FACTUAL REPORT

AIRPORTS AUTHORITY OF JAMAICA

PROPOSED RESA EXTENSION FOR NMIA RUNWAY

PALISADOES, KINGSTON, JAMAICA

GEOTECH

SEPTEMBER 2008

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Authority

GEOTECH EXPLORATION SERVICES LIMITED (termed **Geotech** hereafter), was asked by **AIRPORTS AUTHORITY OF JAMAICA** (termed **AAJ** hereafter) to provide geotechnical investigation services to gather information concerning the nature of the sub-surface strata in Kingston Harbour in the vicinity of the existing active runway at Norman Manley International Airport. A subconsultant agreement was signed by Geotech and AAJ to facilitate these works.

This report is prepared in accordance with the subconsultant agreement and specification discussed between **AAJ** and **Geotech** and contains the results of the field and laboratory work done as part of this project.

1.2 Scope of Work

The scope of works to be undertaken by **Geotech** comprised:

a) The advancing of sixteen (16) offshore boreholes at the locations indicated on Fig. 3 “Chart showing borehole locations” which forms part of the tender document for geotechnical investigations.

b) Examination of samples recovered and laboratory tests carried out on selected samples.

c) Preparation of factual report containing results obtained in the field and laboratory.

1.3 Site

The work site geographically lies on the southern side of the Harbour, opposite central downtown Kingston. The lithology of the subsoils within the Harbour is influenced by the alluvial material present on the Liguanea Plains and as such the subsoils are expected to consist of sand silt gravel clay and organic material. The presence of surface water drainage into the Harbour also influences the underlying material present. Accumulations of broken and displaced coral material resulting from the intense battering of the reefs by storm waves during hurricanes may also be present.

2.0 FIELD DATA

2.1 Methodology

The borehole locations and depths were specified in the tender document for geotechnical investigations. The boreholes were located by Schroeter and Associates Limited who provided the latitude and longitude coordinates for each borehole in terms of the World Geographic System (WGS) 84, these coordinates are presented in Appendix I to this report. Although sixteen (16) boreholes were originally specified in the scope of works which forms part of the tender document, only thirteen (13) were advanced as per instructions from the client.

Boreholes were advanced by Geotech using a skid mounted Acker Rig with wash boring technique, NW casing and side discharge bit. The rig was mounted on a barge of dimensions 7.3m by 5.5m using a specially designed platform. Sampling was done in accordance with ASTM Standard Test Specification (D 1586-98), using a 63.5kg cat-head hammer falling from a height of 762mm on to a standard Split Spoon of outside diameter 50.8mm, driven for a total of 450mm thus providing N_{55} values for use in estimating strength. In general, the Split Spoon samples were taken every 1.5m.

Shelby tube samples were attempted in what was thought to be very soft – firm clayey material and these were pushed as opposed to hammered.

All soil samples were classified in accordance with the requirement specified in ASTM Visual-Manual Procedure D2488. The recovered split spoon soil samples were each placed in double plastic bags, sealed, labeled and transported to the laboratory of Jamaica Engineering and Technical Services Limited in Kingston.

Office borehole logs were prepared for each borehole based on the information taken from the field drilling logs, the laboratory visual examination and description, and the laboratory test results.

3.0 LABORATORY TEST RESULTS

Selected samples were submitted to the laboratory of Jamaica Engineering and Technical Services Limited (**JETS**) for classification and index testing only. The prescribed classification and index testing comprised of the following:

- Grain Size Distribution (ASTM D422)

Results of the tests performed are presented in Table 6-I through 6-II in Appendix II to this report; soil description and classification are in accordance with the Unified Soil Classification System (USCS).

3.1 Grain Size Distribution

Samples were tested using the wet sieve method where approximately 100g of the field sample is first dried and weighed, then soaked and washed through the No. 200 sieve.

The material retained is dried at approximately 110^{o} C and weighed before being hand sieved through all or some of the 75mm, 50mm, 37.5mm, 25mm, 19mm, 9.5mm, No.4, No.10, No. 20, No 40 and No. 200 sieves. The mass of sample retained on each sieve is then determined, the percentage passing each sieve calculated and the particle size distribution graph plotted

There were one hundred and one (101) samples submitted for the determination of their particle size distribution. The majority of the samples tested were coarse to fine sand occasionally combined with varying amounts of gravel and a trace of silt and clay. A small portion of the samples had gravel as the dominant material. The particle size distribution graphs and table of sieve results are presented in Table 6-II in Appendix II to this report.

4.0 CONCLUSION

Based on the findings obtained from the boreholes, a summary of the soil composition is as follows:

The thirteen (13) boreholes which were advanced were all driven to a maximum depth of 15.69m below mean sea level. The samples which were initially recovered from the boreholes were generally dark grey or black sand accompanied with shell fragments and or a trace of peat. The remaining samples were fairly consistent in their composition in that the dominant material present was sand with sizes ranging from coarse to fine. The sand was often accompanied by a trace of silt and a trace of clay in some instances. Gravel was present in some of the samples recovered however the greatest proportions were present in samples six and seven recovered from borehole 4G.

Shelby tube samples were collected from boreholes 1B, 1C and 2C, however due to the consistency of the in situ material in the other boreholes it was not possible to collect undisturbed samples from those boreholes.

GEOTECH EXPLORATION SERVICES LIMITED

Kayanna Bromfield
Junior Geologist

Gordon E. Hutchinson
Managing Director

5.0 APPENDICES

Appendix I - Office Borehole Logs

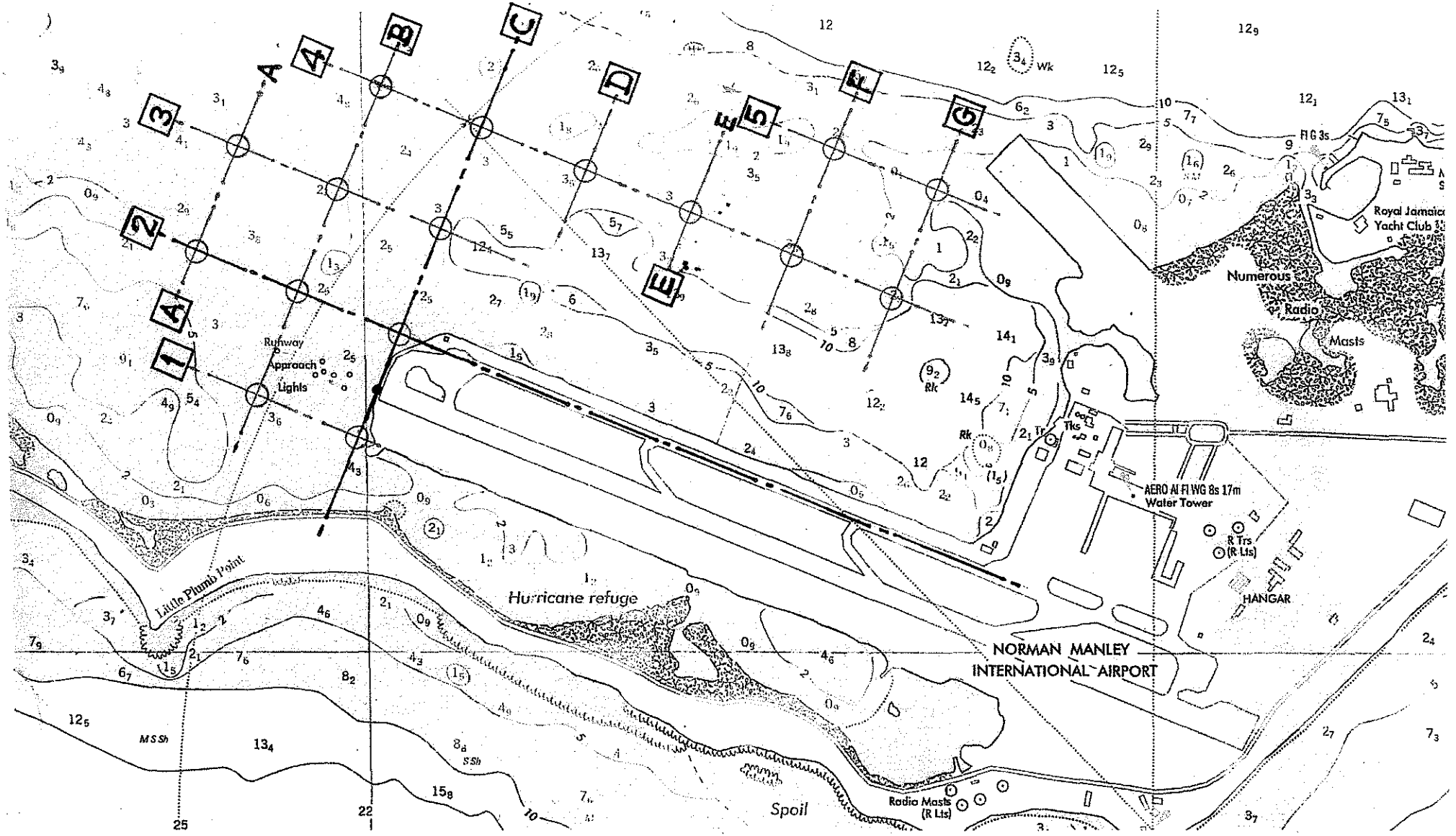
Appendix II - Laboratory Test Results

APPENDIX I
OFFICE BOREHOLE LOGS

- Borehole Coordinates
- Proposed Borehole Locations
- Symbols and Terms
- Borehole Logs

Latitude and Longitude Coordinates for each Borehole

Borehole No.	North	West
1B	17º 56’ 25.48”	76º 48’ 11.59”
1C	17º 56’ 21.74”	76º 48’ 01.98”
2B	17º 56’ 34.66”	76º 48’ 07.71”
2C	17º 56’ 30.94”	76º 47’ 58.09”
3A	17º 56’ 47.57”	76º 48’ 13.40”
3C	17º 56’ 40.14”	76º 47’ 54.21”
4B	17º 56’ 53.06”	76º 47’ 59.94”
4C	17º 56’ 49.31”	76º 47’ 50.33”
4D	17º 56’ 45.62”	76º 47’ 40.71”
4E	17º 56’ 41.90”	76º 47’ 31.10”
4G	17º 56’ 34.43”	76º 47’ 11.88”
5F	17º 56’ 47.35”	76º 47’ 17.60”
5G	17º 56’ 43.64”	76º 47’ 07.99”



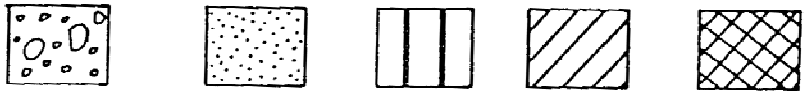
Appendix E Figure 3 PART OF HARBOUR CHART SHOWING BOREHOLE LOCATIONS

Boreholes shown thus: ⊕ The holes are to be set out on a 305m grid.
Gridline 2 is the centerline of the existing taxiway.
Gridline C must pass through the first approach light located just off the end of the existing runway.

SYMBOLS AND TERMS USED ON THE OFFICE BOREHOLE RECORD

Soil Types

(shown in symbol column)

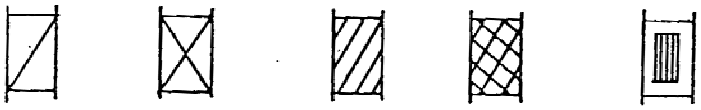


Gravel & Boulders | Sand | Silt | Clay | Fill

Limestone | Sandstone | Shale | Igneous

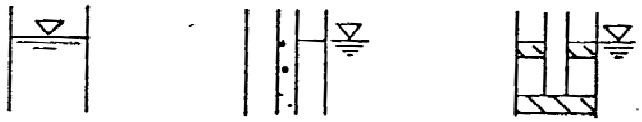
Sampler Types

(shown in samples column)



Wash Sample (WS) | Split Spoon (SS) | Shelby Tube (ST) | Piston Sample (PS) | Rock Core (RC)

Measurement of Water Level



Borehole | Standpipe | Piezometer

TERMS DESCRIBING RELATIVE DENSITY & SOIL CONSISTENCY

A. COARSE GRAINED SOILS (major portion retained on No. 200 sieve): includes (1) clean gravels, sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as determined by laboratory tests or by the Standard Penetration Test Resistance "N" – Value (the number of blows of a 140 lb. hammer falling 30 inches required to drive a 2 inch o.d. split spoon sampler one foot into the soil).

TERMS DESCRIBING RELATIVE DENSITY & SOIL CONSISTENCY

A. COARSE GRAINED SOILS (major portion retained on No. 200 sieve): includes (1) clean gravels, sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density, as determined by laboratory tests or by the Standard Penetration Test Resistance "N" - Value (the number of blows of a 140-lb. hammer falling 30 inches required to drive a 2-inch o.d. split spoon sampler one foot into the soil).

