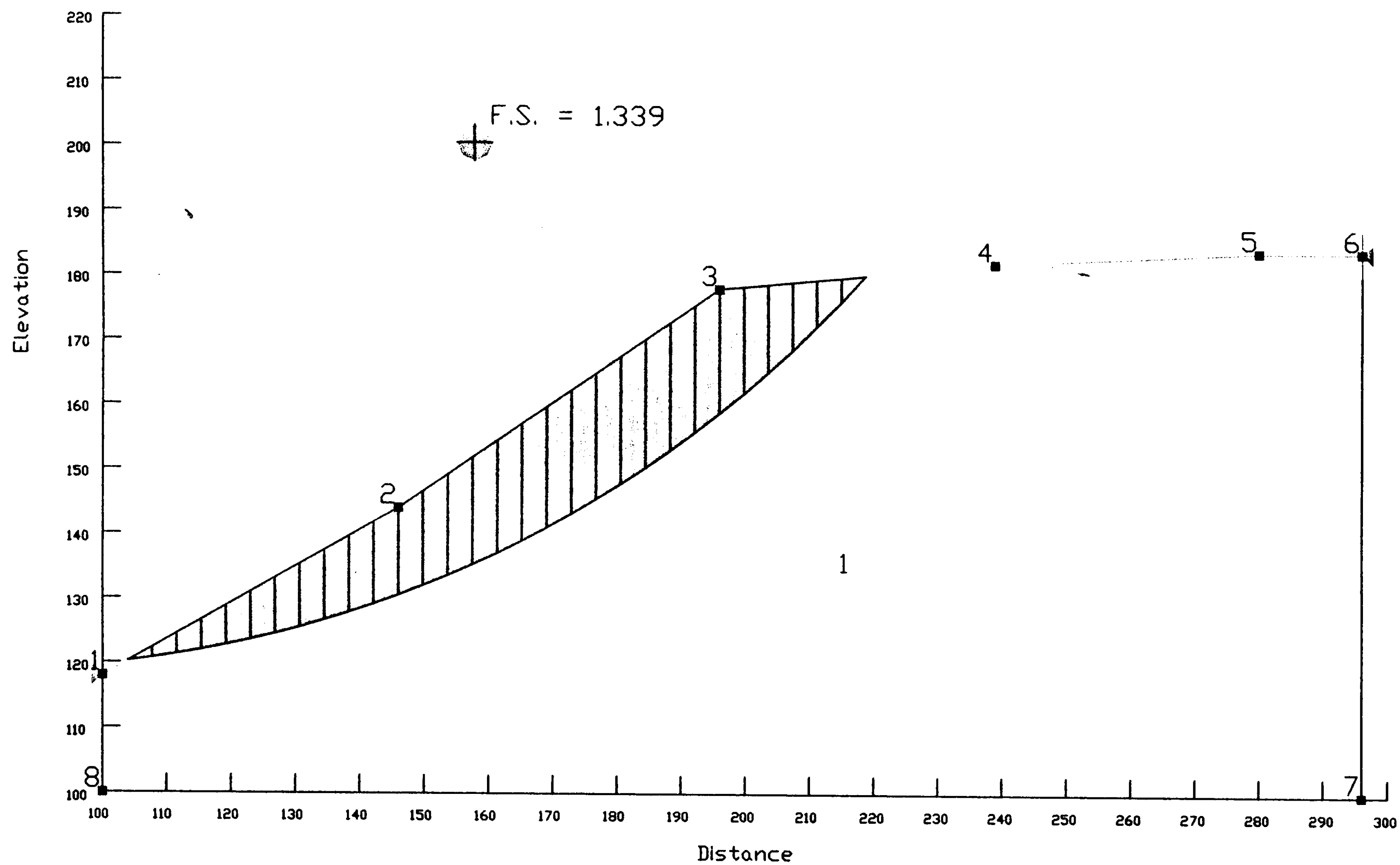
FIGURE 4
SECTION: A-A
CONDITIONS:
DRY, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

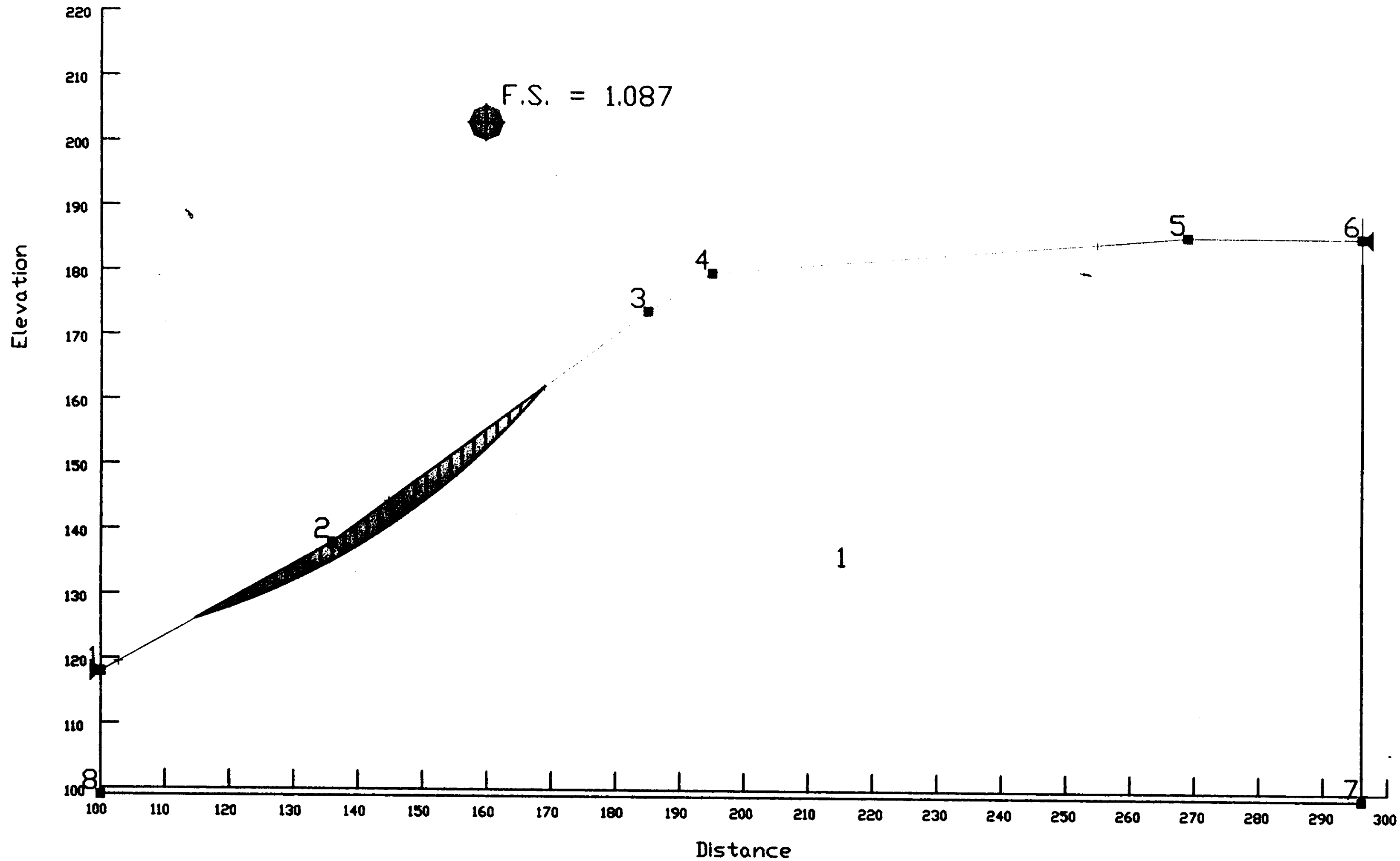
FIGURE 5
SECTION: A-A
CONDITIONS:
DRY, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

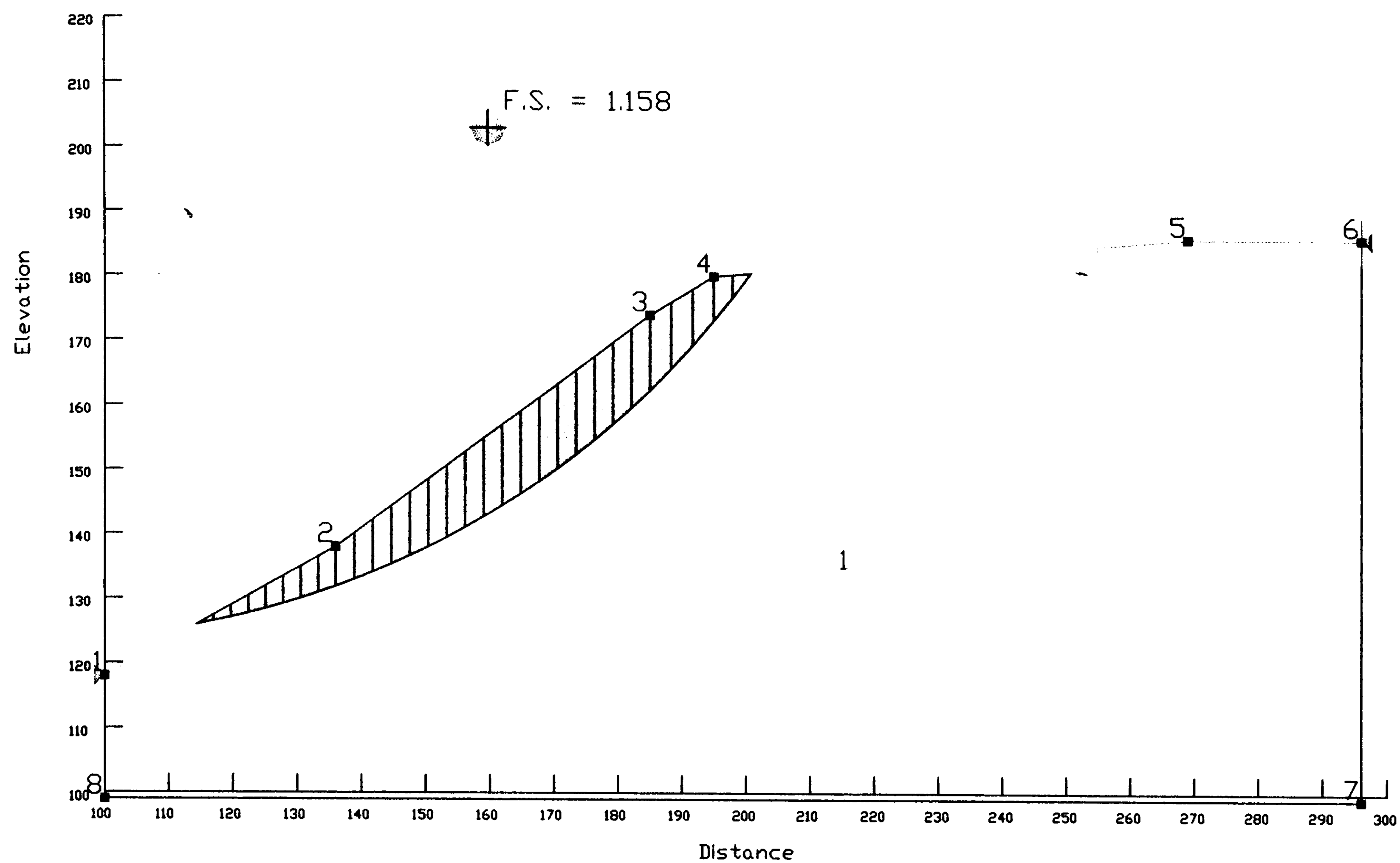
FIGURE 6
SECTION: B-B
CONDITIONS:
DRY, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