DESCRIPTIVE TERM	"N" VALUE (blows/foot)	RELATIVE DENSITY (%)	FRICTION ANGLE (degrees)
Very loose	<4	<15	<28
Loose	4 to 10	15 to 35	28 to 32
Compact or medium	10 to 30	35 to 65	32 to 36
Dense	30 to 50	65 to 85	36 to 40
Very dense	>50	>85	>40

Note: Occasionally correlation is attempted from the Dynamic Cone Penetration Test results which involves recording the number of blows of a 140 lb. hammer falling 30 inches required to drive a 2-inch diameter 60 degree cone one foot into the soil where the cone is attached to an "A" size drill rod and casing is not used.

B. FINE GRAINED SOILS (major portion passing No. 200 sieve): includes (1) inorganic and organic silts and clays, (2) gravelly sandy, silty clays and (3) clayey silts. Consistency is rated according to undrained shear strength as indicated by In-situ Field or Laboratory Vane Tests, Unconfined Compression Tests or occasionally by Standard Penetration Tests.

DESCRIPTIVE TERM	UNDRAINED SHEAR STRENGTH (pounds per sq.ft.)	"N" VALUE (blows per ft.)
Very soft	<250	<2
Soft	250 to 500	2 to 4
Firm	500 to 1000	4 to 8
Stiff	1000 to 2000	8 to 15
Very stiff	2000 to 4000	15 to 30
Hard	>4000	>30

Note: Slickensided and fissured clays may have lower shear strengths than shown above, because of planes of weakness or cracks in the soil.

Terminology used for describing various soil strata encountered in a borehole is based upon the proportion of individual particle sizes present in the deposit as follows:

DESCRIPTIVE TERM	PROPORTION (%)
Trace	<10
Some	10 to 20
Adj. (e.g. Silty or Sandy)	20 to 35
and (e.g. Silt and Sand	35 to 50

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643416.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770847.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water From Surface to 4.57m								
1									
2									
3									
4									
5	Shelby from 4.57 - 5.18m Very Loose Dark Grey SAND with some				P U S	1			

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 1 of 4
Completion	9/8/08		FIG No.
Final W.L.		1B	5.2

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643416.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770847.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	ID Mark	Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5	Gravel & a trace of Peat			H					
	Very Loose Dark Grey Coarse to Fine SAND with some Silt & a trace of Peat			1 2 2		2	46 46		
6									
7	Compact Dark Grey Coarse to Medium SAND with traces of Gravel & Silt			11 12 13		3	46 13		
8									
9	Dense Dark Grey Coarse to Fine SAND with some Silt			13 16 17		4	46 38		
10									

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	Dates	Job No. 200824
Start	9/8/08	Sheet 2 of 4
Completion	9/8/08	B.H. No. 1B
Final W.L.		FIG No. 5.2

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643416.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770847.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Dense Dark Grey Coarse to Medium SAND with some Gravel and a trace of Silt			11 16 20		5	46 38		
11									
	Very Dense Dark Grey Gravelly Coarse to Fine SAND with a trace of Silt			28 50/13cm		6	28 23		>>
12									
13									
	Dense Dark Grey Coarse to Fine SAND with traces of Gravel & Silt			13 25 30		7	46 36		
14									
	Dense Dark Grey Coarse to Fine SAND with traces of Gravel & Silt								
15									

Soil Descriptions are subjective

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	9/8/08	B.H. No. 1B	Sheet 3 of 4
Completion	9/8/08		FIG No. 5.2
Final W.L.			

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643416.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770847.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15				22 27 29		8	46 38		
	End Of Bore Hole @ 15.69m								
16									
17									
18									
19									
20									

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	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 4 of 4
Completion	9/8/08		FIG No.
Final W.L.		1B	5.2

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643301.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771130.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
0	Surface: Water From Surface to 4.57m below								
5	Black Silty Medium to Fine SAND with some Clay				P U S	1			

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	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 1 of 4
Completion	9/8/08		FIG No.
Final W.L.		1C	5.3

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643301.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771130.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	ID Mark	Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5				H					
6	Very Loose Dark Grey Coarse to Fine SAND with some Silt and traces of Shell Fragments and Peat			2 1 1		2	46 46		
7	Loose Dark Grey Coarse to Fine SAND with traces of Silt and Gravel			10 12 16		3	46 38		
8									
9	Compact Dark Grey Coarse to Fine SAND with a trace of Silt			12 17 18		4	46 36		
10									

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 2 of 4
Completion	9/8/08		FIG No.
Final W.L.		1C	5.3

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643301.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771130.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Compact Dark Grey Coarse to Fine SAND with a trace of Silt			11 15 19		5	46 41		
11									
	Dense Dark Grey Coarse to Medium SAND								
12				13 28 38		6	46 41		
13									
	Dense Dark Grey Coarse to Fine SAND with a trace of Silt								
14				12 23 31		7	46 41		
	Compact Dark Grey Coarse to Fine SAND with a trace of Silt								
15									

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 3 of 4
Completion	9/8/08		FIG No.
Final W.L.		1C	5.3

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643301.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771130.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15				17 22 27		8	46 38		
	End Of Bore Hole @ 15.69m								
16									
17									
18									
19									
20									

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	9/8/08	B.H. No.	Sheet 4 of 4
Completion	9/8/08		FIG No.
Final W.L.		1C	5.3

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643698.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770961.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water From Surface to 4.57m below								
1									
2									
3									
4									
5	Very Loose Grey Coarse to Fine SAND with some Shells and Silt								

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OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	5/8/08	B.H. No.	Sheet 1 of 4
Completion	5/8/08		FIG No.
Final W.L.		2B	5.4

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643698.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770961.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
6	Loose Dark Grey Coarse to Fine SAND with some Shell Fragments, Silt & Gravel			1 2 2		1	46 30		
				8 6 7		2	46 30		
7	Compact Dark Grey Gravelly Medium to Fine SAND with a trace of Silt								
8				9 20 17		3	46 43		
9	Very Dense Dark Grey Coarse to Medium SAND with some Shell Fragments & Gravel			39 50/5cm		4	25 20		
10									

>>

Soil Descriptions are subjective

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14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	5/8/08	B.H. No.	Sheet 2 of 4
Completion	5/8/08		FIG No.
Final W.L.		2B	5.4

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643698.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770961.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
11	Compact Dark Grey Coarse to Fine SAND with some Gravel & Silt and a trace of Shell Fragments			46 13 19		5	46 30		
12	Dense Dark Grey Coarse to Fine SAND with some Silt and a trace of Gravel			37 29 30		6	46 35		
13									
14	Dense Dark Grey Coarse to Medium SAND with traces of Shell Fragments & Silt			10 18 21		7	46 30		
15	Dense Dark Grey Medium to Fine SAND with some Silt								

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	5/8/08	B.H. No.	Sheet 3 of 4
Completion	5/8/08		FIG No.
Final W.L.		2B	5.4

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643698.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770961.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15				14 19 24		8	46 30		
	End Of Bore Hole @ 15.69m								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	5/8/08	B.H. No.	Sheet 4 of 4
Completion	5/8/08		FIG No.
Final W.L.		2B	5.4

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643584.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771244.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
0	Surface: Water From Surface to 4.88m below								
1									
2									
3									
4									
5	Black Medium to Fine SAND with some								

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	7/8/08	B.H. No.	Sheet 1 of 4
Completion	7/8/08		FIG No.
Final W.L.		2C	5.5

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643584.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771244.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
	Silt and a trace of Peat Push for 0.61m			PUSH		1			
6	Loose Grey Gravelly Coarse to Medium SAND with a trace of Silt			5 4 4		2	46 38		
7	Compact Grey Coarse to Medium SAND			8 10 13		3	46 41		
8									
9	Compact Grey Coarse to Medium SAND			14 16 14		4	46 30		
10									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	7/8/08	B.H. No. 2C	Sheet 2 of 4
Completion	7/8/08		FIG No. 5.5
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643584.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771244.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Compact Grey Coarse to Fine SAND with a trace of Silt			14 17 17		5	46 38		
11									
	Compact Grey Coarse to Fine SAND with a trace of Silt								
12				10 13 19		6	46 38		
13									
	Compact Grey Coarse to Fine SAND with some Gravel & a trace of Silt			15 17 20		7	46 36		
14									
	Compact Grey Coarse to Fine SAND with some Gravel & a trace of Silt								
15									

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	7/8/08	Sheet 3 of 4
Completion	7/8/08	B.H. No. 2C
Final W.L.		FIG No. 5.5

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643584.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771244.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15									
				17 18 21		8	46 38		
	End Of Bore Hole @ 15.69m								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	7/8/08	B.H. No.	Sheet 4 of 4
Completion	7/8/08		FIG No.
Final W.L.		2C	5.5

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644095.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770793.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water From 0 to 4.57m		▽						
1									
2									
3									
4									
5	Very Loose Light Brown Coarse to Fine SAND with Shell Fragments		▼	1 1 0	X	1	46 2.5cm		●

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	26/7/08	B.H. No.	Sheet 1 of 4
Completion	26/7/08		FIG No.
Final W.L.	4.6	3A	5.6

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644095.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770793.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	ID Mark	Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
6	Very Loose Grey Medium to Fine SAND with some Silt and a trace of Peat			1 1 1		2	46 46		
7	Compact Coarse to Fine SAND with traces of Gravel & Silt			10 13 16		3	46 38		
8									
9	Dense Grey Coarse to Fine SAND & GRAVEL			12 20 20		4	46 38		
10									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	26/7/08	Sheet 2 of 4
Completion	26/7/08	B.H. No. 3A
Final W.L.	4.6	FIG No. 5.6

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644095.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770793.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Very Dense Grey Coarse to Medium SAND								
11				50/2.5cm		5	13 10		>>
	Very Dense Grey Coarse to Medium SAND								
12				39 50/5cm		6	25 23		>>
13									
	Dense Grey Coarse to Fine SAND with some Silt and a trace of Gravel								
14				23 20 23		7	46 38		
	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt								
15									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	26/7/08	B.H. No.	Sheet 3 of 4
Completion	26/7/08		FIG No.
Final W.L.	4.6	3A	5.6

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644095.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	770793.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15									
				37			28		
				50/2.5cm		8	25		>>
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	26/7/08	B.H. No.	Sheet 4 of 4
Completion	26/7/08		FIG No.
Final W.L.	4.6	3A	5.6

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643867.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771358.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0									
	Surface: Water From 0 to 4.57m								
1									
2									
3									
4									
5	Compact Dark Grey Coarse to Fine SAND with some Peat and Shell Fragments			3 8 6		1	46 23		

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	22/7/08	Sheet 1 of 4
Completion	22/7/08	B.H. No. 3C
Final W.L.		FIG No. 5.7

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643867.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771358.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
5									
6	Compact Dark Grey Coarse to Medium SAND with some Gravel and a trace of Silt			4 6 6		2	46 28		
7	Compact Grey Gravelly Coarse to Medium SAND with a trace of Silt			19 8 11		3	46 20		
8									
9	Very Dense Grey Silty Medium to Fine SAND			18 30 50		4	46 30		
10									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	22/7/08	B.H. No.	Sheet 2 of 4
Completion	22/7/08		FIG No.
Final W.L.		3C	5.7

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643867.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771358.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Very Dense Grey Medium to Fine SAND with some Silt			39 42 50		5	46 38		
11									
	Very Dense Grey Medium to fine SAND with some Silt			31 39 48		6	46 28		
12									
13									
	Very Dense Grey Silty Coarse to Medium SAND			39 50/5cm		7	25 18		
14									>>
	Very Dense Grey Coarse to Medium SAND								
15									

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	22/7/08
Completion	22/7/08
Final W.L.	

Job No. 200824

Sheet 3 of 4

B.H. No. 3C

FIG No. 5.7

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643867.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771358.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15				36 42 50/8cm		8	38 30		>>
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	22/7/08	Sheet 4 of 4
Completion	22/7/08	B.H. No. 3C
Final W.L.		FIG No. 5.7

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644264.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771190.0	Elevation	-5.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water From 0 to 5.49m								
1									
2									
3									
4									
5									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	24/7/08	B.H. No. 4B	Sheet 1 of 4
Completion	24/7/08		FIG No. 5.8
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644264.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771190.0	Elevation	-5.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
	No Recovery After Driving Hammer 0.46m								
6				1 0 1		1	46 0		
7	Compact Grey Coarse to Medium SAND with a trace of Shell Fragments & Gravel								
8				6 9 10		2	46 43		
	Very Dense Grey Medium to Fine SAND with a trace of Silt								
9				7 4 50		3	46 41		
10									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	24/7/08	B.H. No. 4B	Sheet 2 of 4
Completion	24/7/08		FIG No. 5.8
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644264.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771190.0	Elevation	-5.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Very Dense Grey Medium to Fine SAND with a trace of Silt			11 37 40		4	46 41		
11									
	Very Dense Grey Medium to Fine SAND								
12				40 50/8cm		5	23 20		>>
13									
	Very Dense Grey Coarse to Fine SAND with some Gravel and a trace of Silt								
14				29 37 39		6	46 46		
	Very Dense Grey Medium to Fine SAND with a trace of Silt								
15									

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	24/7/08	B.H. No.	Sheet 3 of 4
Completion	24/7/08		FIG No.
Final W.L.		4B	5.8

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644264.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	771190.0	Elevation	-5.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15				30 33 41		7	46 46		
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	24/7/08	B.H. No.	Sheet 4 of 4
Completion	24/7/08		FIG No.
Final W.L.		4B	5.8

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference	Type/Size
Northing Datum	Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting Elevation -4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0									
	Surface : Water from Surface to 4.57m								
1									
2									
3									
4									
5	Very Loose Grey Medium SAND with some Shell Fragments			100		1	465		

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	28/7/08	Sheet 1 of 4
Completion	28/7/08	B.H. No. 4C
Final W.L.		FIG No. 5.9

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference	Type/Size
Northing Datum	Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting Elevation -4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
6	Compact Dark Grey Medium SAND with a trace of Shell Fragments			8 10 9		2	46 38		
7	Compact Dark Grey Gravelly Medium to Fine SAND with a trace of Silt			8 13 10		3	46 43		
8									
9	Dense Grey Coarse to Fine SAND with some Gravel and a trace of Silt			10 22 29		4	46 43		
10									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	28/7/08
Completion	28/7/08
Final W.L.	

Job No. 200824

Sheet 2 of 4

B.H. No. 4C

FIG No. 5.9

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference	Type/Size
Northing Datum	Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting Elevation -4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
10									
11	Dense Grey Coarse to Fine SAND with some Gravel and a trace of Silt			9 38 37		5	46 30		
12	Dense Grey Coarse to Fine SAND & GRAVEL with a trace of Silt			11 39 37		6	46 38		
13									
14	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			37 48 50/5cm		7	41 36		>>
15	Very Dense Grey Coarse to Fine SAND & GRAVEL and a trace of Silt								

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	28/7/08
Completion	28/7/08
Final W.L.	

Job No. 200824

B.H. No. 4C

FIG No. 5.9

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference	Type/Size
Northing Datum	Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting Elevation -4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear 50 100 150 200
15				39 45 50/8cm		8	38 30		>>
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	28/7/08	Sheet 4 of 4
Completion	28/7/08	B.H. No. 4C
Final W.L.		FIG No. 5.9

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644036.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771755.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water from 0 - 4.57m								
1									
2									
3									
4									
5	Very Loose Grey Medium to Fine SAND with trace of shell fragments & siLT			1 0 1		1	46 43		

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	23/7/08	B.H. No.	Sheet 1 of 4
Completion	23/7/08		FIG No.
Final W.L.		4D	5.10

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644036.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771755.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
	Compact Grey Medium to Fine SAND with some Gravel			6 9 10		2	46 36		
6									
7									
	Compact Grey Medium to Fine SAND with some Silt			22 9 12		3	46 41		
8									
	Dense Grey Coarse to Fine SAND & GRAVEL			30 26 21		4	46 41		
9									
10									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	23/7/08	B.H. No. 4D	Sheet 2 of 4
Completion	23/7/08		FIG No. 5.10
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644036.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771755.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Very Dense brown Silty Medium to Fine SAND with some Gravel			40 45 50/13cm		5	46 25		
11									
	Very Dense Brown Medium to Fine SAND with some Silt and a trace of Gravel			39 40 43		6	46 30		
12									
13									
	Very Dense Grey Gravelly Coarse to Fine SAND with some Silt			37 39 40		7	46 33		
14									
	Very Dense Grey Gravelly Coarse to Fine SAND some Silt								
15									

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	23/7/08	B.H. No.	Sheet 3 of 4
Completion	23/7/08		FIG No.
Final W.L.		4D	5.10

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644036.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	771755.0	Elevation	-4.4	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15				45 41 50/10cm		8	46 28		>>
	End of Borehole at 15.69m								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	23/7/08	B.H. No.	Sheet 4 of 4
Completion	23/7/08		FIG No.
Final W.L.		4D	5.10

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643922.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772038.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
0	Surface : Water from Surface to 4.57m								
1									
2									
3									
4									
5	Very Loose Dark Grey Coarse SAND with some Shell Fragments and a trace of Silt		▼	0 0 1	X	1	46 43		

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	27/7/08	B.H. No.	Sheet 1 of 4
Completion	27/7/08		FIG No.
Final W.L.	4.6	4E	5.11

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643922.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772038.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) ● (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5	First 0.3m went down under weight of hammer								
	Loose Dark Grey Coarse to Fine SAND with traces of Gravel & Silt			5 4 6		2	46 41		
6									
7	Compact Grey Coarse to Fine SAND with some Gravel & a trace of Silt			10 16 36		3	46 46		
8									
9	Very Dense Grey Coarse SAND & GRAVEL			17 33 35		4	46 46		
10									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	27/7/08
Completion	27/7/08
Final W.L.	4.6

Job No. 200824

B.H. No. 4E

Sheet 2 of 4

FIG No. 5.11

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643922.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772038.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Dense Grey Silty Coarse to Fine SAND with a trace of Gravel								
11				21 46 14		5	46 43		
	Very Dense Silty Grey Coarse to Fine SAND with some Gravel								
12									
				10 25 32		6	46 43		
13									
	Very Dense Grey Silty Coarse to Fine SAND with some Gravel								
14									
				29 33 39		7	46 43		
	Very Dense Grey Silty Gravelly Coarse to Fine Coarse SAND								
15									

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	27/7/08
Completion	27/7/08
Final W.L.	4.6

Job No. 200824

Sheet 3 of 4

B.H. No. 4E

FIG No. 5.11

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643922.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772038.0	Elevation	-4.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15				40 45 50		8	46 41		
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	27/7/08
Completion	27/7/08
Final W.L.	4.6

Job No. 200824

Sheet 4 of 4

B.H. No. 4E

FIG No. 5.11

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643693.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	772604.0	Elevation	-3.9	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
0	Surface: Water From 0 to 3.66m								
4	Spoon went down under weight of Hammer NO Recovery			0 0 0		1	46 0		
5	Compact Dark Grey Medium to Fine SAND with some Peat and Shell Fragments			1 3 9		2	46 23		

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	21/7/08	Sheet 1 of 4
Completion	21/7/08	B.H. No. 4G
Final W.L.		FIG No. 5.12

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643693.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	772604.0	Elevation	-3.9	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
5									
6	Compact Dark Grey Coarse to Fine Medium SAND with some Gravel & Shells Fragments			2 6 9		3	46 23		
7	Dense Dark Grey Coarse to Fine SAND & GRAVEL with a trace of Silt								
8				17 21 26		4	46 30		
9	Dense Dark Grey Coarse to Fine SAND & GRAVEL with a trace of Silt								
10				20 14 26		5	46 30		

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	21/7/08
Completion	21/7/08
Final W.L.	

Job No. 200824

B.H. No. 4G

Sheet 2 of 4

FIG No. 5.12

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643693.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	772604.0	Elevation	-3.9	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
	Very Dense Dark Greenish Grey Coarse Sandy GRAVEL with a trace of Silt								
11				42 50/5cm		6	25 20		>>
	Very Dense Dark Grey Sandy GRAVEL with a trace of Silt								
12									
				37 45 50/10cm		7	38 23		>>
13									
	Very Dense Dark Grey Coarse to Fine SAND & GRAVEL with a trace of Silt								
14				32 43 47		8	46 38		
	Very Dense Dark Grey & Brown GRAVEL & SAND with a trace of Silt								
15									

Soil Descriptions are subjective

GEOTECH **EXPLORATION SERVICES LIMITED**
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	21/7/08	B.H. No.	Sheet 3 of 4
Completion	21/7/08		FIG No.
Final W.L.		4G	5.12

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643693.0	Datum		Wash Boring with NQ rod/ SPT with 63.5Kg Cathead Hammer
Easting	772604.0	Elevation	-3.9	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity (P.L. M.C. L.L.) 20 40 60 80 / Wet Unit Weight (kNm^3) 14.0 18.0 22.0 26.0	Standard Penetration Test (Blows/0.3m) 20 40 60 80 / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ 50 100 150 200
15									
				37			46		
				45			30		
				42		9			
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates
Start	21/7/08
Completion	21/7/08
Final W.L.	

Job No. 200824

Sheet 4 of 4

B.H. No. 4G

FIG No. 5.12

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644090.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772435.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface : Water from Surface to 3.66m								
4	Very Loose Speckled Grey Medium to Fine SAND with traces of Peat and Shells			1 0 1		1	46 20		
5	Compact Speckled Grey Medium to Fine SAND with some Shells & Silt			10 6 7		2	46 46		

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	29/7/08	Sheet 1 of 4
Completion	30/7/08	B.H. No. 5F
Final W.L.		FIG No. 5.13

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension

ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644090.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772435.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
6	Loose Grey Coarse to Medium SAND with some Gravel			4 5 7		3	46 46		
7	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			16 24 28		4	46 36		
8									
9	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			24 27 29		5	46 38		
10									

EXPLORATION SERVICES LIMITED

14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	29/7/08	B.H. No. 5F	Sheet 2 of 4
Completion	30/7/08		FIG No. 5.13
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension

ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644090.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772435.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
11	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			20 23 29		6	46 38		
12	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			24 21 23		7	46 41		
13									
14	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			25 29 32		8	46 38		
15	Very Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt								

EXPLORATION SERVICES LIMITED

14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824
Start	29/7/08	Sheet 3 of 4
Completion	30/7/08	B.H. No. 5F
Final W.L.		FIG No. 5.13

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	644090.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772435.0	Elevation	-4.2	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test ● (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15				18 17 20		9	46 41		
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	29/7/08	B.H. No. 5F	Sheet 4 of 4
Completion	30/7/08		FIG No. 5.13
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643976.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772718.0	Elevation	-3.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
0	Surface: Water From 0 to 4.57m								
4	Very Loose Light Brown Coarse SAND & Shell Fragments			1 0 1		1	46 2.5		
5	Compact Grey Silty Medium to Fine SAND with some Shell Fragments and a trace of Peat			3 9 12		2	46 38		

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	27/7/08	B.H. No. 5G	Sheet 1 of 4
Completion	27/7/08		FIG No. 5.14
Final W.L.			

Soil Descriptions are subjective

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643976.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772718.0	Elevation	-3.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples: Type	Samples: ID Mark	Samples: Recovery	Plasticity: P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
5									
	Compact Grey Medium to fine SAND with a trace of Shell Fragments & Silt			7 9 11		3	46 41		
6									
7	Dense Grey Gravelly Coarse to Fine SAND with a trace of Silt			22 17 20		4	46 41		
8									
9	Very Dense Grey SAND & GRAVEL with a trace of Silt			32 46 50		5	46 41		
10									

Soil Descriptions are subjective

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	27/7/08	B.H. No.	Sheet 2 of 4
Completion	27/7/08		FIG No.
Final W.L.		5G	5.14

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643976.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772718.0	Elevation	-3.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight □ (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
10									
11	Very Dense Grey SAND & GRAVEL with a trace of Silt			17 48 50		6	46 33		
12	Very Dense Grey SAND & GRAVEL with a trace of Silt			49 45 33		7	46 41		
13									
14	Very Dense Grey SAND & GRAVEL with a trace of Silt			43 39 40		8	46 33		
15	Very Dense Grey SAND & GRAVEL with a trace of Silt								

Soil Descriptions are subjective

GEOTECH EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	27/7/08	B.H. No. 5G	Sheet 3 of 4
Completion	27/7/08		FIG No. 5.14
Final W.L.			

CLIENT: Airports Authority of Jamaica
PROJECT: NMIA Runway Extension
ADDRESS: Palisadoes

Location Reference				Type/Size
Northing	643976.0	Datum		Wash Boring with NQ rod, Chop 0.3 m Before each Sample was taken / SPT with 63.5Kg Cathead Hammer,
Easting	772718.0	Elevation	-3.7	

Sample Types: Wash | Grab | Split S. | T.W. Tube | R. Core

Depth (m)	Soil Description	Strata Plot	Water Level	SPT Blow Cnt	Samples Type	Samples ID Mark	Samples Recovery	Plasticity P.L. M.C. L.L. (20 40 60 80) / Wet Unit Weight (kNm^3) (14.0 18.0 22.0 26.0)	Standard Penetration Test (Blows/0.3m) (20 40 60 80) / Undrained Unconfined Shear (kPa) Comp. Test + Vane Shear ■ (50 100 150 200)
15				29 40 43		9	46 33		
	End Of Bore Hole @ 15.69								
16									
17									
18									
19									
20									

EXPLORATION SERVICES LIMITED
14a Hope Road
Kingston 10, Jamaica W.I.