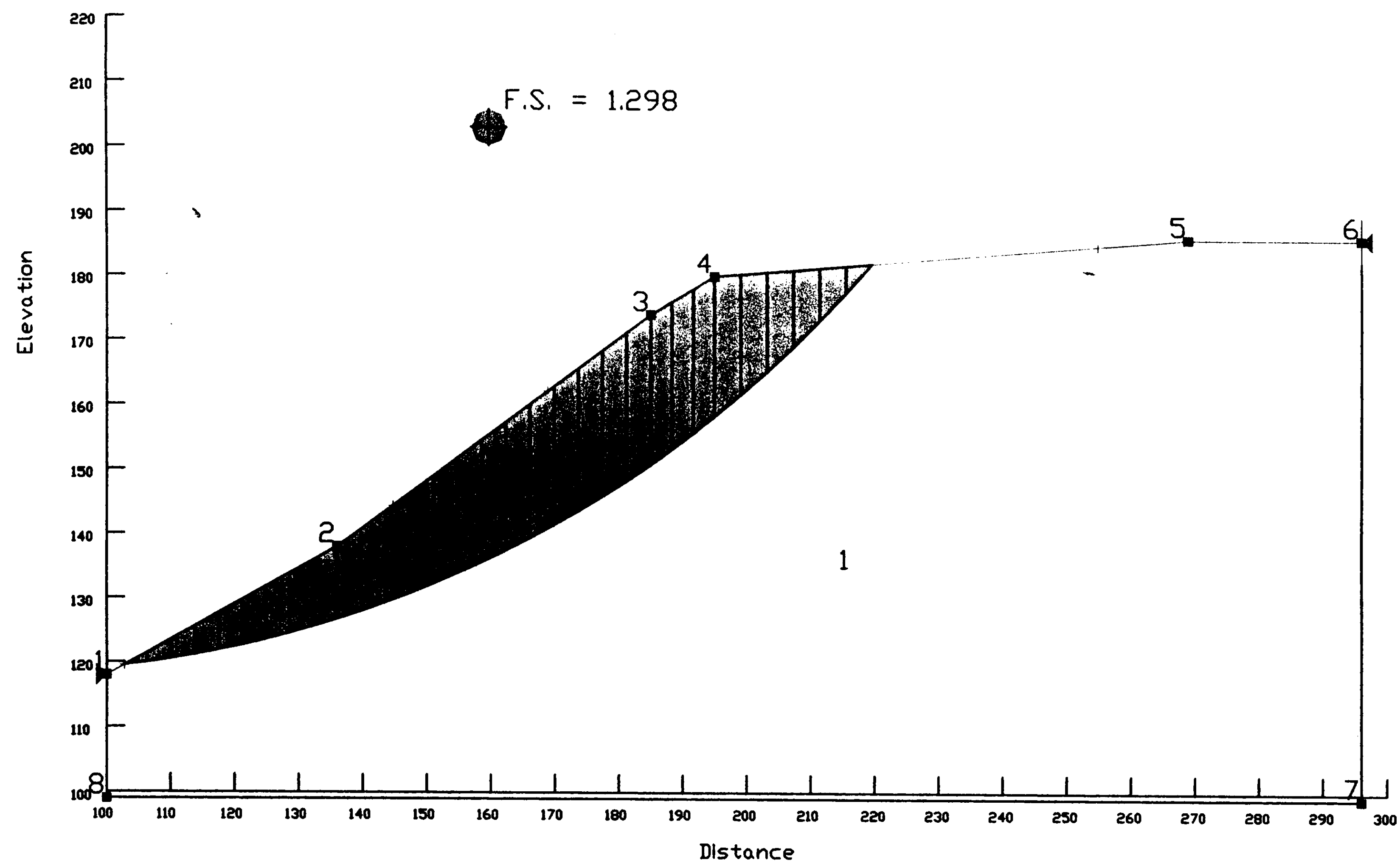
FIGURE 7
SECTION: B-B
CONDITIONS:
DRY, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

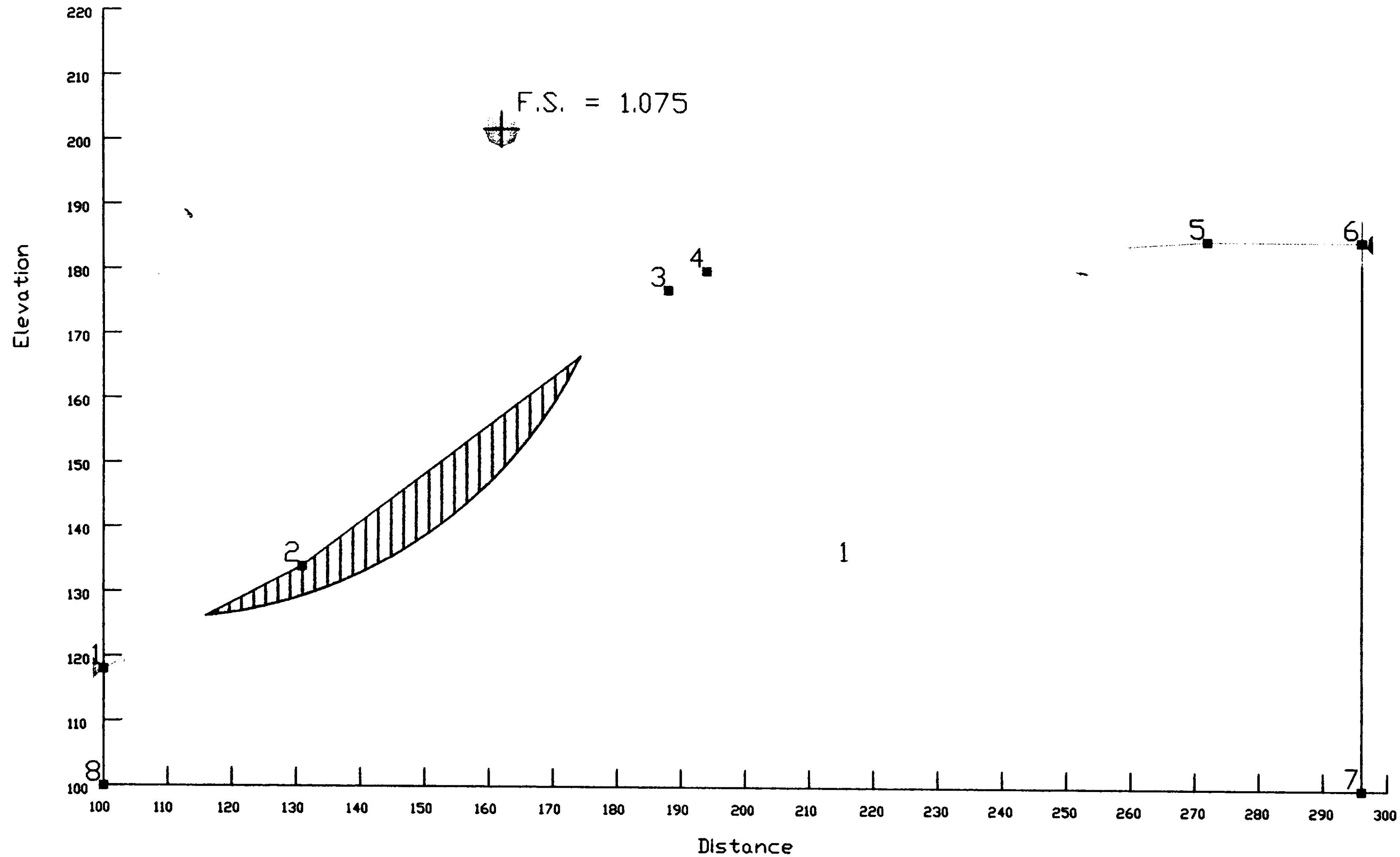
FIGURE 8
SECTION: B-B
CONDITIONS:
DRY, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

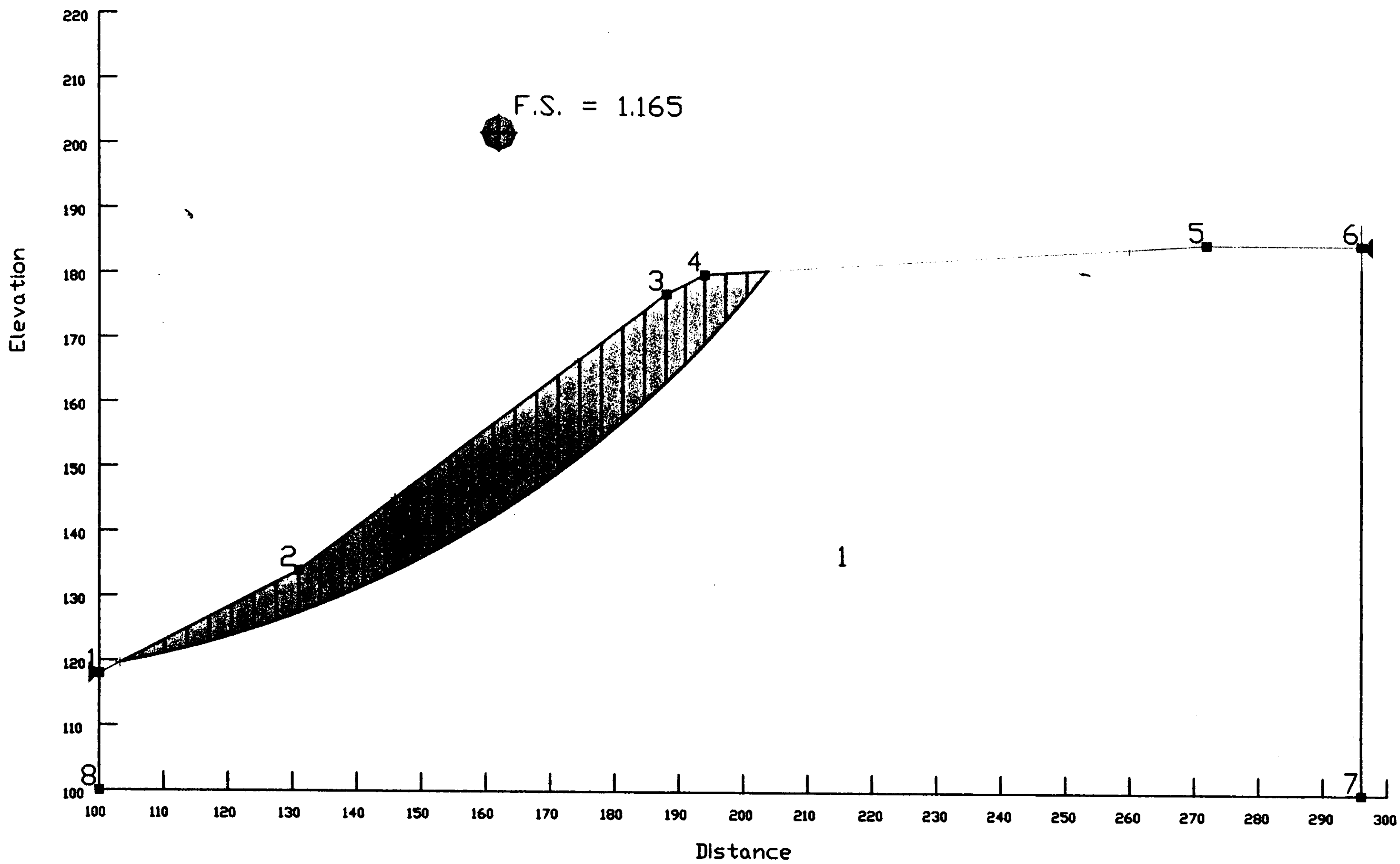
FIGURE 9
SECTION: C-C
CONDITIONS:
DRY, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

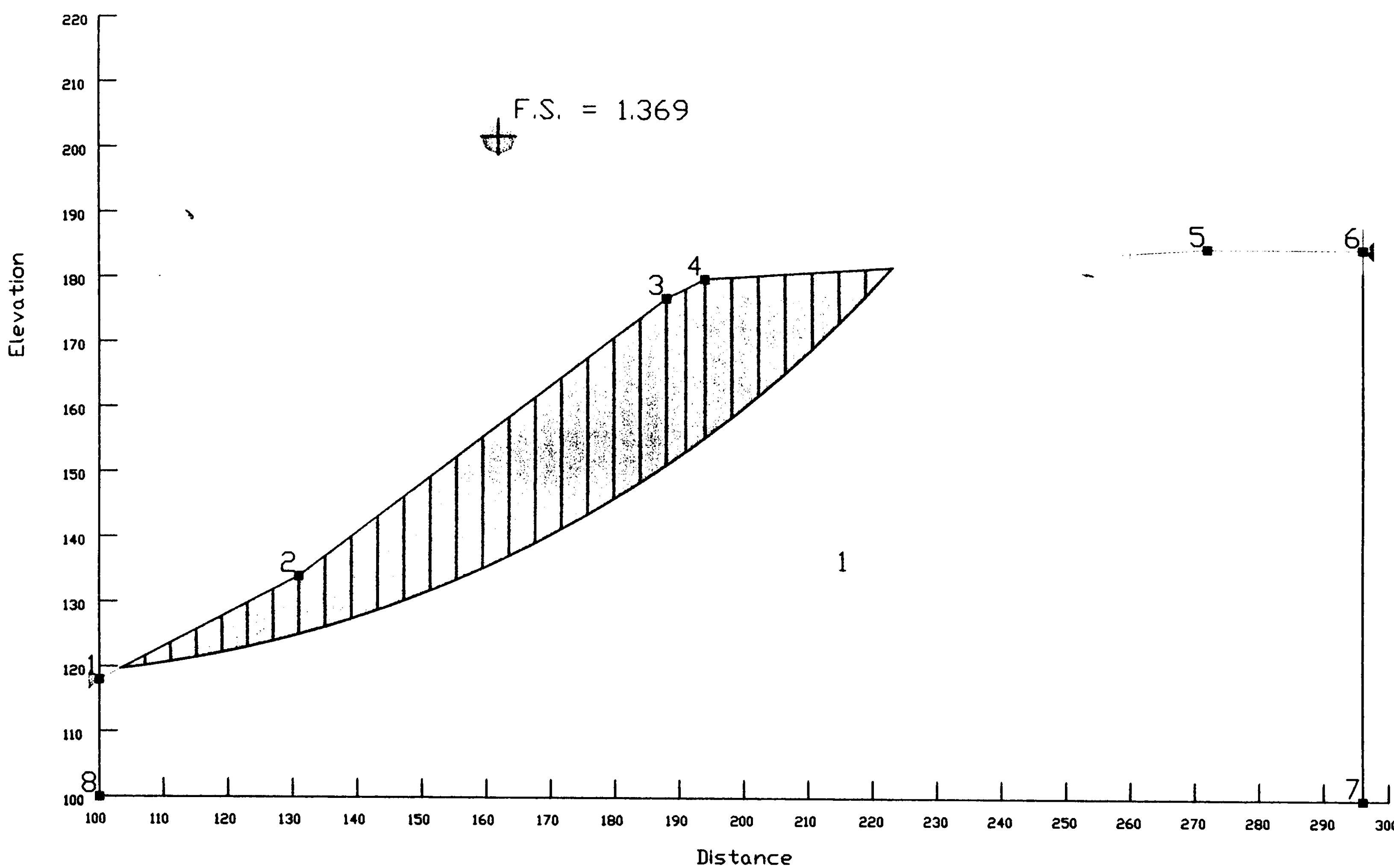
FIGURE 10
SECTION: C-C
CONDITIONS:
DRY, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

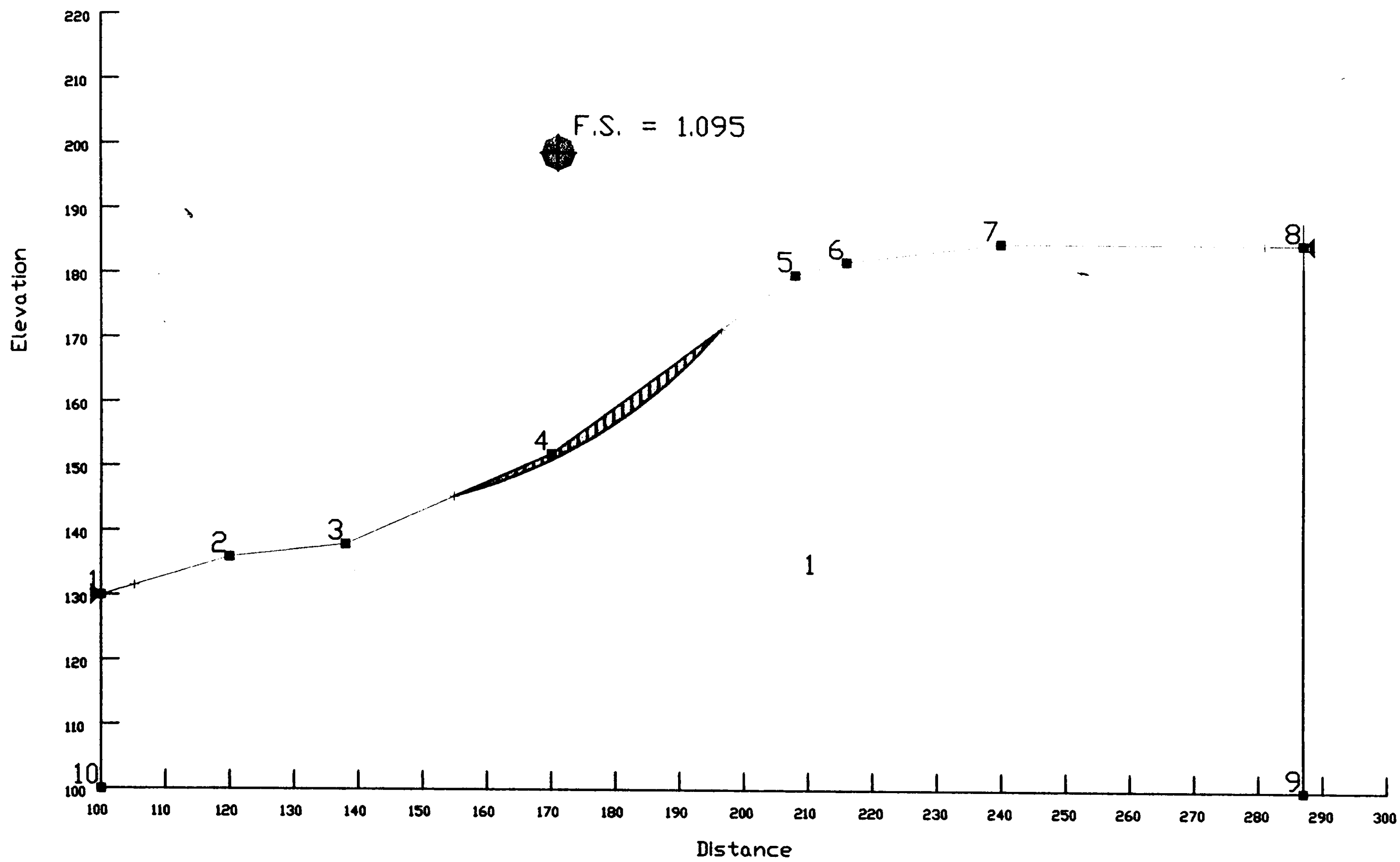
FIGURE 11
SECTION: C-C
CONDITIONS:
DRY, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

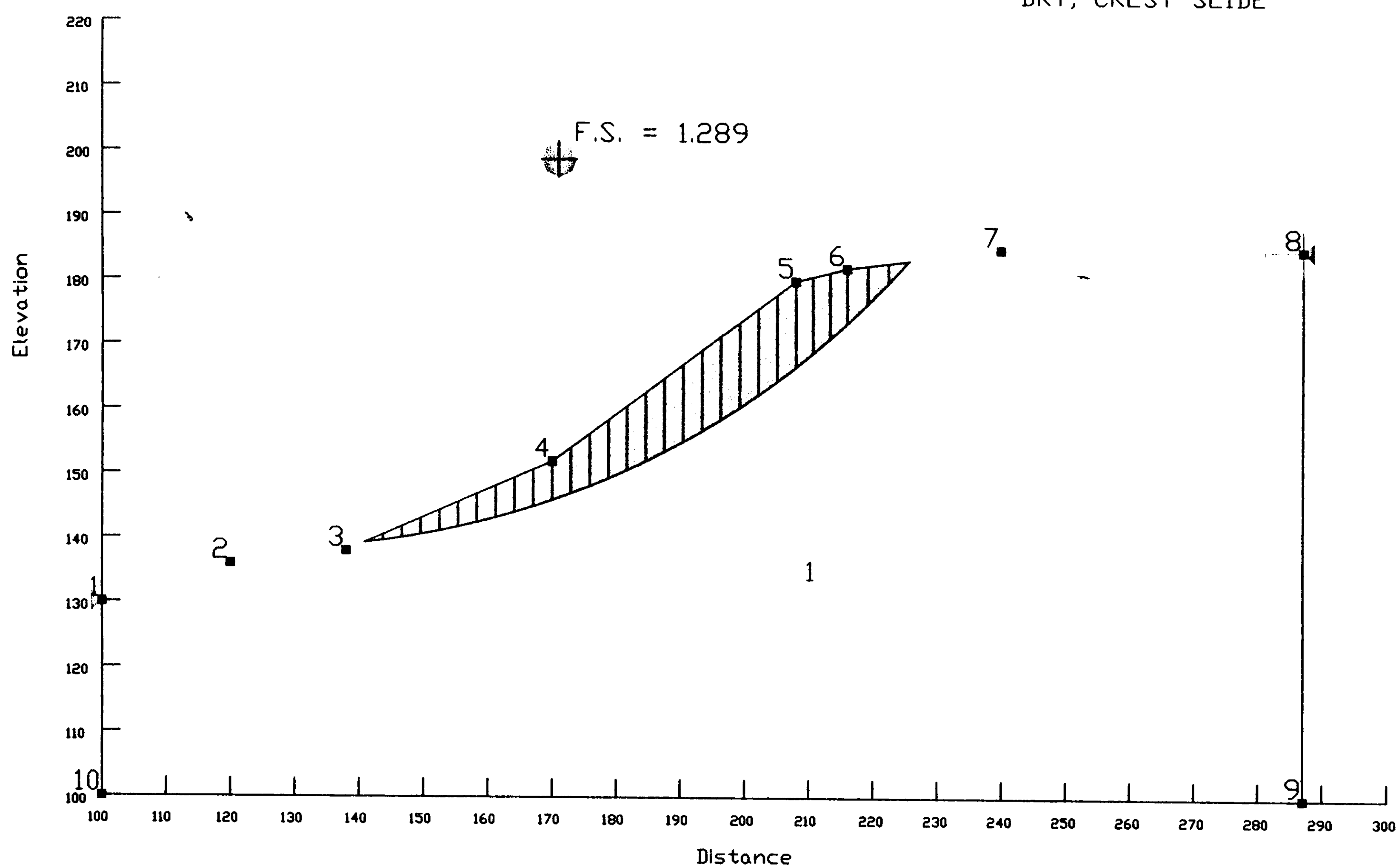
FIGURE 12
SECTION: D-D
CONDITIONS:
DRY, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

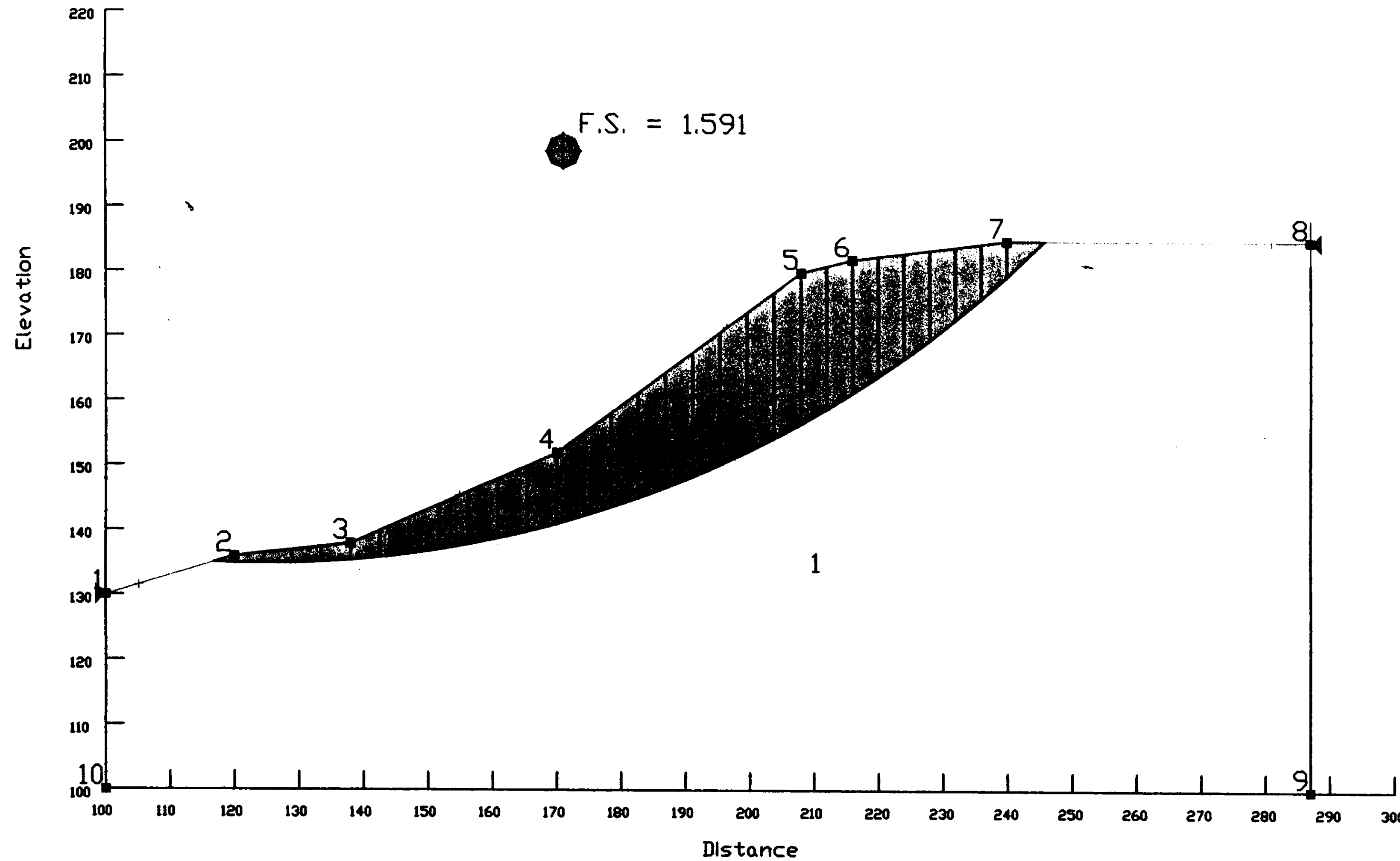
<u>FIGURE 13</u>
SECTION: D-D
CONDITIONS:
DRY, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