OFFICE BOREHOLE RECORD

	Dates	Job No. 200824	
Start	27/7/08	B.H. No. 5G	Sheet 4 of 4
Completion	27/7/08		FIG No. 5.14
Final W.L.			

Soil Descriptions are subjective

APPENDIX II

LABORATORY TEST RESULTS

Table 6 – I - Summary of Laboratory Test Result

Table 6 – II - Soil Grain Size Distributions

Project: **NMIA Runway Extension** Job Number: **200824** Sheet **1** of **5**

Manager: Client: **Airports Authority of Jamaica** Project Notes: ,

Location: **Palisadoes**

,

Elevation Datum:

Borehole / Depth / Elev.	Specimen Description				Bulk Density	Dry Density	Water Content	Layer Code	Sample Data				
	LL	PL	PI	Fines					Top	Bottom	Type	Rec	'N'
1B 4.6 -9.3				34.9					4.6	5.2	TW		P,U,S,H
1B 6.1 -10.8				15.1					6.1	6.6	SS	46,46	1,2,2
1B 7.6 -12.3	POORLY GRADED SAND			3.2									
1B 9.1 -13.8				12.4									
1B 10.7 -15.4	POORLY GRADED SAND			3.1					10.7	11.1	SS	46,38	11,16,20
1B 12.2 -16.9				8.4					12.2	12.7	SS	28,22	28,50/13cm
1B 13.7 -18.4	WELL-GRADED SAND			3.7									
1B 15.2 -19.9				5.2									
1C 4.6 -9.3				39.2					4.6	5.2	TW		P,U,S,H
1C 6.1 -10.8				17.5					6.1	6.6	SS	46,46	2,1,1
1C 7.6 -12.3				7.8									
1C 9.1 -13.8				6.1									
1C 10.7 -15.4				5.9					10.7	11.1	SS	46,41	11,15,19
1C 12.2 -16.9	POORLY GRADED SAND			3.6					12.2	12.7	SS	46,41	13,28,38
1C 13.7 -18.4				7.3									
1C 15.2 -19.9				10.2									
2B 5.2 -9.9				14.4					5.2	5.6	SS	46,30	1,2,2
2B 6.1 -10.8				13.9					6.1	6.6	SS	46,30	8,6,7
2B 7.6 -12.3				5.9									

JETS

Summary of Soil Properties

TABLE 6-I (a)

Project: **NMIA Runway Extension** Job Number: **200824** Sheet **2** of **5**

Borehole Depth / Elev.	Specimen Description	LL	PL	PI	Fines	Bulk Density	Dry Density	Water Content	Layer Code	Sample Data Top	Bottom	Type	Rec	'N'
2B 9.1 -13.8	POORLY GRADED SAND with GRAVEL				1.6									
2B 10.7 -15.4					14.5					10.7	11.1	SS	46,30	46,13,19
2B 12.2 -16.9					17.3					12.2	12.7	SS	46,35	37,29,30
2B 13.7 -18.4					5.4									
2B 15.2 -19.9					14.8									
2C 4.9 -9.6					34.3					4.9	5.5	TW		P,U,S,H
2C 6.1 -10.8					7.2					6.1	6.6	SS	46,38	5,4,4
2C 7.6 -12.3	POORLY GRADED SAND with GRAVEL				2.6									
2C 9.1 -13.8	POORLY GRADED SAND				4.5									
2C 10.7 -15.4					9.9					10.7	11.1	SS	46,38	14,17,17
2C 12.2 -16.9					9.0					12.2	12.7	SS	46,38	10,13,19
2C 13.7 -18.4					9.5									
2C 15.2 -19.9					5.4									
3A 6.1 -10.5					22.7					6.1	6.6	SS	46,46	1,1,1
3A 7.6 -12.0	WELL-GRADED SAND				3.9									
3A 9.1 -13.5	POORLY GRADED SAND with GRAVEL				4.5									
3A 10.7 -15.1	POORLY GRADED SAND				1.7					10.7	11.1	SS	13,10	50/2.5cm
3A 12.2 -16.6	POORLY GRADED SAND				1.5					12.2	12.7	SS	25,23	39,50/5cm
3A 13.7 -18.1					11.4									
3A 15.2 -19.6					5.4									
3C 4.6 -8.8					10.4					4.6	5.0	SS	46,23	3,8,6
3C 6.1 -10.3					5.9					6.1	6.6	SS	46,28	4,6,6

JETS

Summary of Soil Properties

TABLE 6-I (b)

Project: **NMIA Runway Extension** Job Number: **200824** Sheet **3** of **5**

Borehole Depth / Elev.	Specimen Description	LL	PL	PI	Fines	Bulk Density	Dry Density	Water Content	Layer Code	Sample Data Top	Bottom	Type	Rec	'N'
3C 7.6 -11.8	POORLY GRADED SAND with GRAVEL				3.6									
3C 9.1 -13.3					27.9									
3C 10.7 -14.9					16.8					10.7	11.1	SS	46,38	39,42,50
3C 12.2 -16.4					12.1					12.2	12.7	SS	46,28	31,39,48
3C 13.7 -17.9					34.2									
3C 15.2 -19.4	POORLY GRADED SAND				4.1									
4B 7.6 -12.8	POORLY GRADED SAND with GRAVEL				1.2									
4B 9.1 -14.3	POORLY GRADED SAND				4.1									
4B 10.7 -15.9					5.8					10.7	11.1	SS	46,41	11,37,40
4B 12.2 -17.4					8.6					12.2	12.7	SS	23,20	40,50/8cm
4B 13.7 -18.9					8.1									
4B 15.2 -20.4					8.7									
4C 6.1 -10.8	POORLY GRADED SAND				0.3					6.1	6.6	SS	46,38	8,10,9
4C 7.6 -12.3					7.0									
4C 9.1 -13.8					7.4									
4C 10.7 -15.4					8.8					10.7	11.1	SS	46,30	9,38,37
4C 12.2 -16.9					7.5					12.2	12.7	SS	46,38	11,39,37
4C 13.7 -18.4					8.5									
4C 15.2 -19.9					6.0									
4D 4.6 -9.0	POORLY GRADED SAND with GRAVEL				1.0					4.6	5.0	SS	46,43	1,0,1
4D 6.1 -10.5					5.4					6.1	6.6	SS	46,36	6,9,10
4D 7.6 -12.0					11.8									

JETS

Summary of Soil Properties

TABLE 6-I (c)

3209:Soilpaz:18-9-08

Project: **NMIA Runway Extension** Job Number: **200824** Sheet **4** of **5**

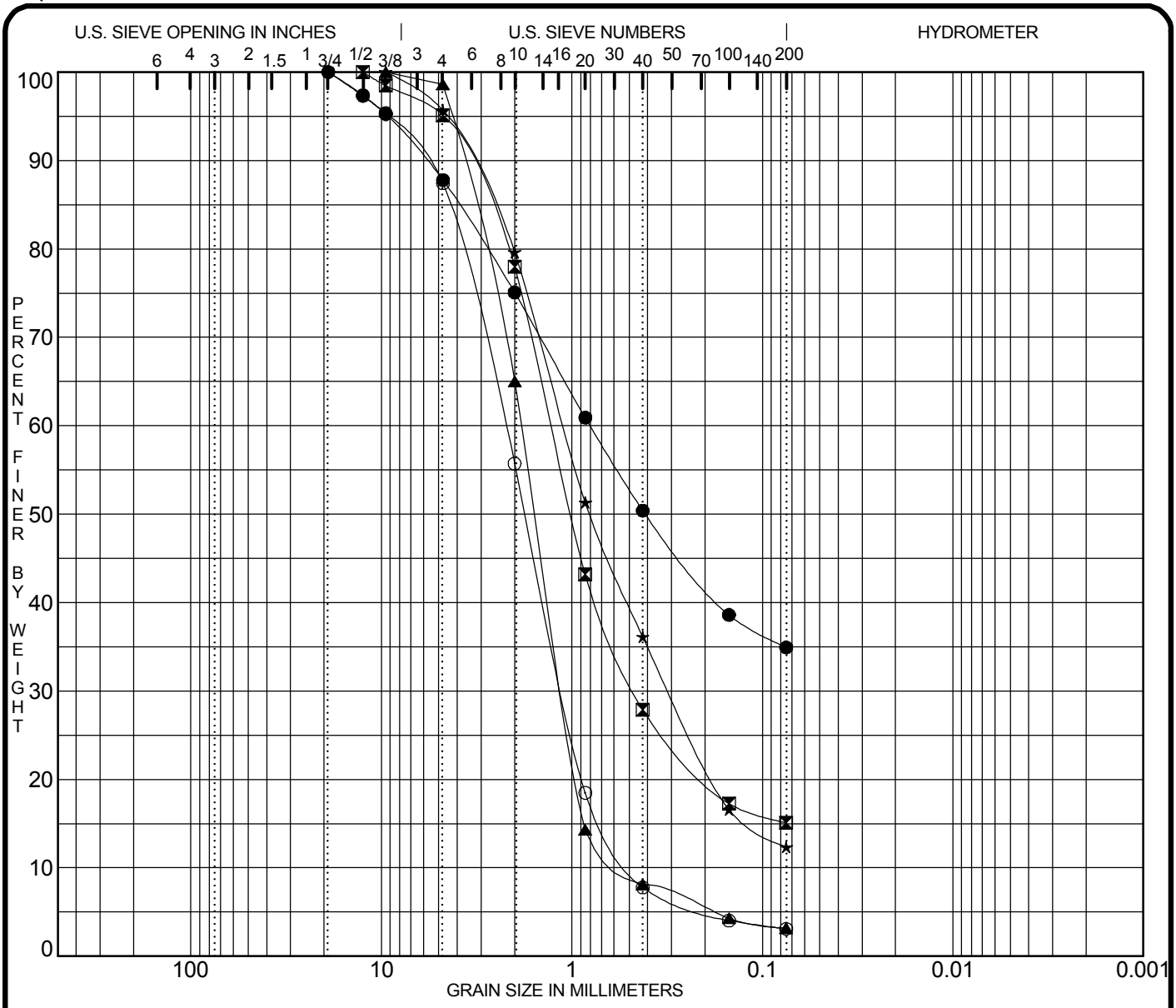
Borehole Depth / Elev.	Specimen Description	LL	PL	PI	Fines	Bulk Density	Dry Density	Water Content	Layer Code	Sample Data Top	Bottom	Type	Rec	'N'
4D 9.1 -13.5	WELL-GRADED SAND with GRAVEL				2.5									
4D 10.7 -15.1					24.3					10.7	11.1	SS	46,45	50/13cm
4D 12.2 -16.6					16.3					12.2	12.7	SS	46,30	39,40,43
4D 13.7 -18.1					13.0									
4D 15.2 -19.6					10.6									
4E 4.6 -9.3					9.2					4.6	5.0	SS	46,43	0,0,1
4E 6.1 -10.8	WELL-GRADED SAND				4.8					6.1	6.6	SS	46,41	5,4,6
4E 7.6 -12.3	WELL-GRADED SAND				4.7									
4E 9.1 -13.8					5.0									
4E 10.7 -15.4					27.2					10.7	11.1	SS	46,43	21,46,14
4E 12.2 -16.9					28.0					12.2	12.7	SS	46,43	10,25,32
4E 13.7 -18.4					21.6									
4E 15.2 -19.9					22.3									
4G 4.6 -8.5					11.2					4.6	5.0	SS	46,23	1,3,9
4G 6.1 -10.0	WELL-GRADED SAND with GRAVEL				3.3					6.1	6.6	SS	46,23	2,6,9
4G 7.6 -11.5					5.7									
4G 9.1 -13.0	WELL-GRADED GRAVEL with SAND				4.3									
4G 10.7 -14.6					5.5					10.7	11.1	SS	25,20	2,50/5cm
4G 12.2 -16.1					6.4					12.2	12.7	SS	37,28	35,50/10cm
4G 13.7 -17.6					6.1									
4G 15.2 -19.1					5.2									
5F 3.7 -7.9					9.8					3.7	4.1	SS	46,20	1,0,1