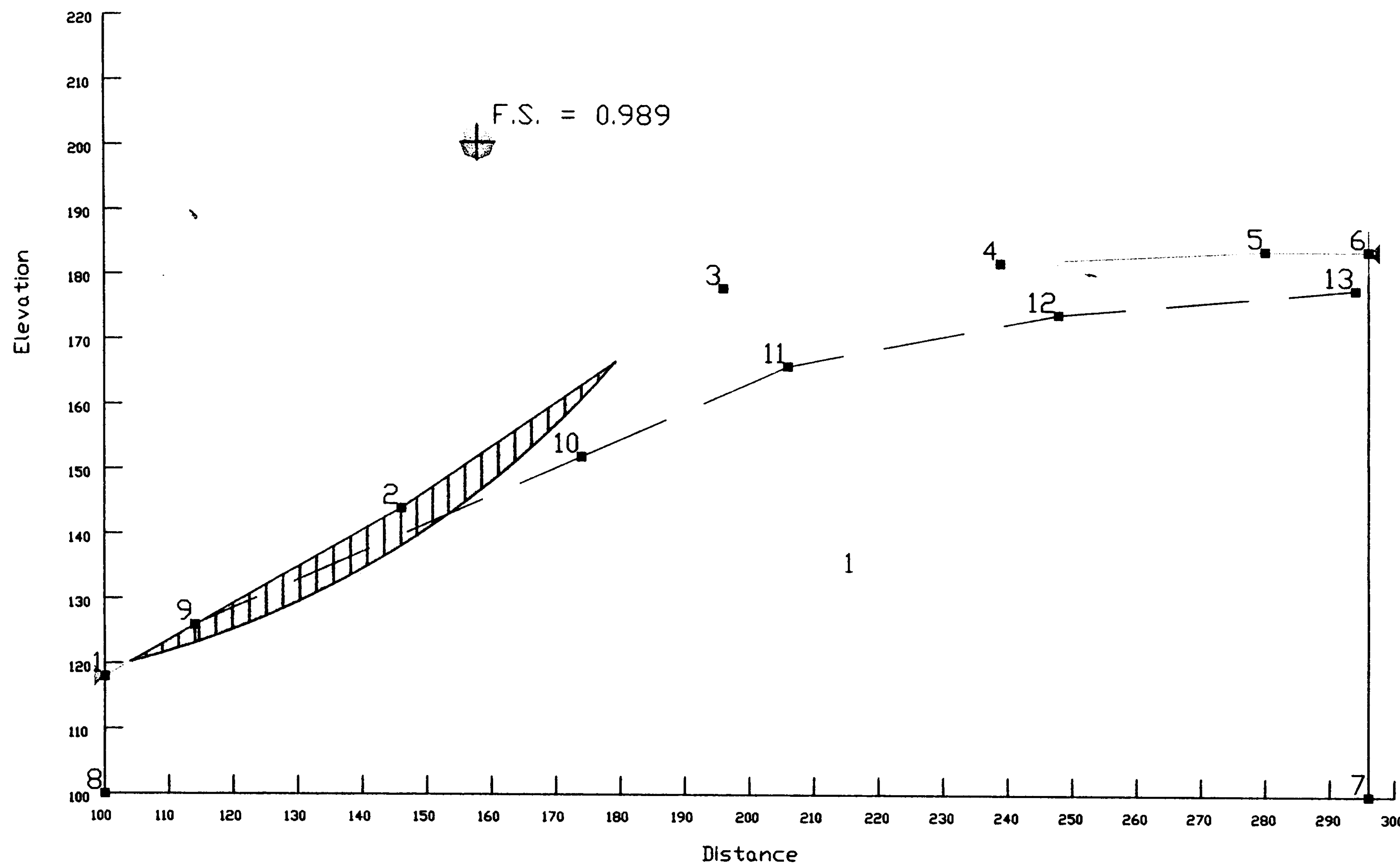
FIGURE 14
SECTION: D-D
CONDITIONS:
DRY, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

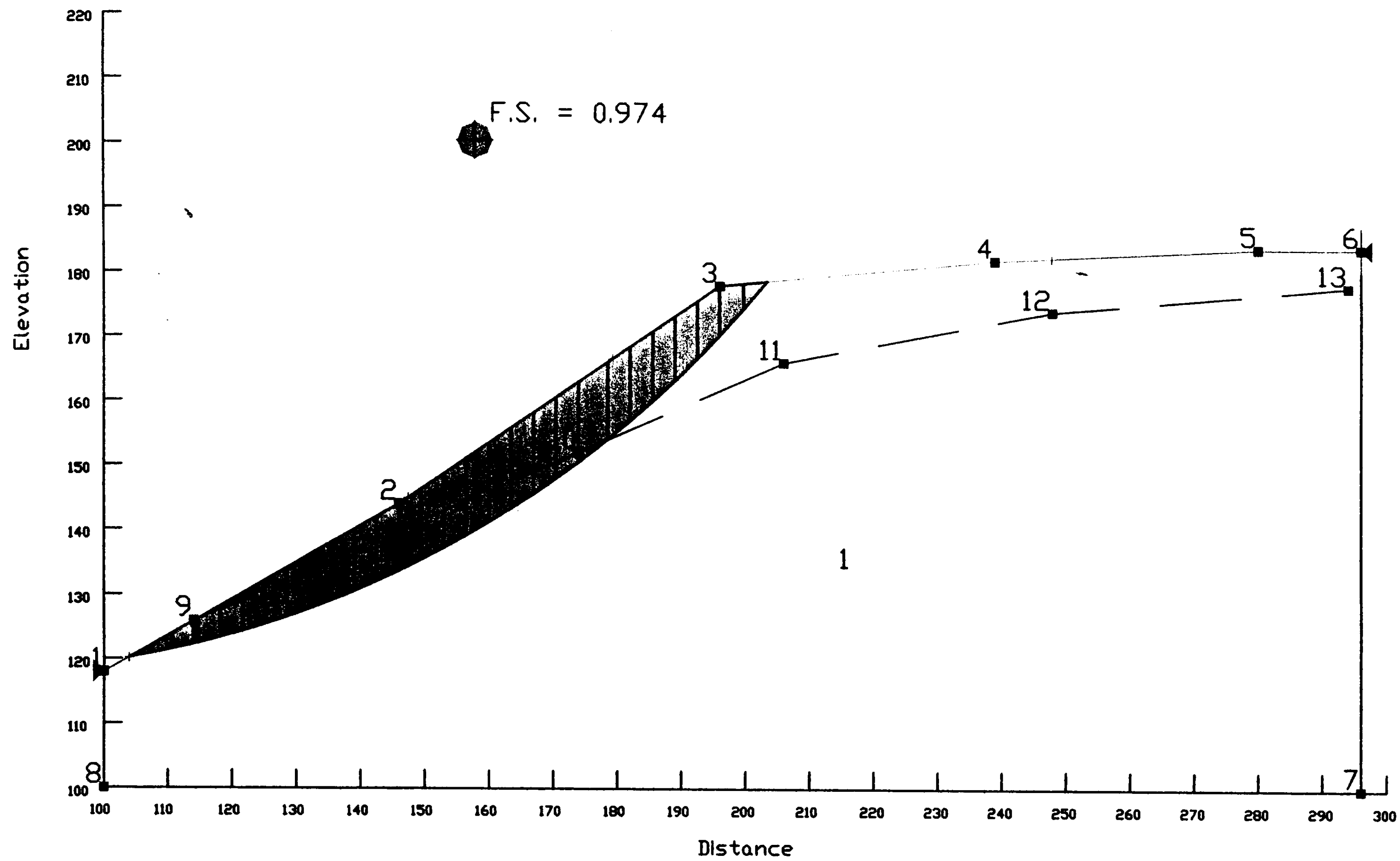
FIGURE 15
SECTION: A-A
CONDITIONS:
WET, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

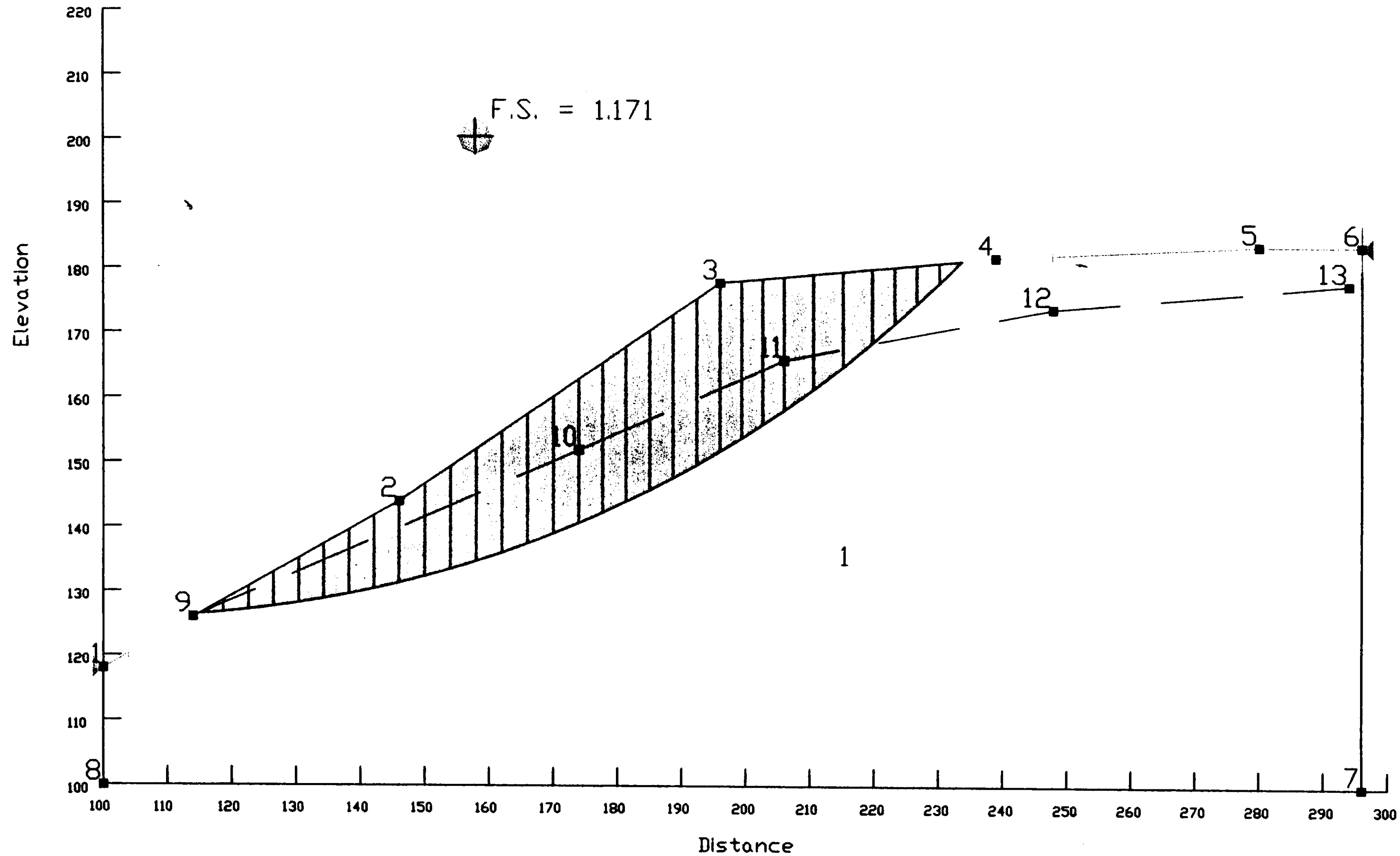
FIGURE 16
SECTION: A-A
CONDITIONS:
WET, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

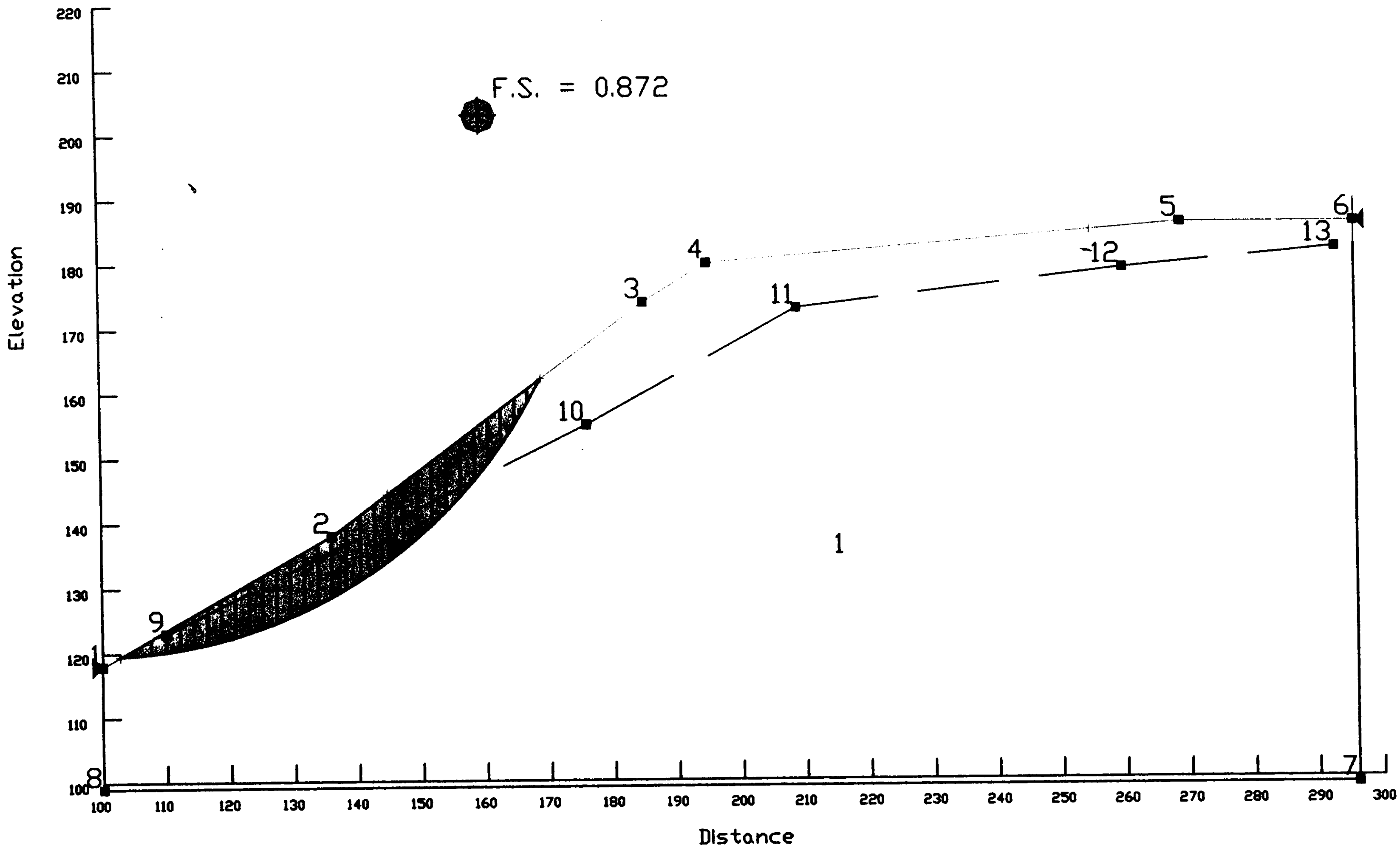
FIGURE 17
SECTION: A-A
CONDITIONS:
WET, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

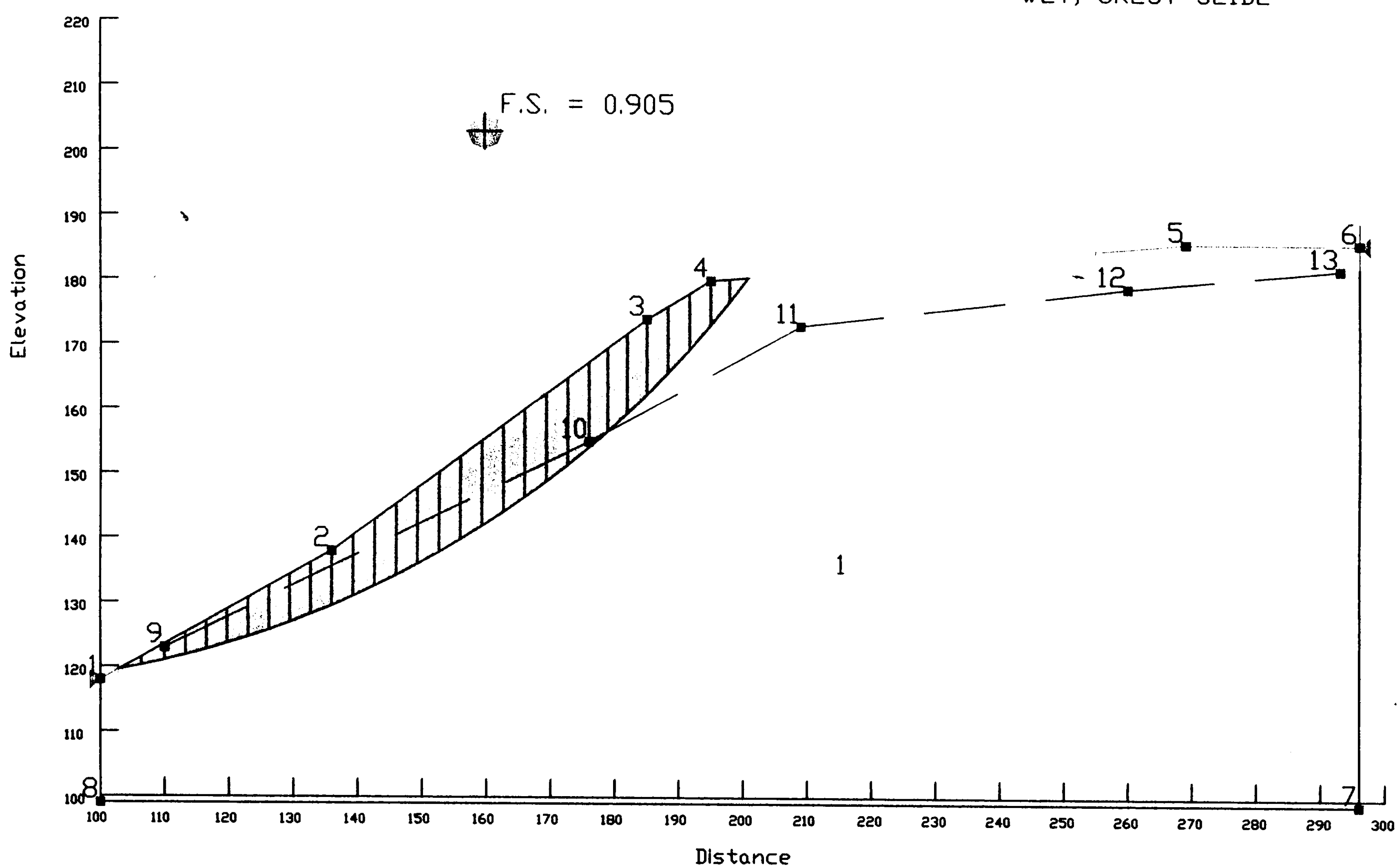
FIGURE 18
SECTION: B-B
CONDITIONS:
WET, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

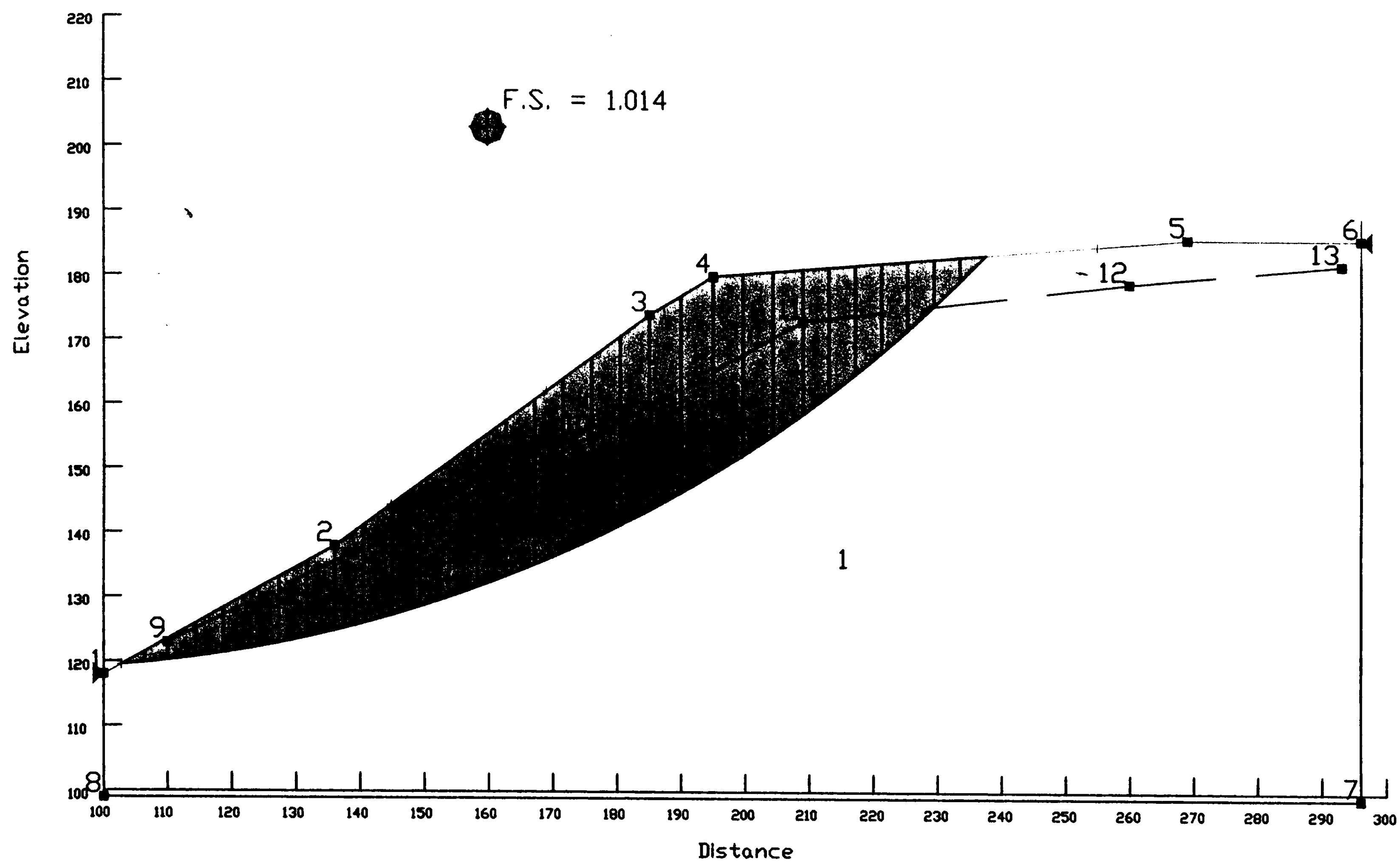
FIGURE 19
SECTION: B-B
CONDITIONS:
WET, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

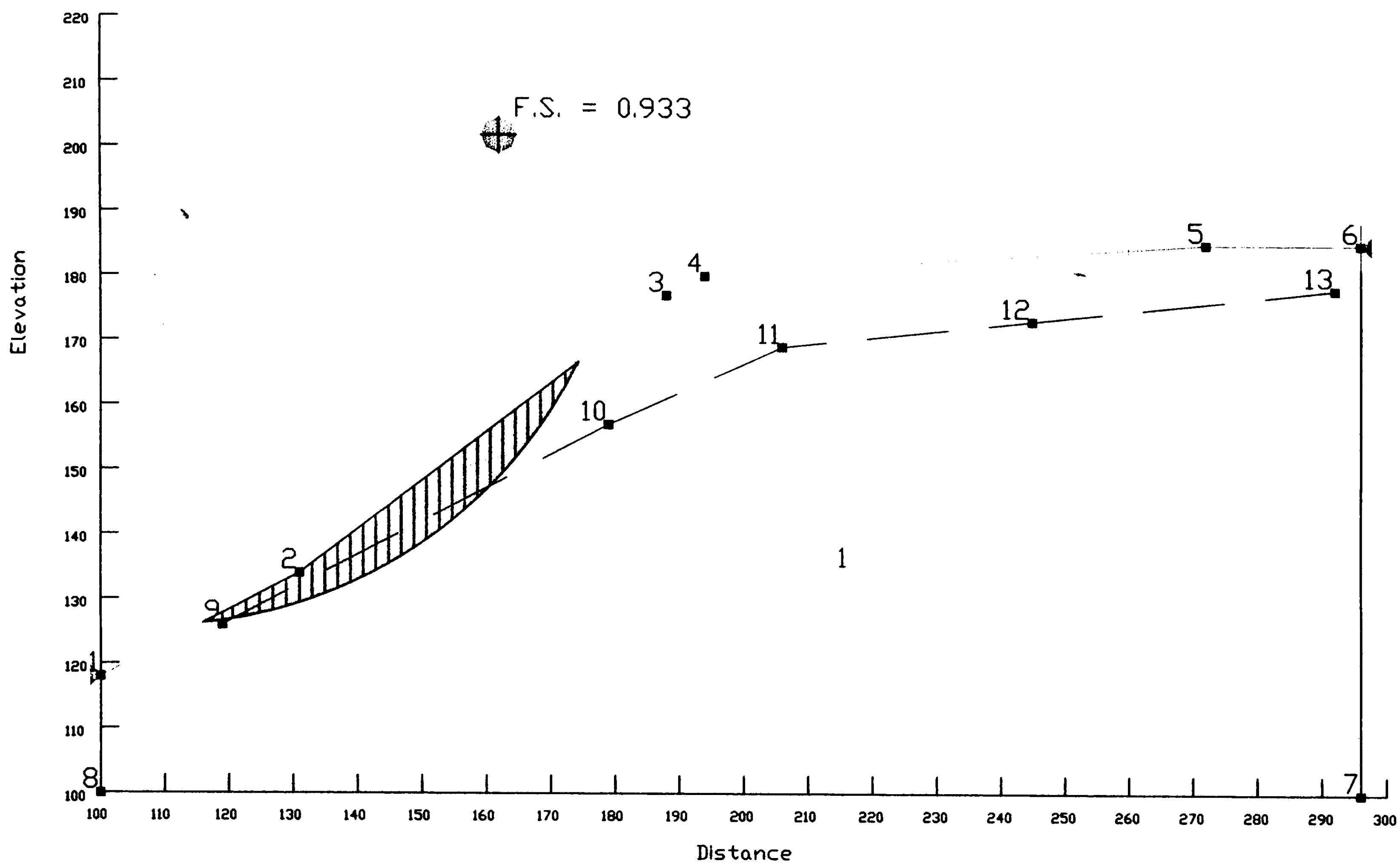
FIGURE 20
SECTION: B-B
CONDITIONS:
WET, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