JETS | **Summary of Soil Properties** | **TABLE 6-I (d)**

3209:Soilpaz:18-9-08

Project: **NMIA Runway Extension** Job Number: **200824** Sheet **5** of **5**

Borehole Depth / Elev.	Specimen Description	LL	PL	PI	Fines	Bulk Density	Dry Density	Water Content	Layer Code	Sample Data Top	Bottom	Type	Rec	'N'
5F 4.6 / -8.8					10.3					4.6	5.0	SS	46,46	10,6,7
5F 6.1 / -10.3	POORLY GRADED SAND with GRAVEL				1.3					6.1	6.6	SS	46,46	4,5,7
5F 7.6 / -11.8					7.7									
5F 9.1 / -13.3					6.9									
5F 10.7 / -14.9					8.2					10.7	11.1	SS	46,38	20,23,29
5F 12.2 / -16.4					7.1					12.2	12.7	SS	46,41	24,21,23
5F 13.7 / -17.9					7.1									
5F 15.2 / -19.4					10.3									
5G 4.6 / -8.3					24.2					4.6	5.0	SS	46,38	3,9,12
5G 6.1 / -9.8					5.3					6.1	6.6	SS	46,41	7,9,11
5G 7.6 / -11.3					6.0									
5G 9.1 / -12.8					5.0									
5G 10.7 / -14.4					5.8					10.7	11.1	SS	46,33	17,48,50
5G 12.2 / -15.9					6.3					12.2	12.7	SS	46,41	49,45,33
5G 13.7 / -17.4					6.2									
5G 15.2 / -18.9					6.0									



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	1B	4.6							
⊠	1B	6.1							
▲	1B	7.6	**POORLY GRADED SAND SP**					1.27	3.5
★	1B	9.1						1.67	21.6
⊙	1B	10.7	**POORLY GRADED SAND SP**					1.11	4.6

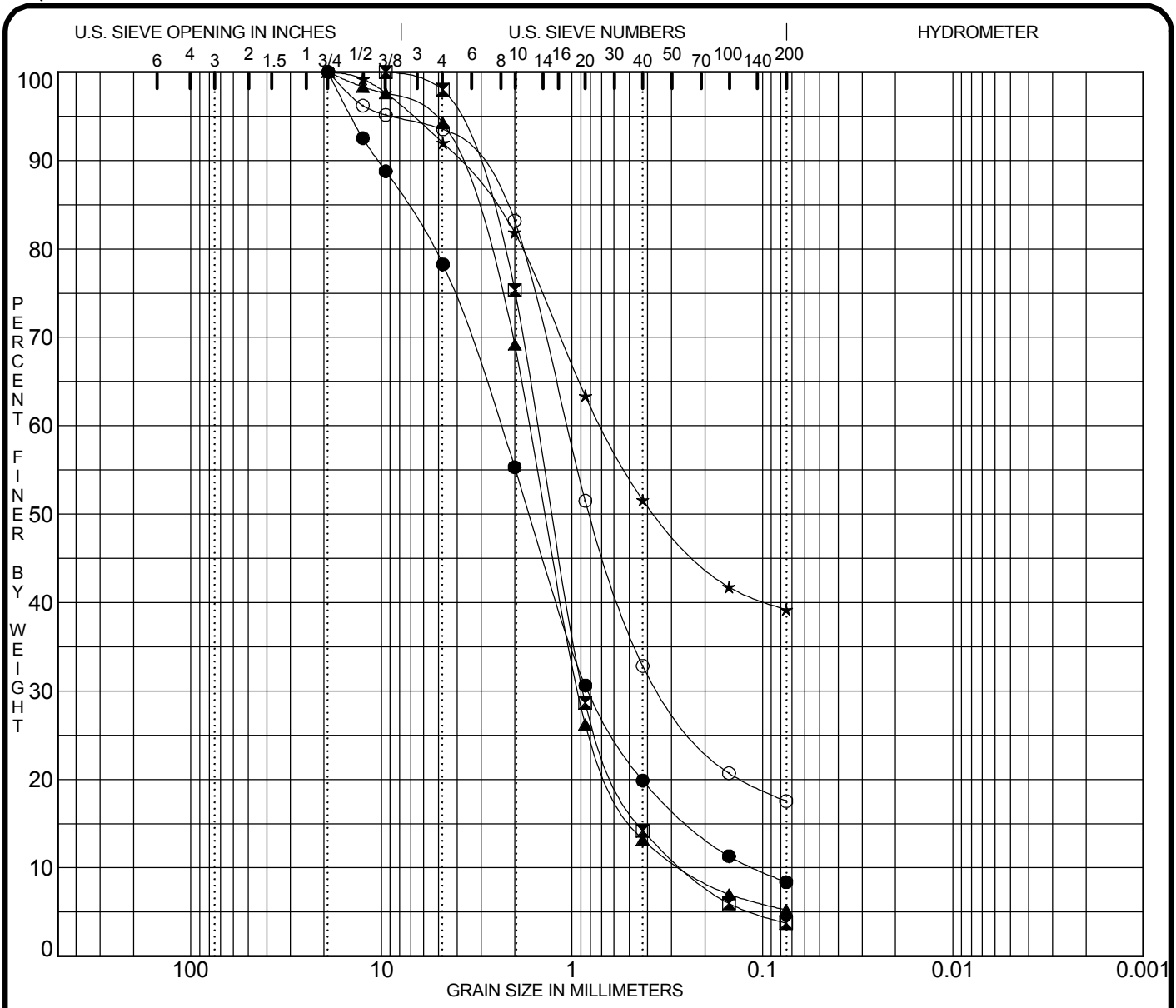
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1B	4.6	0.41	0.80			12.2	52.9	34.9	
⊠	1B	6.1	1.01	1.29	0.468		4.9	80.1	15.1	
▲	1B	7.6	1.55	1.84	1.108	0.5249	1.4	95.4	3.2	
★	1B	9.1	0.80	1.10	0.307		4.3	83.3	12.4	
⊙	1B	10.7	1.75	2.25	1.108	0.4908	12.6	84.3	3.1	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (a)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	1B	12.2						2.54	21.7
⊠	1B	13.7	**WELL-GRADED SAND SW**					2.01	6.0
▲	1B	15.2						2.03	6.7
★	1C	4.6							
⊙	1C	6.1							

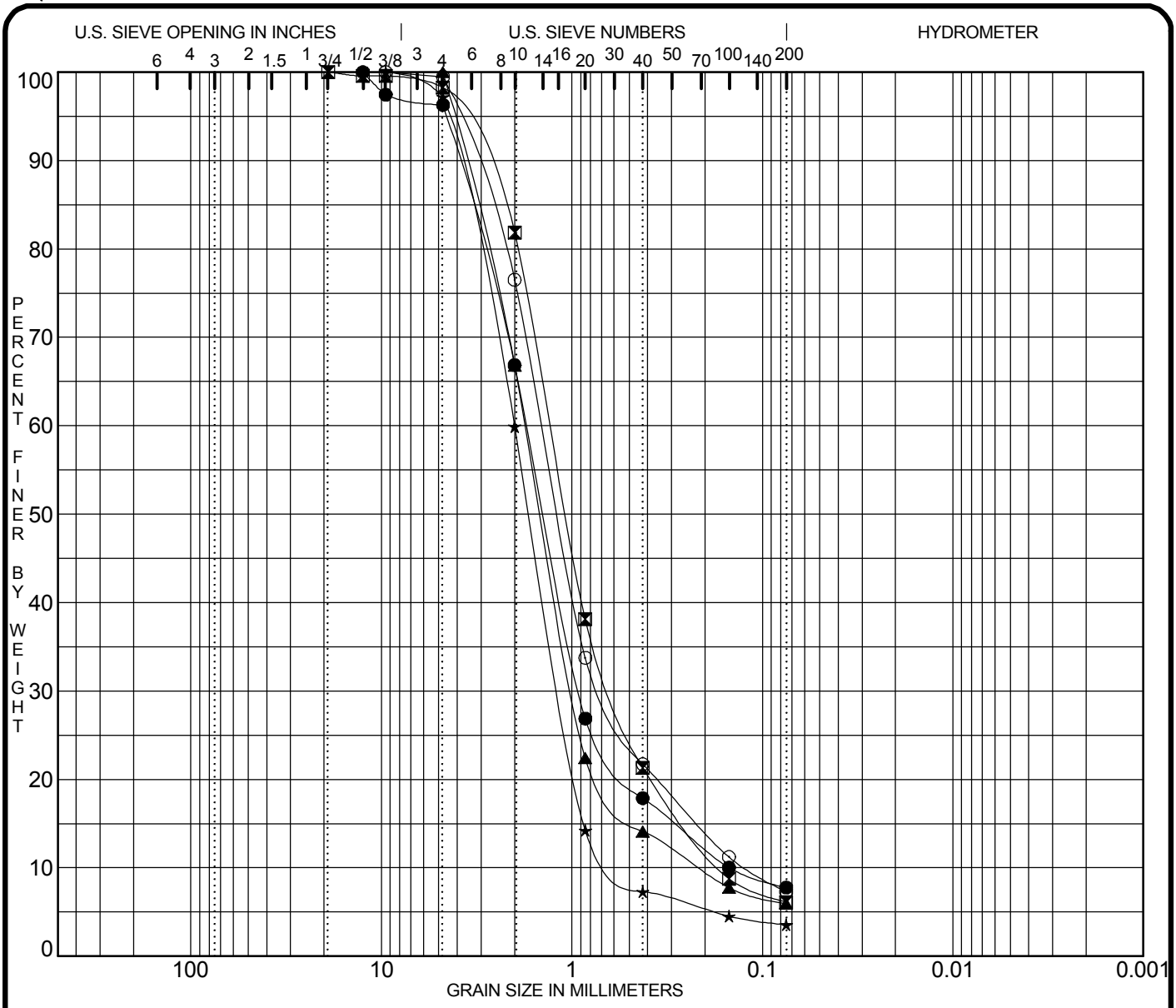
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1B	12.2	1.66	2.39	0.817	0.1100	21.7	69.9	8.4	
⊠	1B	13.7	1.26	1.51	0.871	0.2499	2.0	94.2	3.7	
▲	1B	15.2	1.36	1.67	0.916	0.2479	5.8	89.0	5.2	
★	1C	4.6	0.36	0.70			8.0	52.8	39.2	
⊙	1C	6.1	0.80	1.07	0.333		6.5	76.0	17.5	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (b)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	1C	7.6						3.22	11.6
⊠	1C	9.1						1.71	7.9
▲	1C	10.7						2.54	8.1
★	1C	12.2	**POORLY GRADED SAND SP**					1.17	3.6
⊙	1C	13.7						2.70	11.9

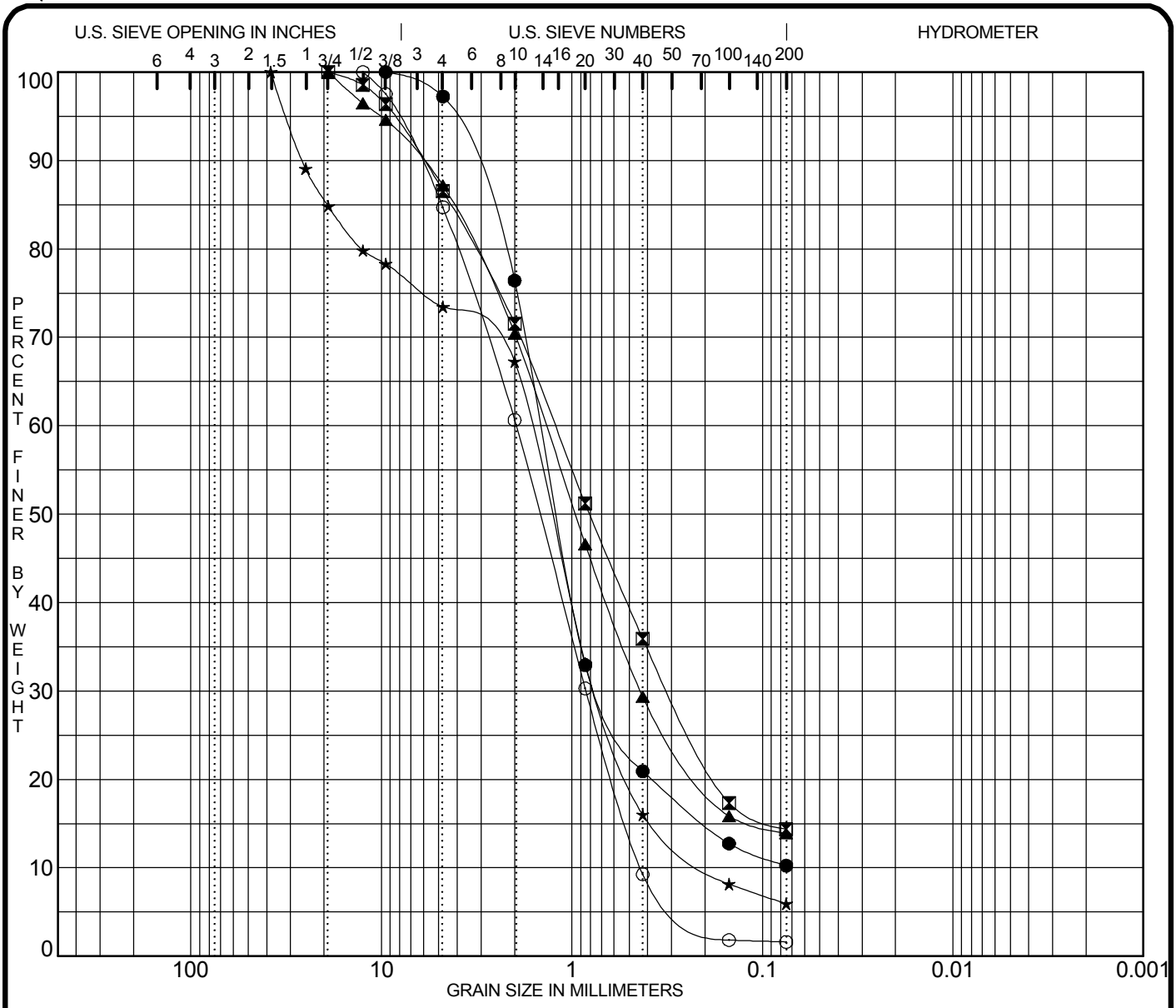
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1C	7.6	1.39	1.73	0.909	0.1484	3.7	88.5	7.8	
⊠	1C	9.1	1.07	1.30	0.608	0.1661	1.7	92.1	6.1	
▲	1C	10.7	1.45	1.75	0.984	0.2172	0.0	94.1	5.9	
★	1C	12.2	1.66	2.00	1.142	0.5569	2.8	93.6	3.6	
⊙	1C	13.7	1.18	1.44	0.685	0.1210	0.5	92.2	7.3	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (c)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	1C	15.2						5.08	20.7
⊠	2B	5.2							
▲	2B	6.1							
★	2B	7.6						1.76	8.7
⊙	2B	9.1	POORLY GRADED SAND with GRAVEL SP					0.83	4.5