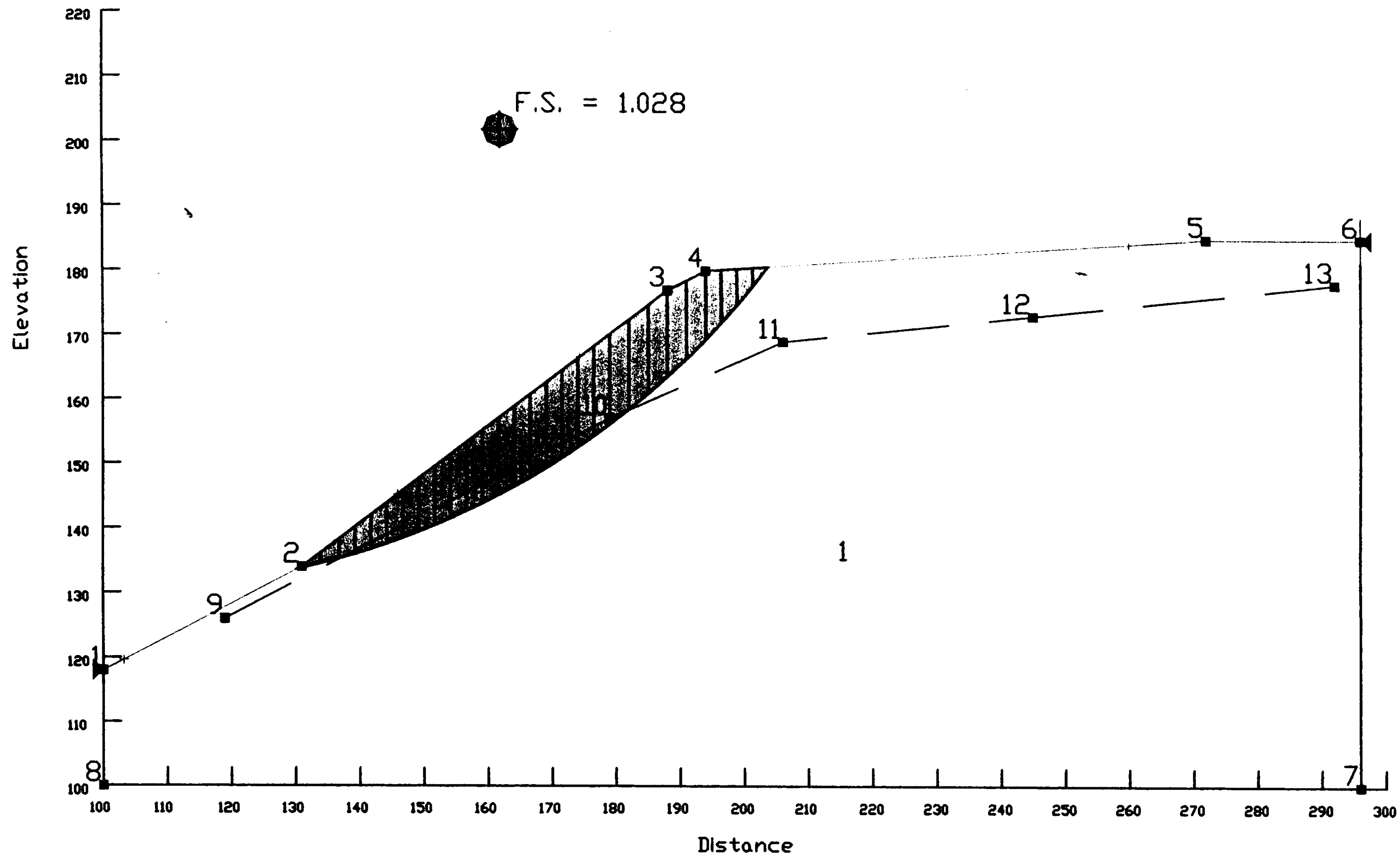
FIGURE 21
SECTION: C-C
CONDITIONS:
WET, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

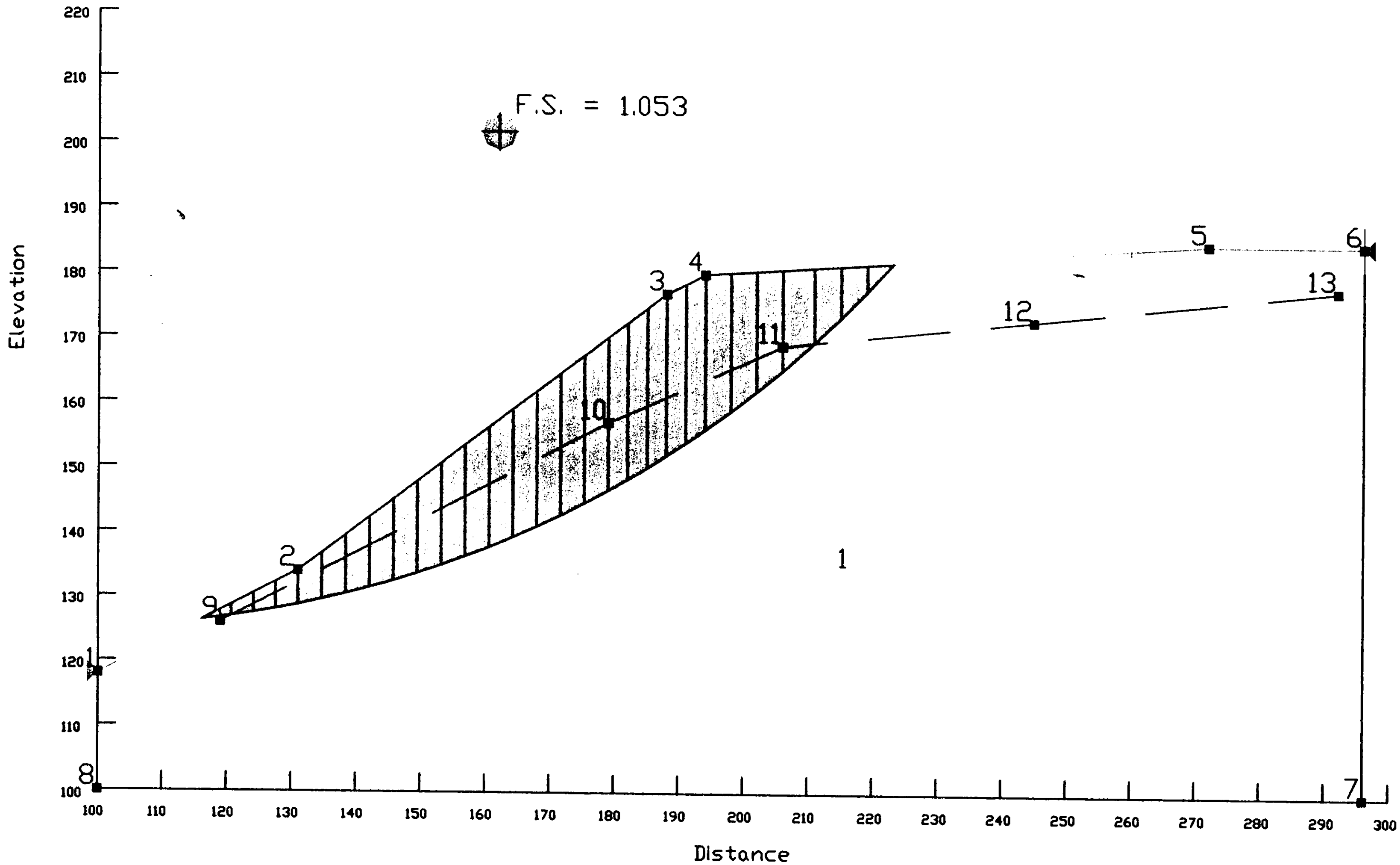
FIGURE 22
SECTION: C-C
CONDITIONS:
WET, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

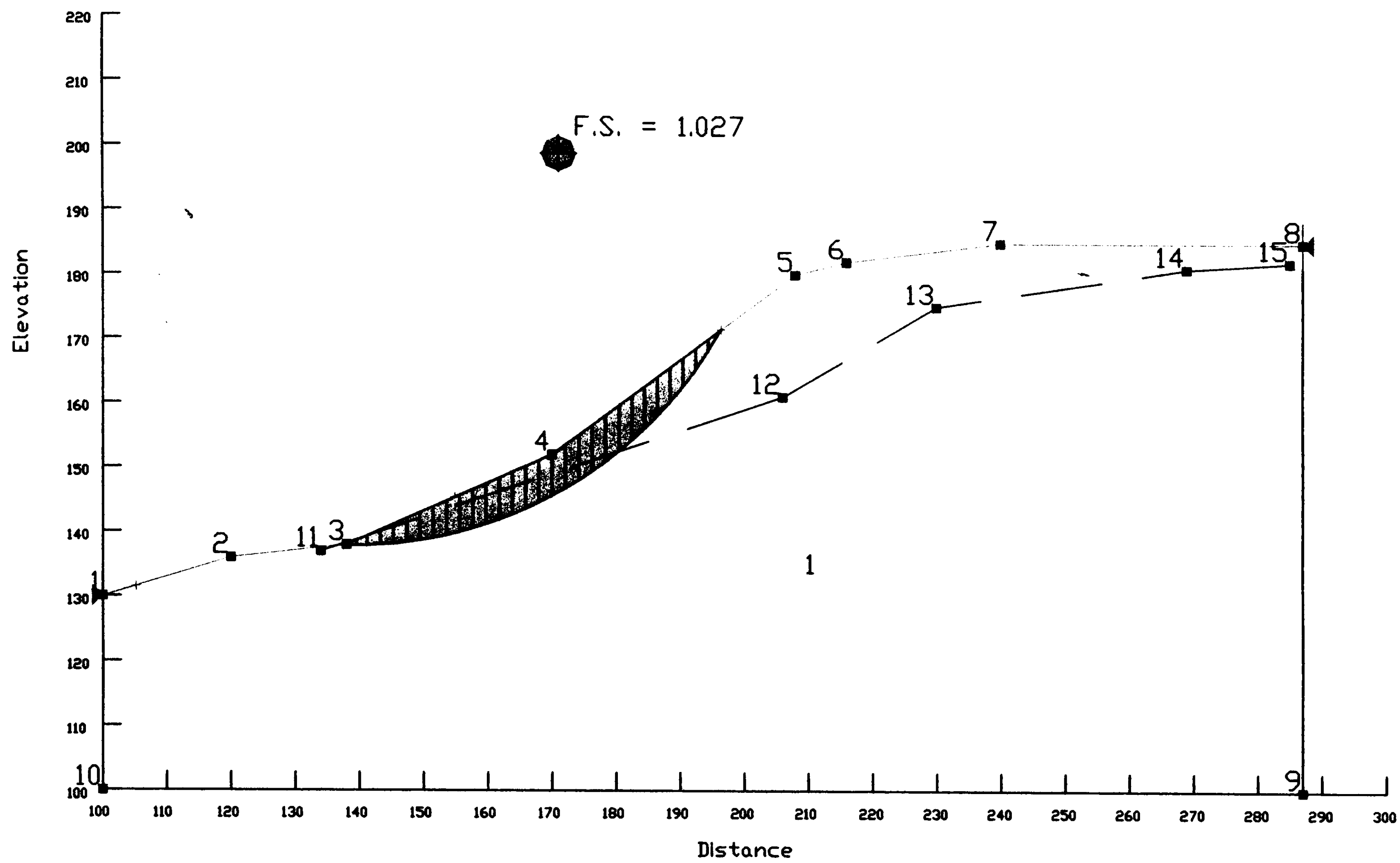
FIGURE 23
SECTION: C-C
CONDITIONS:
WET, DEEP SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

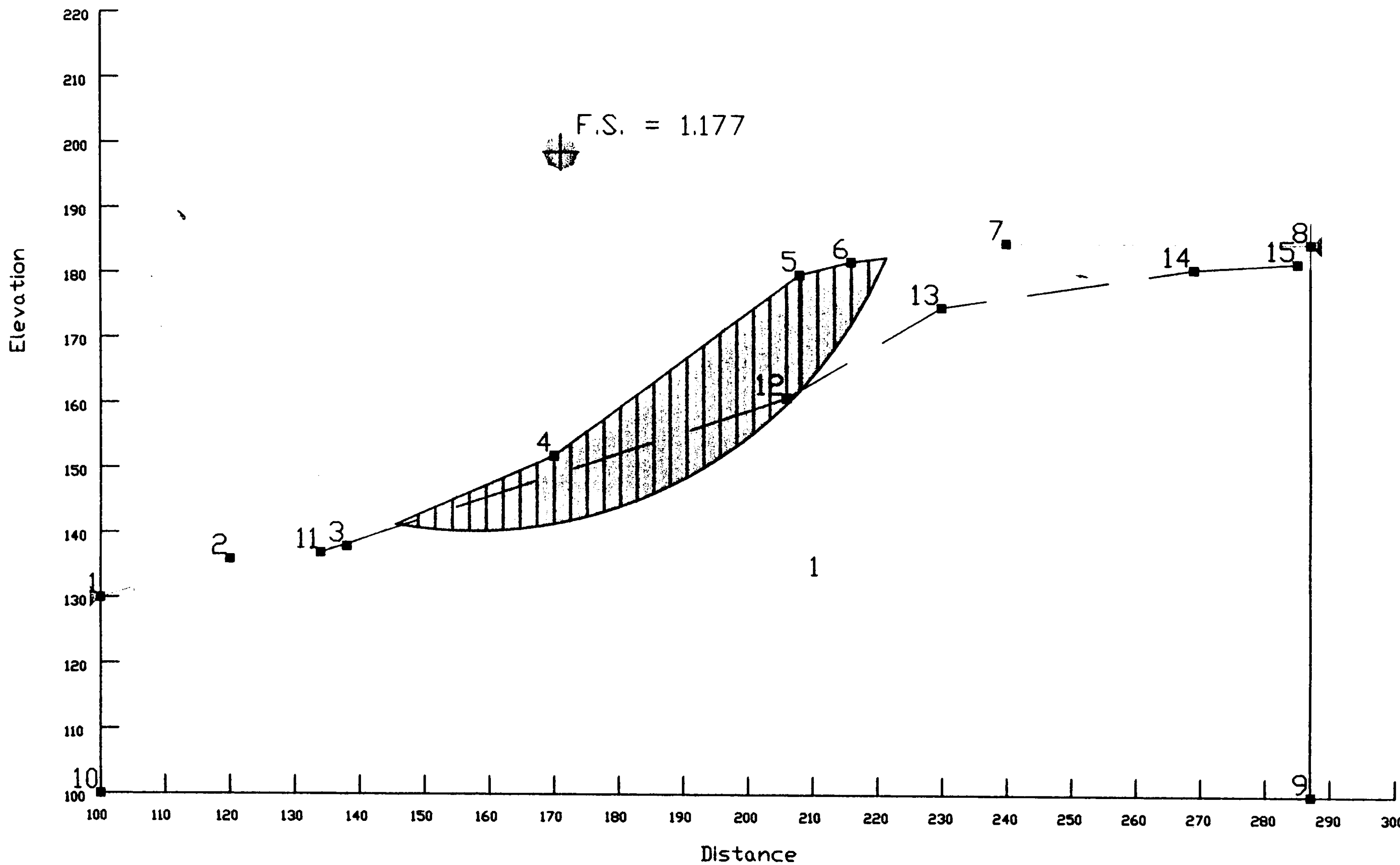
FIGURE 24
SECTION: D-D
CONDITIONS:
WET, SURFACE SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

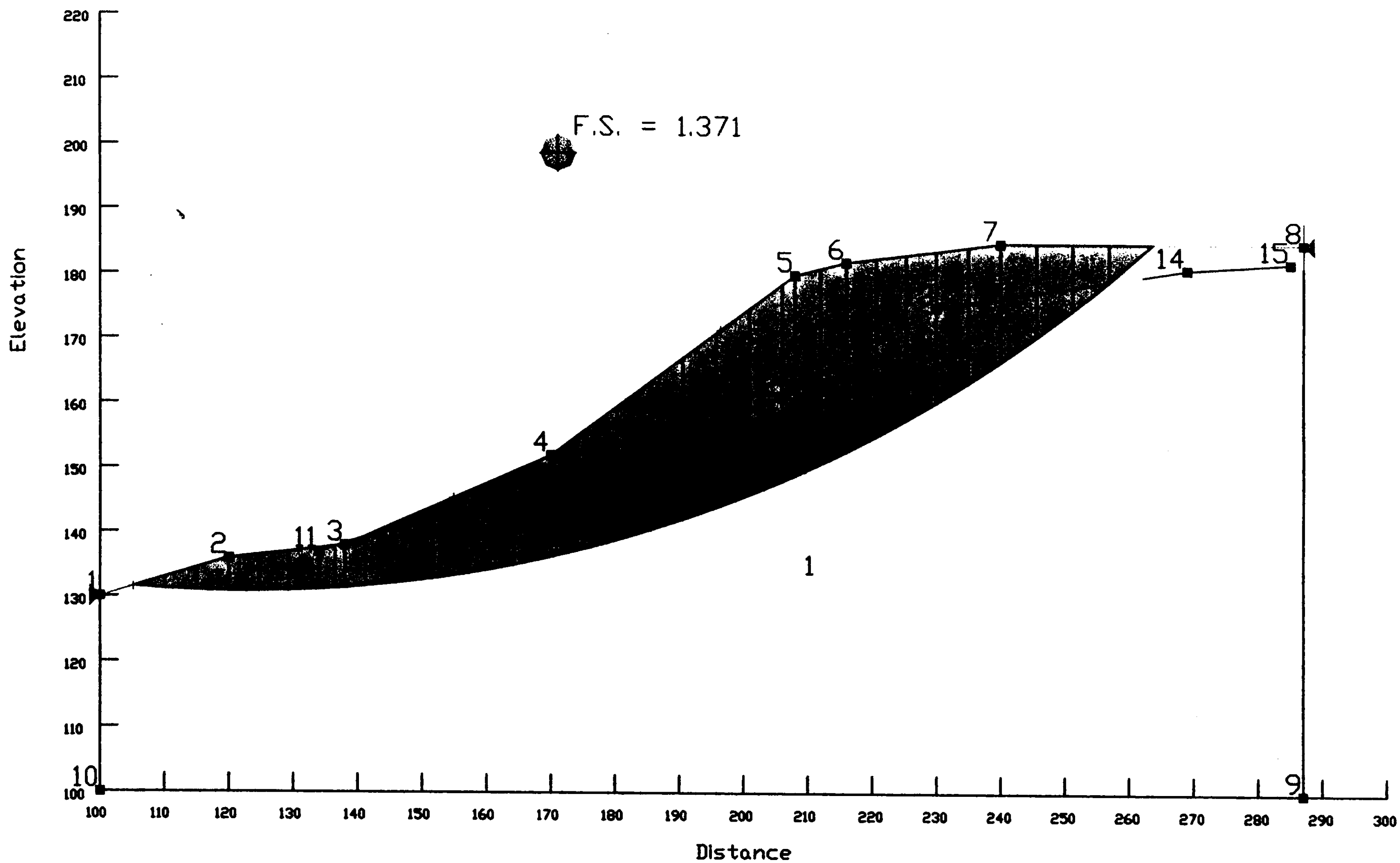
FIGURE 25
SECTION: D-D
CONDITIONS:
WET, CREST SLIDE



PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

JOB NO. 06-118

FIGURE 26
SECTION: D-D
CONDITIONS:
WET, DEEP SLIDE

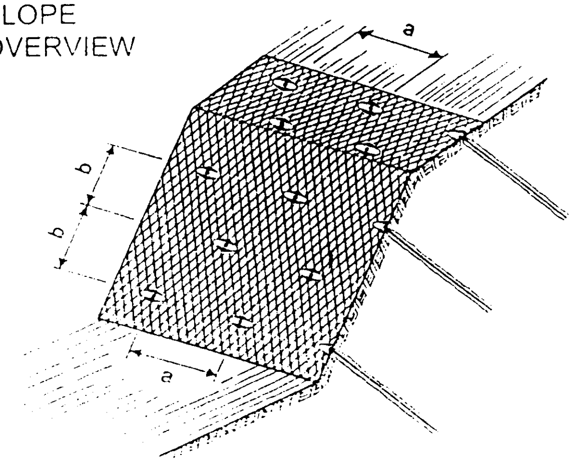


PROJECT: WATERS EDGE AT DOBBS FERRY, DOBBS FERRY, NY

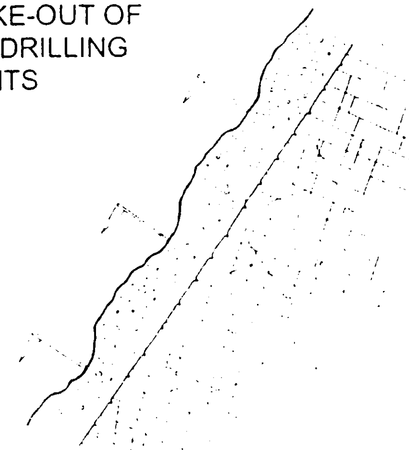
JOB NO. 06-118

THE TECCO® SYSTEM: TECHNICAL LEAFLET FOR THE INSTALLATION 1

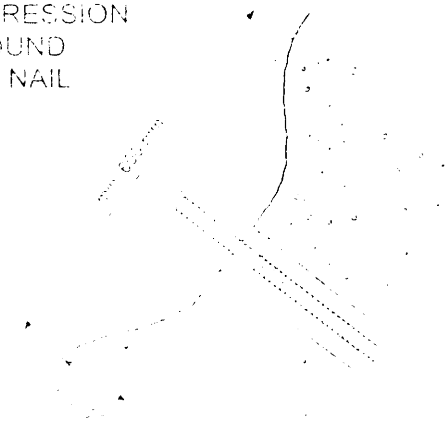
SLOPE OVERVIEW



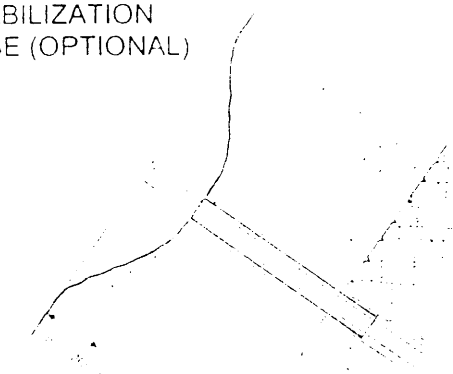
STAKE-OUT OF THE DRILLING POINTS



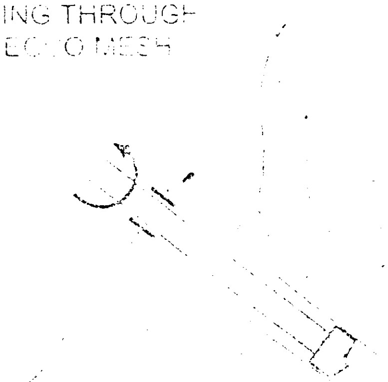
DEPRESSION AROUND THE NAIL



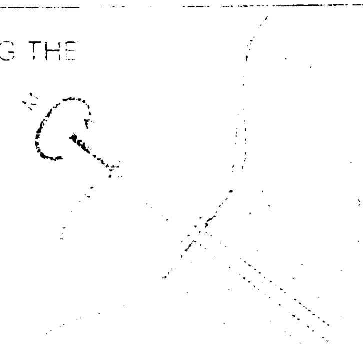
STABILIZATION TUBE (OPTIONAL)



DRILLING THROUGH THE TECCO MESH



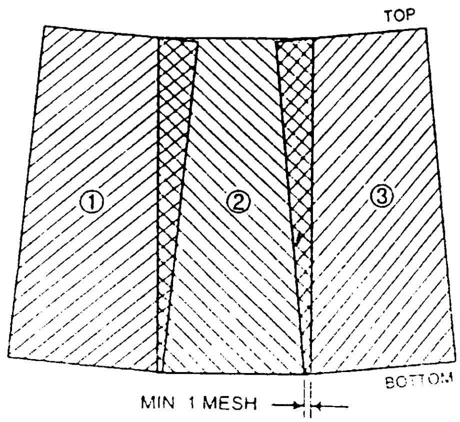
TENSIONING THE TECCO SYSTEM



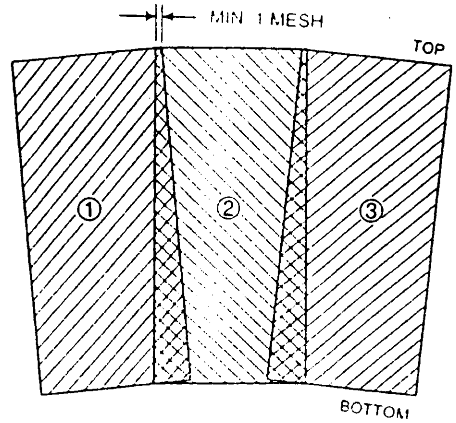
GEOBRUGG

THE TECCO® SYSTEM
TECHNICAL LEAFLET FOR THE INSTALLATION 2

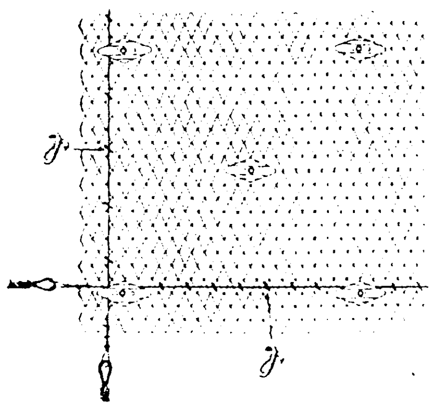
CONVEX SLOPE



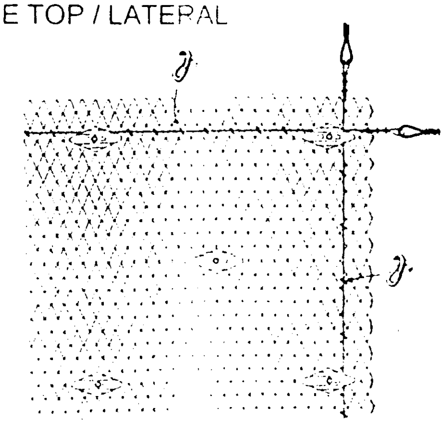
CONCAVE SLOPE



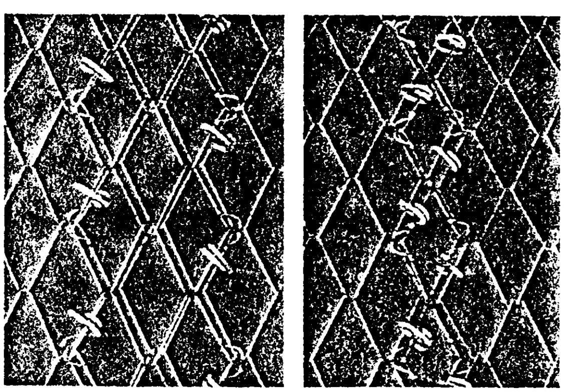
OPTIONAL BOUNDARY ROPE AT THE BOTTOM / LATERAL



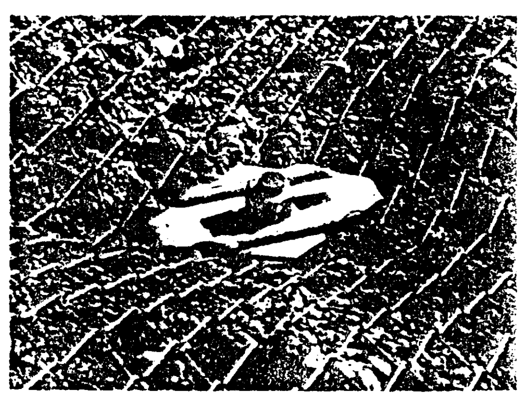
OPTIONAL BOUNDARY ROPE AT THE TOP / LATERAL



VERTICAL CONNECTION OF THE MESH SHEETS



THE FINISHED TECCO® SYSTEM LAYED AND TENSIONED



APPENDIX

Limitations

A. USE OF REPORT BY PRESPECTIVE BIDDERS

This soil and foundation engineering report was prepared for the referenced project by Carlin-Simpson & Associates for design purposes only, and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the understanding that our scope is limited to design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations they deem necessary to prepare their bid accurately.