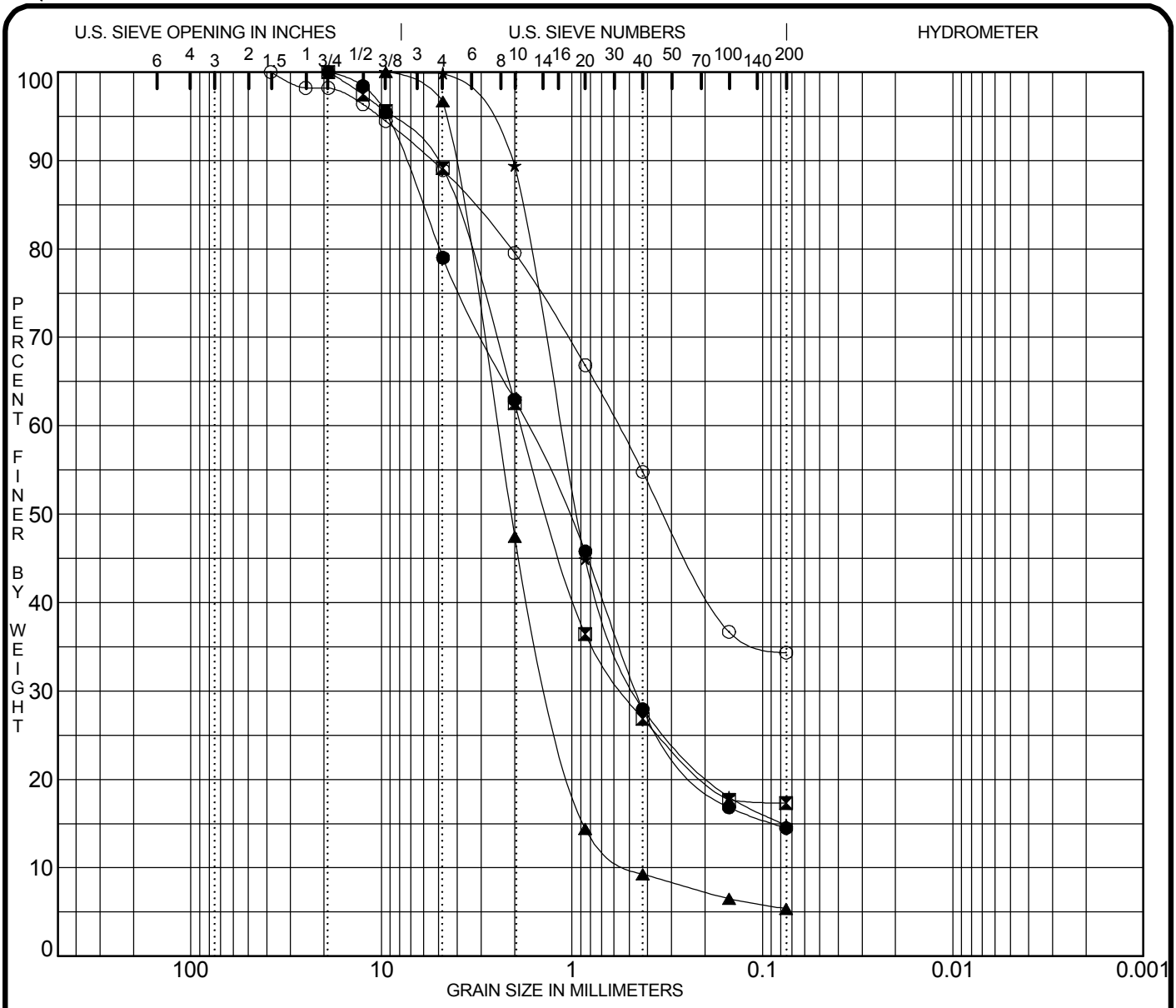
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1C	15.2	1.19	1.45	0.718		2.8	87.0	10.2	
⊠	2B	5.2	0.81	1.23	0.305		13.4	72.2	14.4	
▲	2B	6.1	0.96	1.38	0.436		12.8	73.3	13.9	
★	2B	7.6	1.30	1.67	0.749	0.1915	26.5	67.5	5.9	
⊙	2B	9.1	1.48	1.96	0.842	0.4354	15.3	83.1	1.6	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (d)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	2B	10.7							
⊠	2B	12.2							
▲	2B	13.7						1.38	5.3
★	2B	15.2							
⊙	2C	4.9							

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2B	10.7	1.05	1.73	0.460		21.0	64.5	14.5	
⊠	2B	12.2	1.33	1.84	0.533		10.8	71.9	17.3	
▲	2B	13.7	2.09	2.49	1.273	0.4694	3.3	91.3	5.4	
★	2B	15.2	0.94	1.14	0.461		0.1	85.0	14.8	
⊙	2C	4.9	0.32	0.57			11.1	54.6	34.3	

PROJECT **NMIA Runway Extension - Palisadoes**

JOB NO. **200824**

DATE **18/9/08**

GRADATION CURVES

JETS

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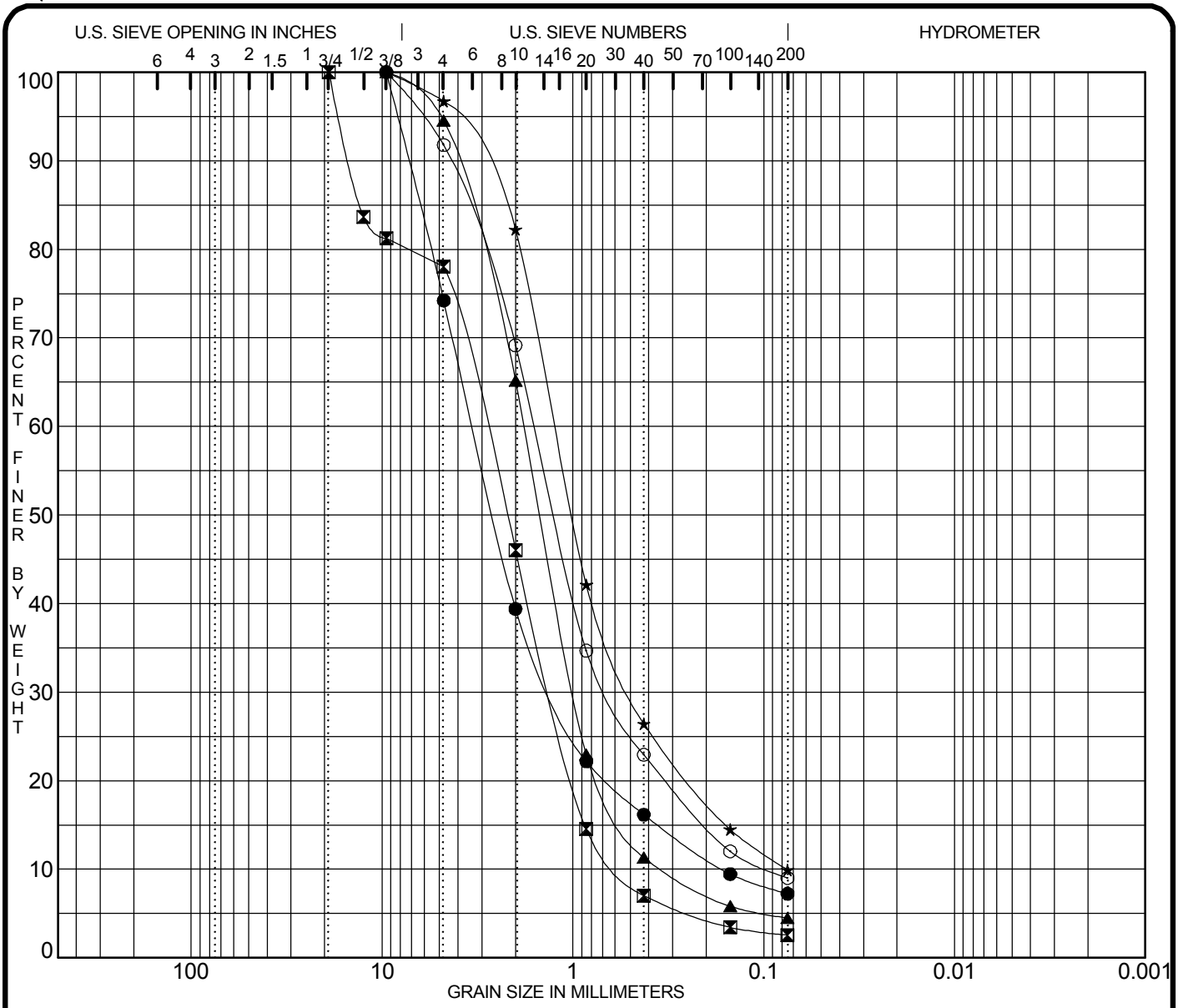
Table 6 - II (e)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	2C	6.1						2.89	20.4
⊠	2C	7.6	POORLY GRADED SAND with GRAVEL SP					1.03	5.2
▲	2C	9.1	POORLY GRADED SAND SP					1.61	5.4
★	2C	10.7						2.62	16.4
⊙	2C	12.2						2.77	16.9