B. APPLICABILITY OF REPORT

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of JSF Development, LLC for the specific application for the design of the proposed structure. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only, and it should not be used as the technical specifications for the earth work, as it was prepared for design purposes exclusively.

C. REINTERPRETATION OF RECOMMENDATIONS

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the structure are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The analyses and recommendations submitted in this report are based in part upon the data obtained from test explorations performed for this study. The nature and extent of variations between the test explorations may not become evident until construction. If subsurface soil, rock or groundwater variations appear during construction, it will be necessary to re-evaluate the recommendations of this report.

Changes in State-of-the-Art: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. SUBSURFACE INFORMATION

Locations: The location of each test exploration was established in the field by measurement from some known building or topographic feature shown on site plans provided to our office. The ground surface elevations of the explorations were determined from the topographic survey supplied to this office. The locations and elevations of the test explorations should be considered approximated.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface test explorations represent the approximate boundary between soil types, and the transition may be gradual.

Field Logs/Final Log: A field log was prepared for each test exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples.

Our recommendations are based on the final logs and the information contained therein, and not on the field logs.

The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples. The final logs are included in this engineering report

Standard method of Sampling: All subsurface explorations proceed to a depth based on soil type and structure and proposed construction. Sampling is performed typically at changes in soil conditions so as to provide a representative view of subsurface conditions.

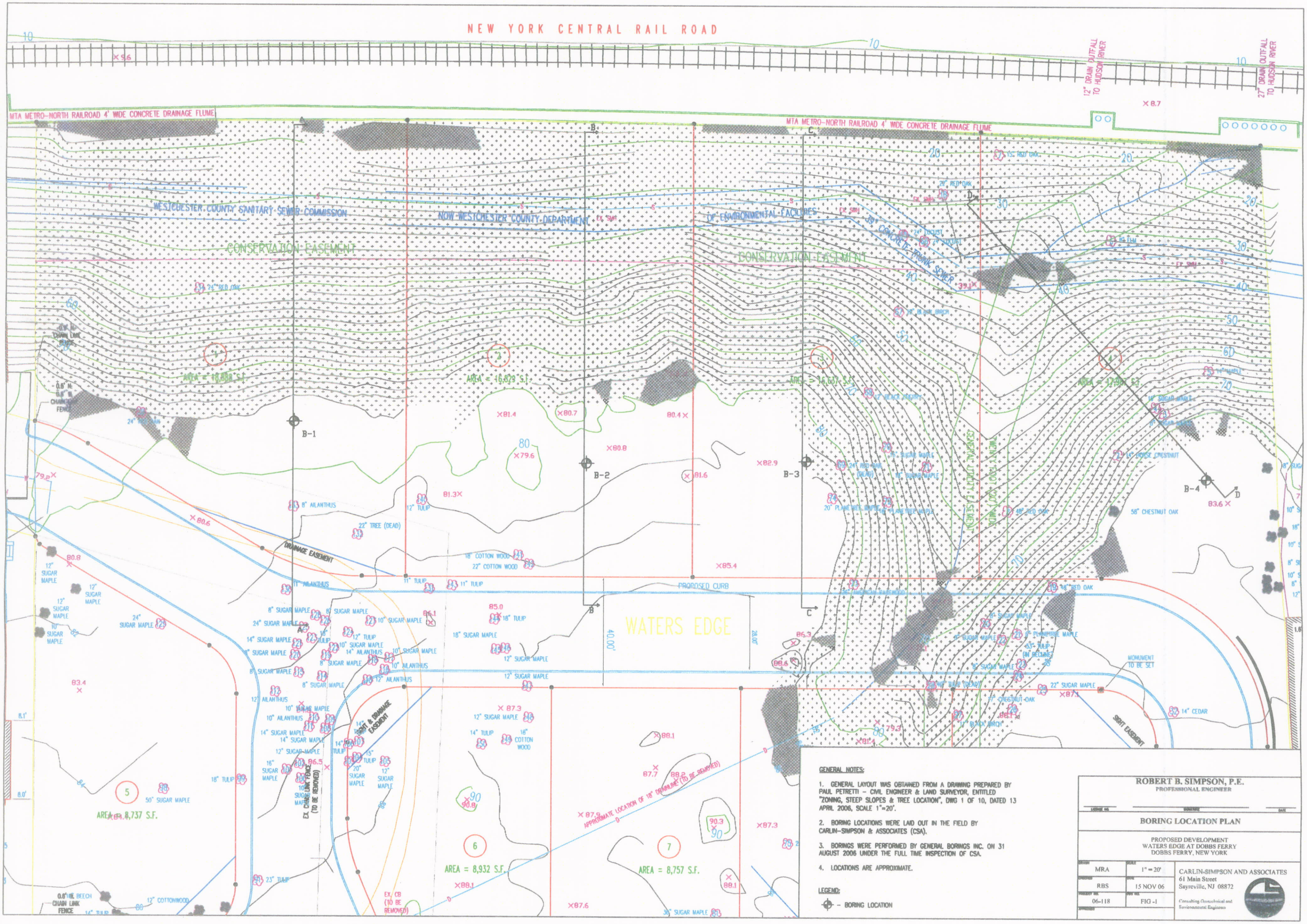
Water Levels: Water level observations in each test exploration were made for the conditions and times stated on the individual logs. This data was reviewed and interpretations were made for the preparation of this report. It must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, and other meteorological factors.

Pollution/Contamination: Unless specifically indicated in this report, the scope of our services was limited only to the investigation and the evaluation of the geotechnical engineering aspects of the subsurface soil and groundwater conditions at the referenced site. This report does not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. unless specifically identified in this report.

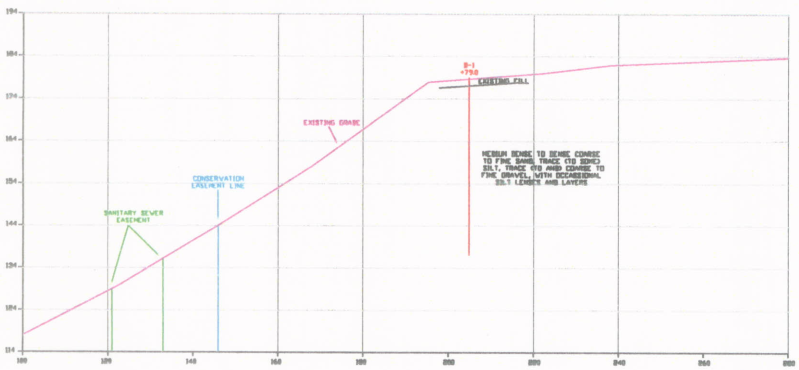
Environmental Considerations: Unless specifically indicated in the text of this report, this report does not address environmental considerations which may affect the site development, e.g. wetlands determinations, flora and fauna, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be addressed in the overall site planning.

E. CONSTRUCTION OBSERVATIONS

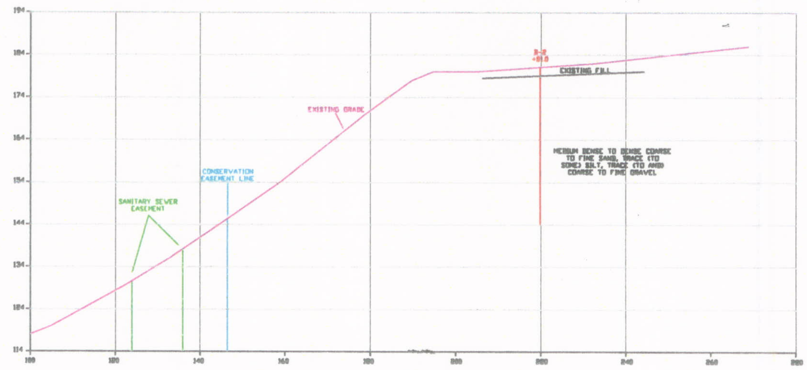
We recommend that Carlin-Simpson & Associates be retained to provide continuous on-site soils engineering services during the earthwork construction and foundation phases of the planned construction. This is to assure that the work is completed in compliance with the design concepts and to allow for design changes in the event that subsurface conditions differ from those anticipated during the planned construction.



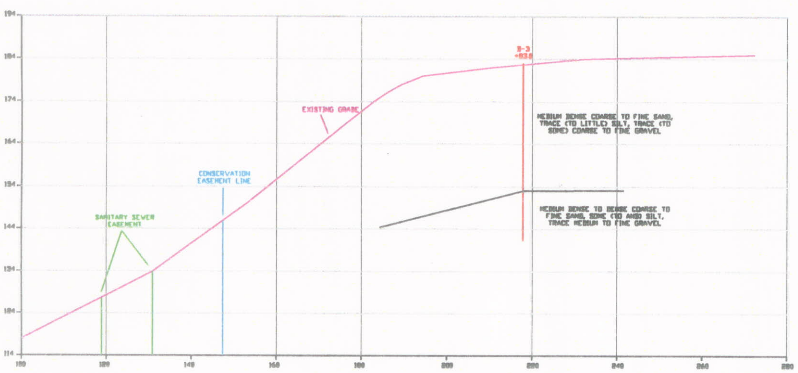
NEW YORK CENTRAL RAIL ROAD
MTA METRO-NORTH RAILROAD 4' WIDE CONCRETE DRAINAGE FLUME
12" DRAIN OUTFALL TO HUDSON RIVER
27" DRAIN OUTFALL TO HUDSON RIVER
WESTCHESTER COUNTY SANITARY SEWER COMMISSION
NOW WESTCHESTER COUNTY DEPARTMENT OF ENVIRONMENTAL FACILITIES
CONSERVATION EASEMENT
CONCRETE TRUNK SEWER
TWENTY FOOT (20') WIDE GENERAL UTILITY EASEMENT
AREA = 16,029 S.F.
AREA = 8,737 S.F.
AREA = 8,932 S.F.
AREA = 8,757 S.F.
B-1
B-2
B-3
B-4
DRAINAGE EASEMENT
SIGHT EASEMENT
SIGHT & DRAINAGE EASEMENT
PROPOSED CURB
WATERS EDGE
40.00'
28.00'
MONUMENT TO BE SET
EX. CHAIN LINK FENCE (TO BE REMOVED)
EX. CB (TO BE REMOVED)
APPROXIMATE LOCATION OF 18" DRAINLINE (TO BE REMOVED)
GENERAL NOTES:
1. GENERAL LAYOUT WAS OBTAINED FROM A DRAWING PREPARED BY PAUL PETRETTI - CIVIL ENGINEER & LAND SURVEYOR, ENTITLED "ZONING, STEEP SLOPES & TREE LOCATION", DWG 1 OF 10, DATED 13 APRIL 2006, SCALE 1"=20'.
2. BORING LOCATIONS WERE LAID OUT IN THE FIELD BY CARLIN-SIMPSON & ASSOCIATES (CSA).
3. BORINGS WERE PERFORMED BY GENERAL BORINGS INC. ON 31 AUGUST 2006 UNDER THE FULL TIME INSPECTION OF CSA.
4. LOCATIONS ARE APPROXIMATE.
LEGEND:
- BORING LOCATION
ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER
BORING LOCATION PLAN
PROPOSED DEVELOPMENT
WATERS EDGE AT DOBBS FERRY
DOBBS FERRY, NEW YORK
MRA
1" = 20'
RBS
15 NOV 06
06-118
FIG -1
CARLIN-SIMPSON AND ASSOCIATES
61 Main Street
Sayreville, NJ 08872



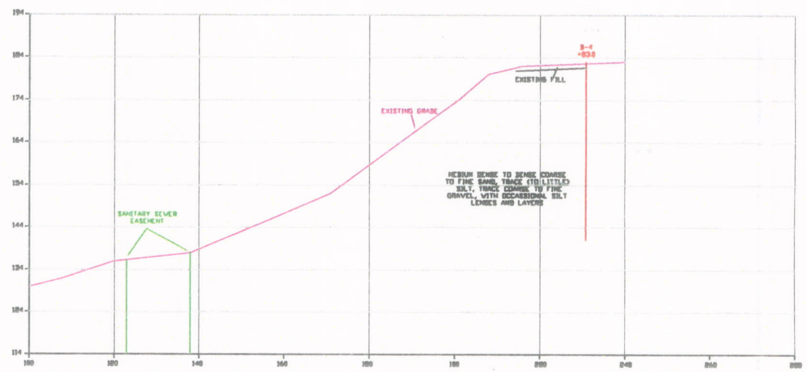
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

ROBERT B. SIMPSON, P.E.
PROFESSIONAL ENGINEER

SLOPE CROSS-SECTIONS

PROPOSED DEVELOPMENT
WATERS EDGE AT DOBBS FERRY
DOBBS FERRY, NEW YORK

MRA	1" = 20'	CARLIN-SIMPSON AND ASSOCIATES 61 Main Street Sayreville, NJ 08872
RBS	15 NOV 06	
06-118	FIG -2	Consulting Geotechnical and Environmental Engineers