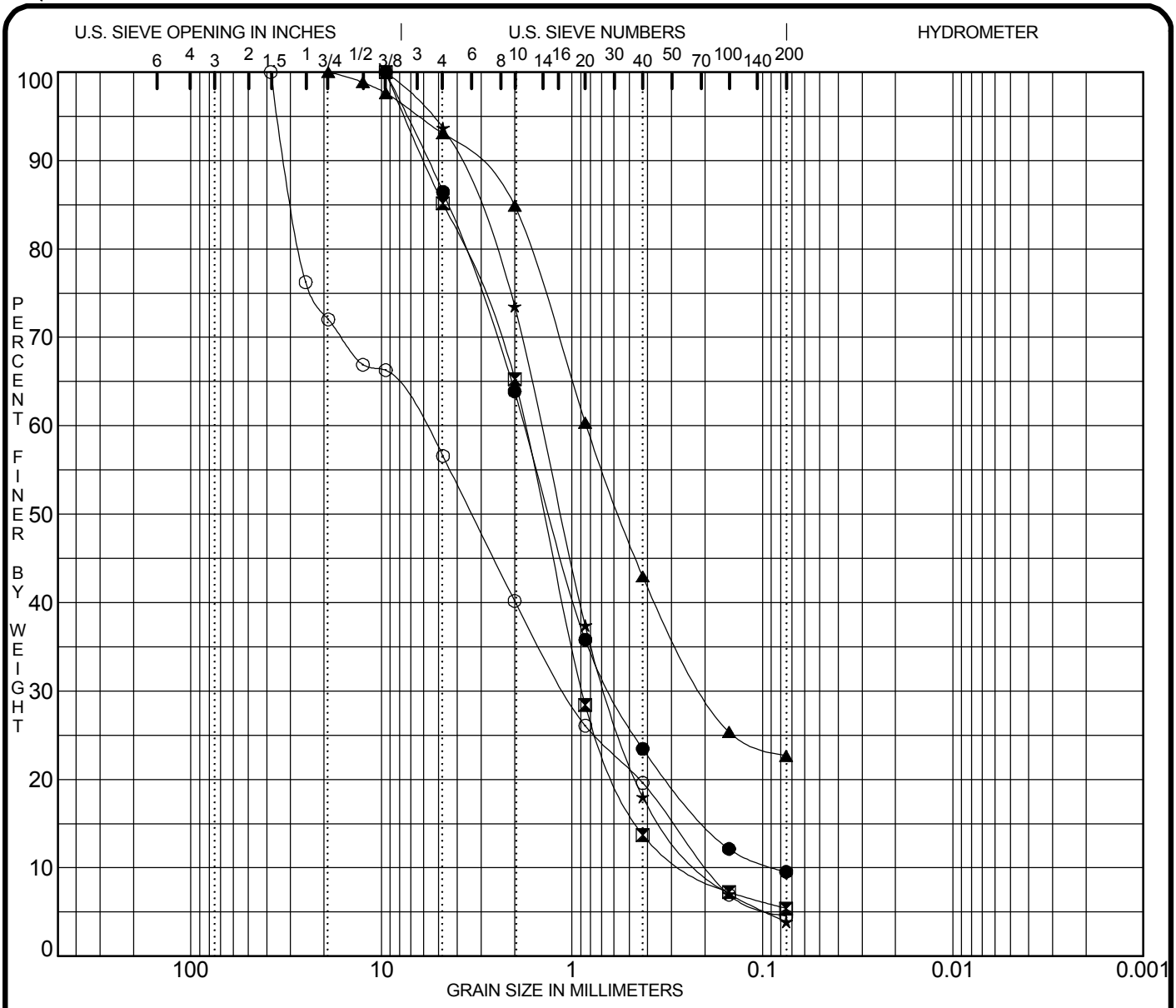
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2C	6.1	2.60	3.34	1.254	0.1633	25.8	67.0	7.2	
⊠	2C	7.6	2.23	2.92	1.294	0.5591	21.9	75.5	2.6	
▲	2C	9.1	1.47	1.80	0.980	0.3309	5.4	90.1	4.5	
★	2C	10.7	1.01	1.24	0.498	0.0758	3.3	86.8	9.9	
⊙	2C	12.2	1.24	1.59	0.645	0.0942	8.2	82.8	9.0	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (f)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	2C	13.7						2.50	21.0
⊠	2C	15.2						1.88	7.6
▲	3A	6.1							
★	3A	7.6	**WELL-GRADED SAND SW**					1.48	7.3
⊙	3A	9.1	**POORLY GRADED SAND with GRAVEL SP**					1.00	31.5

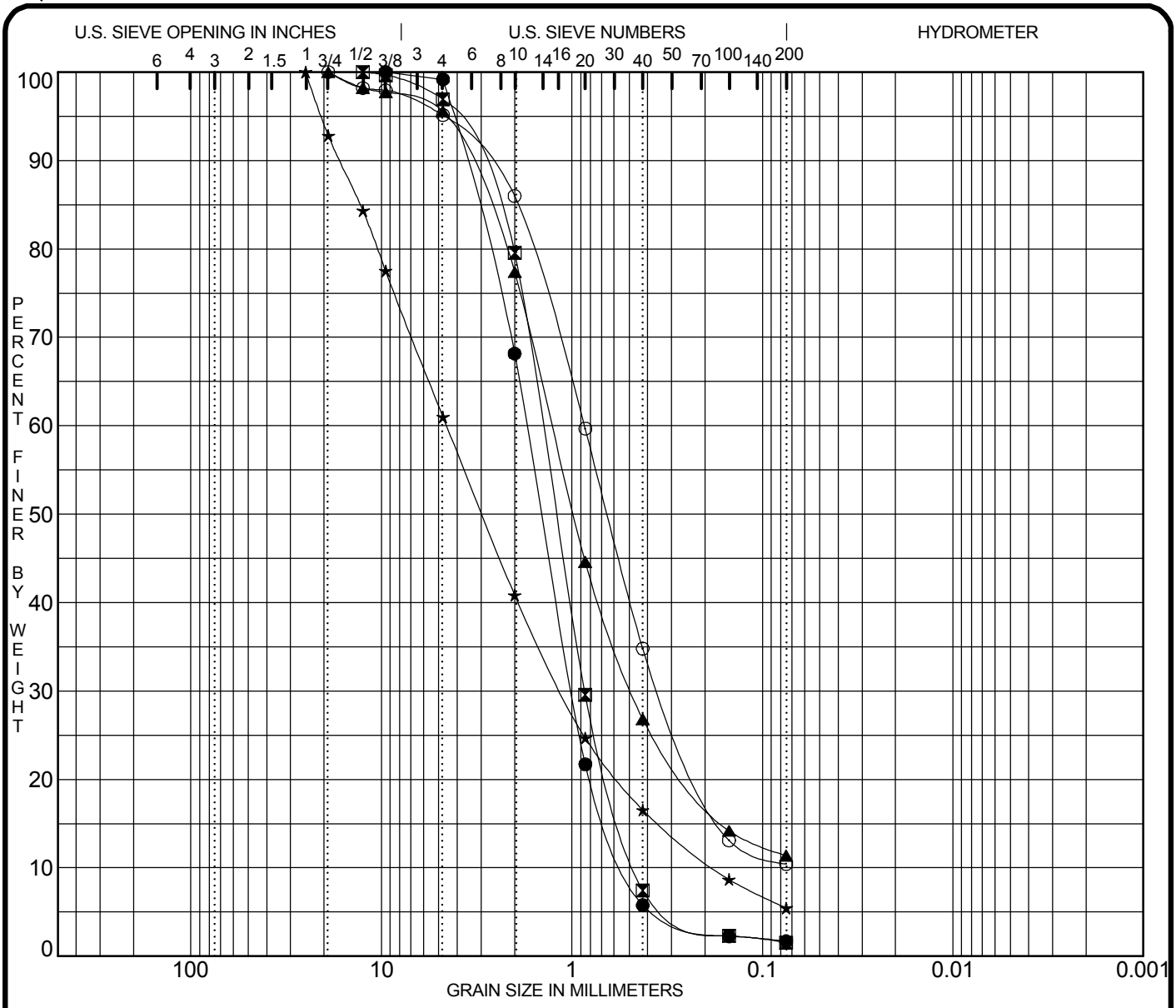
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2C	13.7	1.31	1.78	0.614	0.0848	13.6	76.9	9.5	
⊠	2C	15.2	1.40	1.77	0.881	0.2337	14.8	79.8	5.4	
▲	3A	6.1	0.56	0.84	0.197		6.9	70.4	22.7	
★	3A	7.6	1.15	1.45	0.652	0.1986	6.3	89.8	3.9	
⊙	3A	9.1	3.36	6.06	1.078	0.1926	43.4	52.0	4.5	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (g)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	3A	10.7	**POORLY GRADED SAND SP**					1.12	3.4
⊠	3A	12.2	**POORLY GRADED SAND SP**					1.11	3.1
▲	3A	13.7						3.40	23.7
★	3A	15.2						1.56	25.5
⊙	3C	4.6						1.98	12.8

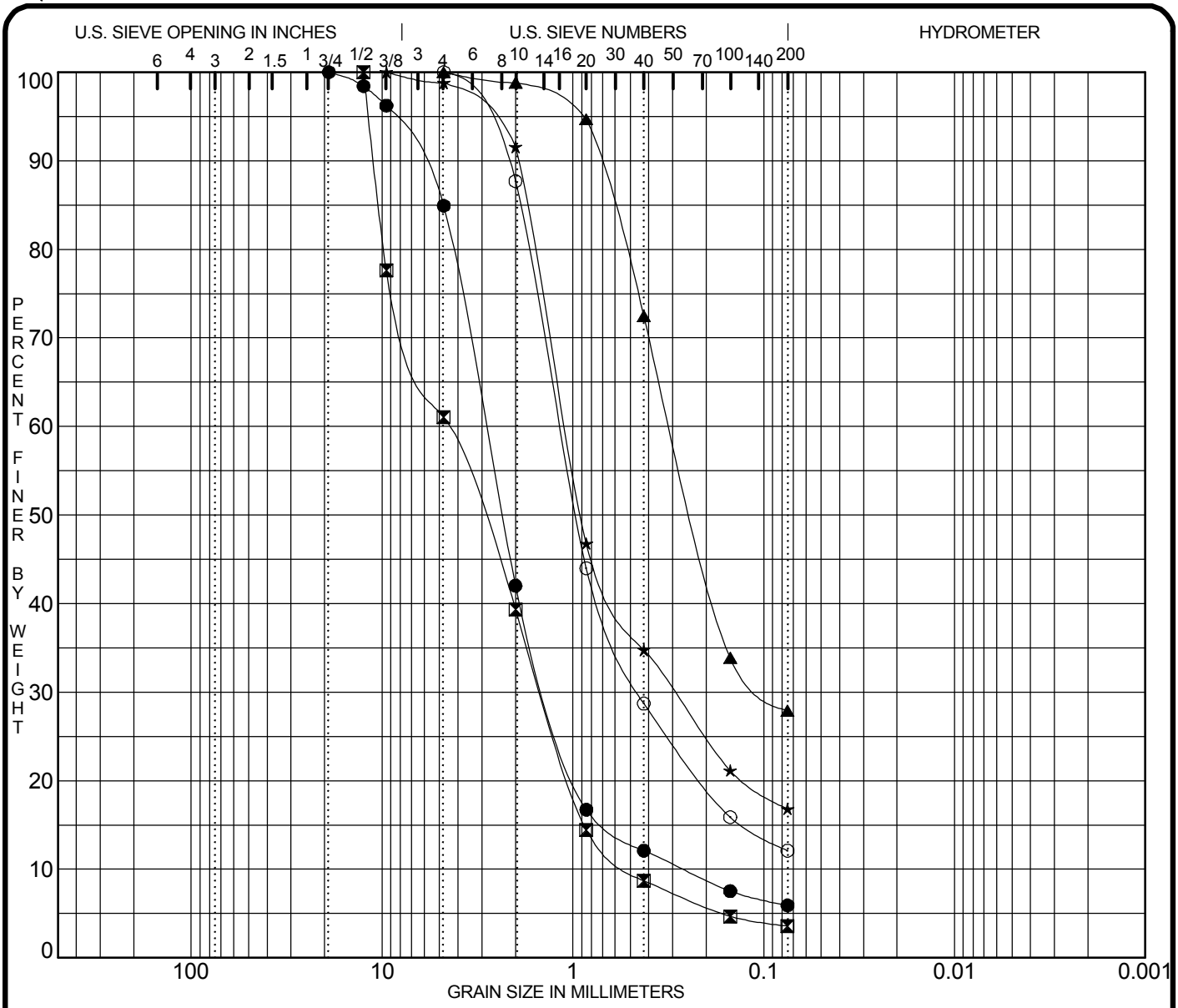
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3A	10.7	1.43	1.72	0.990	0.5109	0.8	97.5	1.7	
⊠	3A	12.2	1.21	1.43	0.856	0.4605	3.1	95.4	1.5	
▲	3A	13.7	0.98	1.27	0.481		4.5	84.2	11.4	
★	3A	15.2	2.96	4.55	1.127	0.1787	39.0	55.5	5.4	
⊙	3C	4.6	0.65	0.86	0.338		4.9	84.7	10.4	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (h)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	3C	6.1						2.34	10.9
⊠	3C	7.6	**POORLY GRADED SAND with GRAVEL SP**					0.93	9.2
▲	3C	9.1							
★	3C	10.7							
⊙	3C	12.2						3.41	22.7

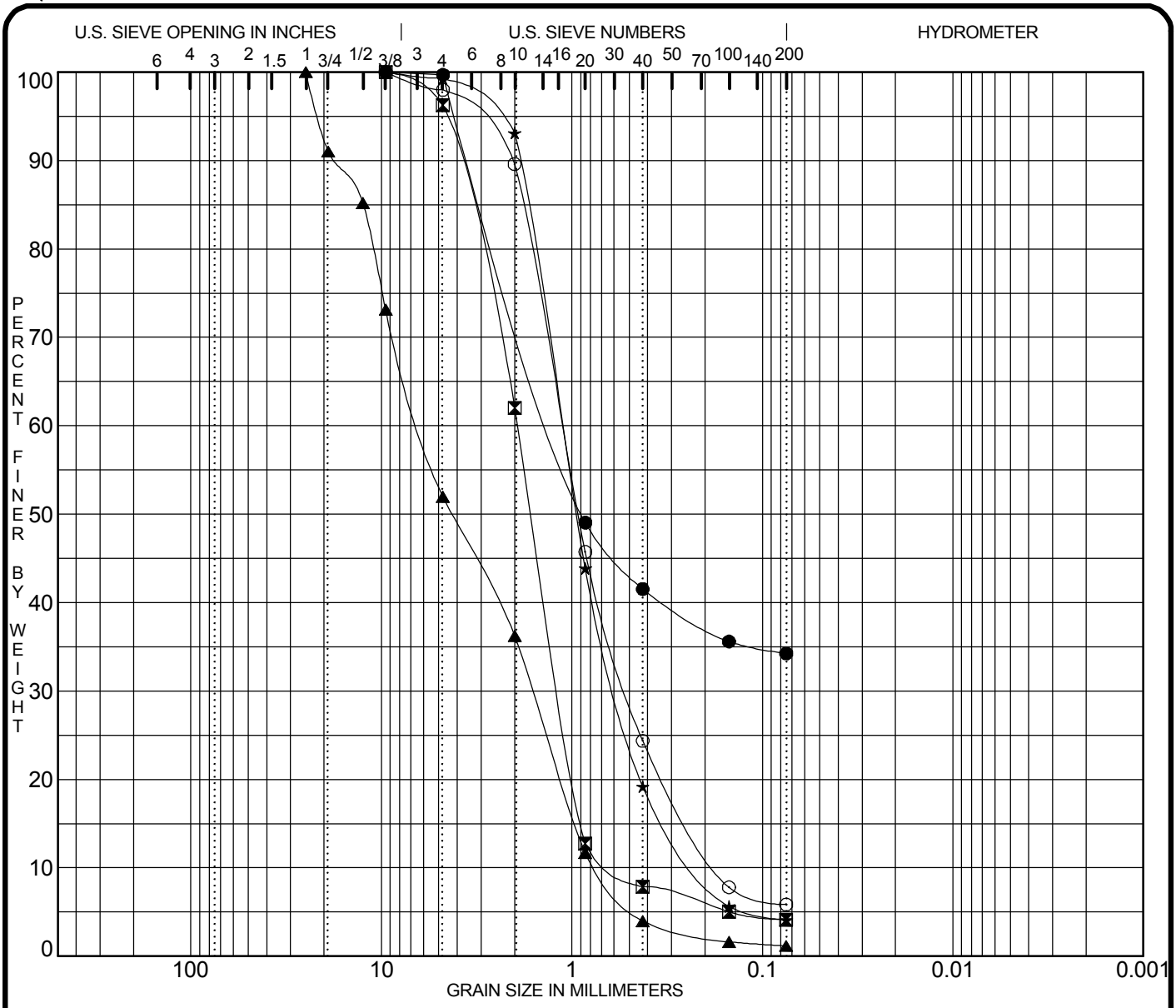
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3C	6.1	2.35	2.87	1.332	0.2636	15.1	79.0	5.9	
⊠	3C	7.6	3.06	4.55	1.450	0.4975	38.9	57.5	3.6	
▲	3C	9.1	0.23	0.30	0.096		0.0	72.1	27.9	
★	3C	10.7	0.90	1.09	0.295		1.2	82.0	16.8	
⊙	3C	12.2	0.96	1.16	0.451		0.0	87.9	12.1	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (i)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	3C	13.7							
⊠	3C	15.2	**POORLY GRADED SAND SP**					1.18	3.3
▲	4B	7.6	**POORLY GRADED SAND with GRAVEL SP**					0.58	8.5
★	4B	9.1	**POORLY GRADED SAND SP**					1.41	5.4
⊙	4B	10.7						1.35	6.5

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	3C	13.7	0.88	1.23			0.3	65.5	34.2	
⊠	3C	15.2	1.62	1.93	1.147	0.5773	3.7	92.1	4.1	
▲	4B	7.6	4.26	6.18	1.610	0.7294	48.0	50.8	1.2	
★	4B	9.1	0.95	1.13	0.576	0.2098	0.7	95.2	4.1	
⊙	4B	10.7	0.92	1.12	0.510	0.1724	2.0	92.1	5.8	

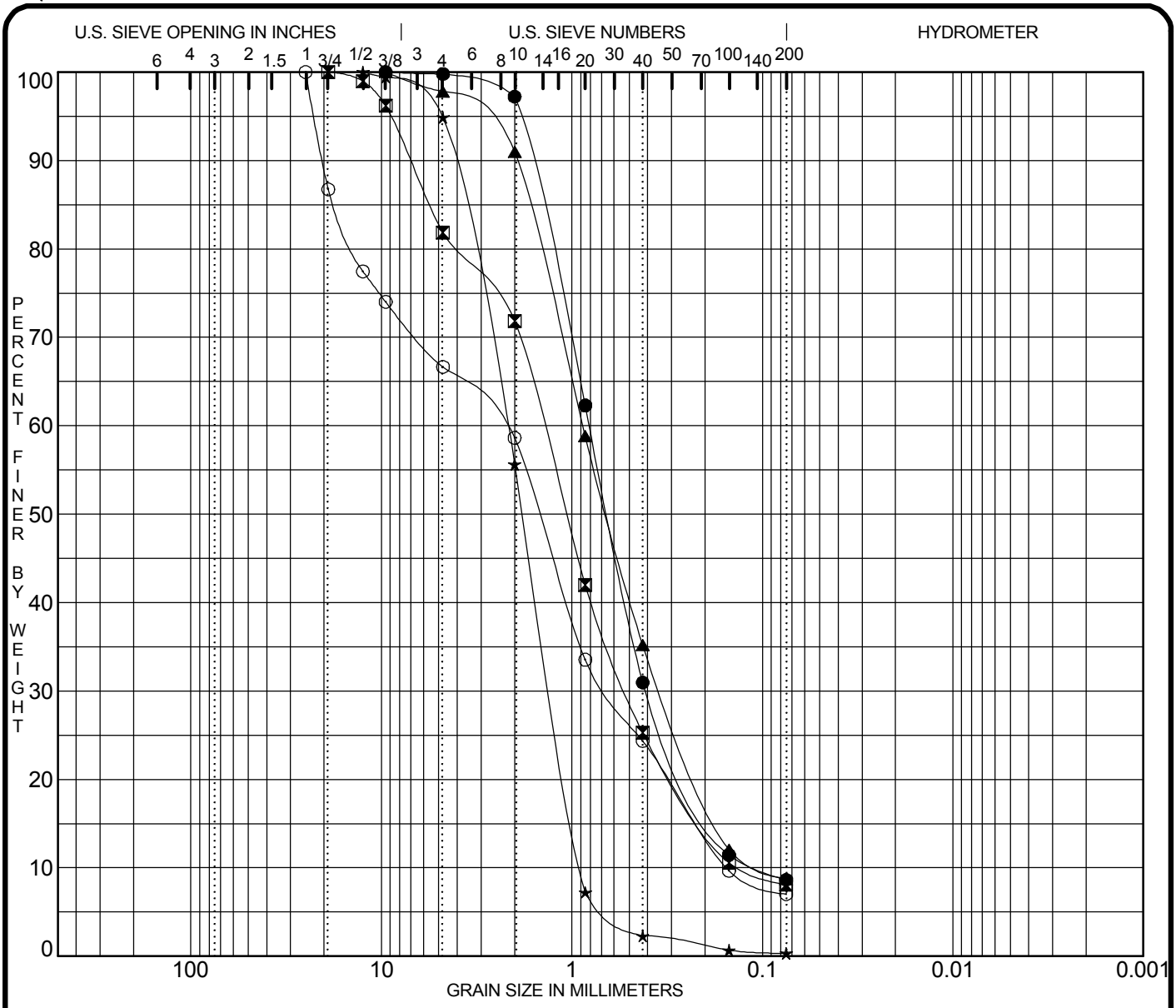
PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (j)

3203:{GRSZLSZ:18-9-08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4B	12.2						1.93	7.7
⊠	4B	13.7						1.47	11.1
▲	4B	15.2						1.33	9.0
★	4C	6.1	**POORLY GRADED SAND SP**					0.82	2.5
⊙	4C	7.6						1.19	15.1

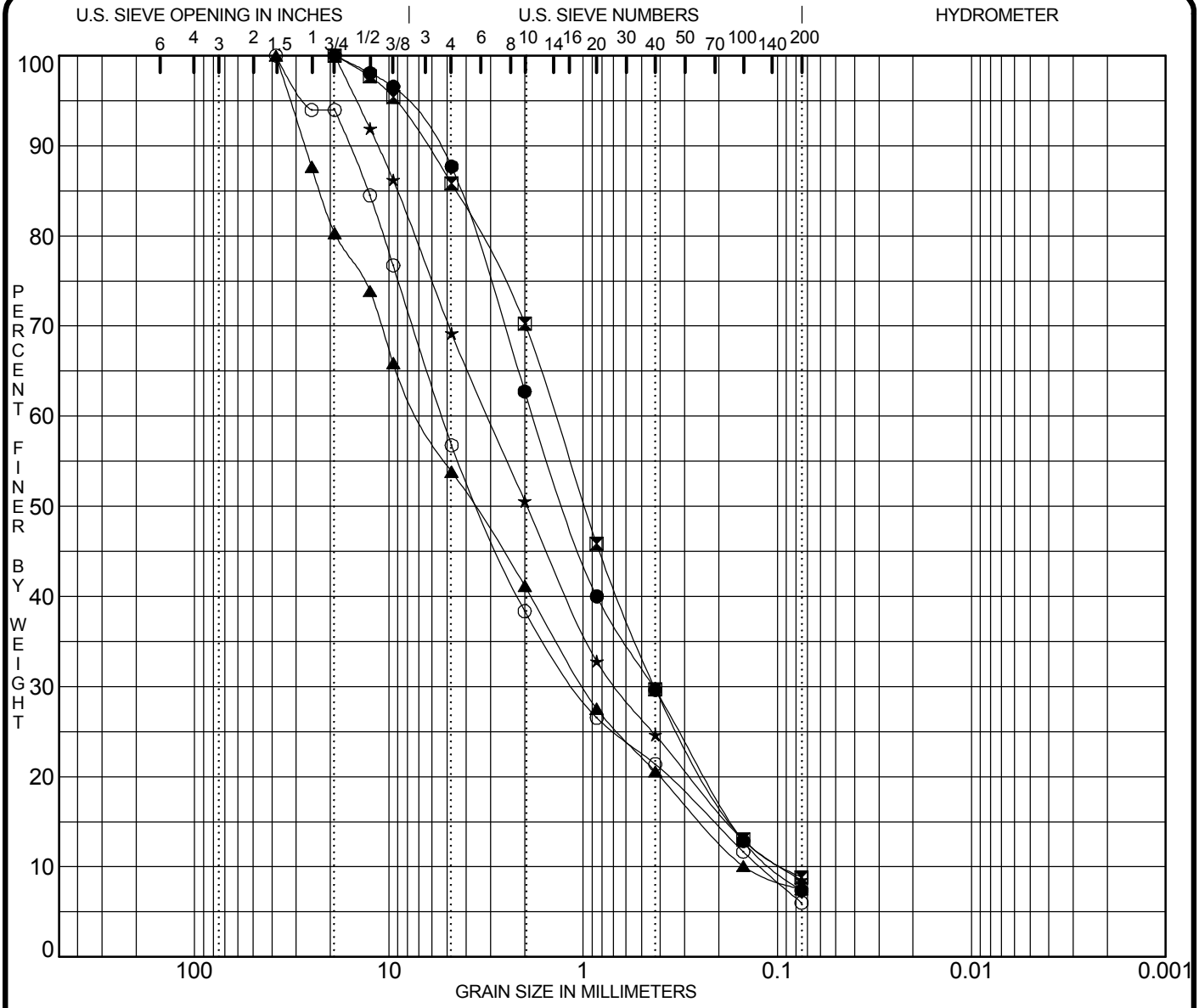
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4B	12.2	0.65	0.81	0.404	0.1046	0.2	91.1	8.6	
⊠	4B	13.7	1.07	1.42	0.517	0.1280	18.1	73.8	8.1	
▲	4B	15.2	0.66	0.88	0.336	0.0973	2.2	89.1	8.7	
★	4C	6.1	1.81	2.20	1.271	0.8927	5.1	94.6	0.3	
⊙	4C	7.6	1.49	2.32	0.651	0.1537	33.3	59.6	7.0	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (k)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4C	9.1						1.01	17.3
⊠	4C	10.7						1.46	15.3
▲	4C	12.2						0.99	46.3
★	4C	13.7						1.54	32.8
⊙	4C	15.2						1.84	43.5

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4C	9.1	1.24	1.80	0.436	0.1046	12.3	80.3	7.4	
⊠	4C	10.7	0.98	1.40	0.431	0.0910	14.2	77.0	8.8	
▲	4C	12.2	3.66	6.78	0.991	0.1464	46.2	46.3	7.5	
★	4C	13.7	1.95	3.10	0.670	0.0944	30.8	60.7	8.5	
⊙	4C	15.2	3.46	5.32	1.092	0.1222	43.2	50.8	6.0	

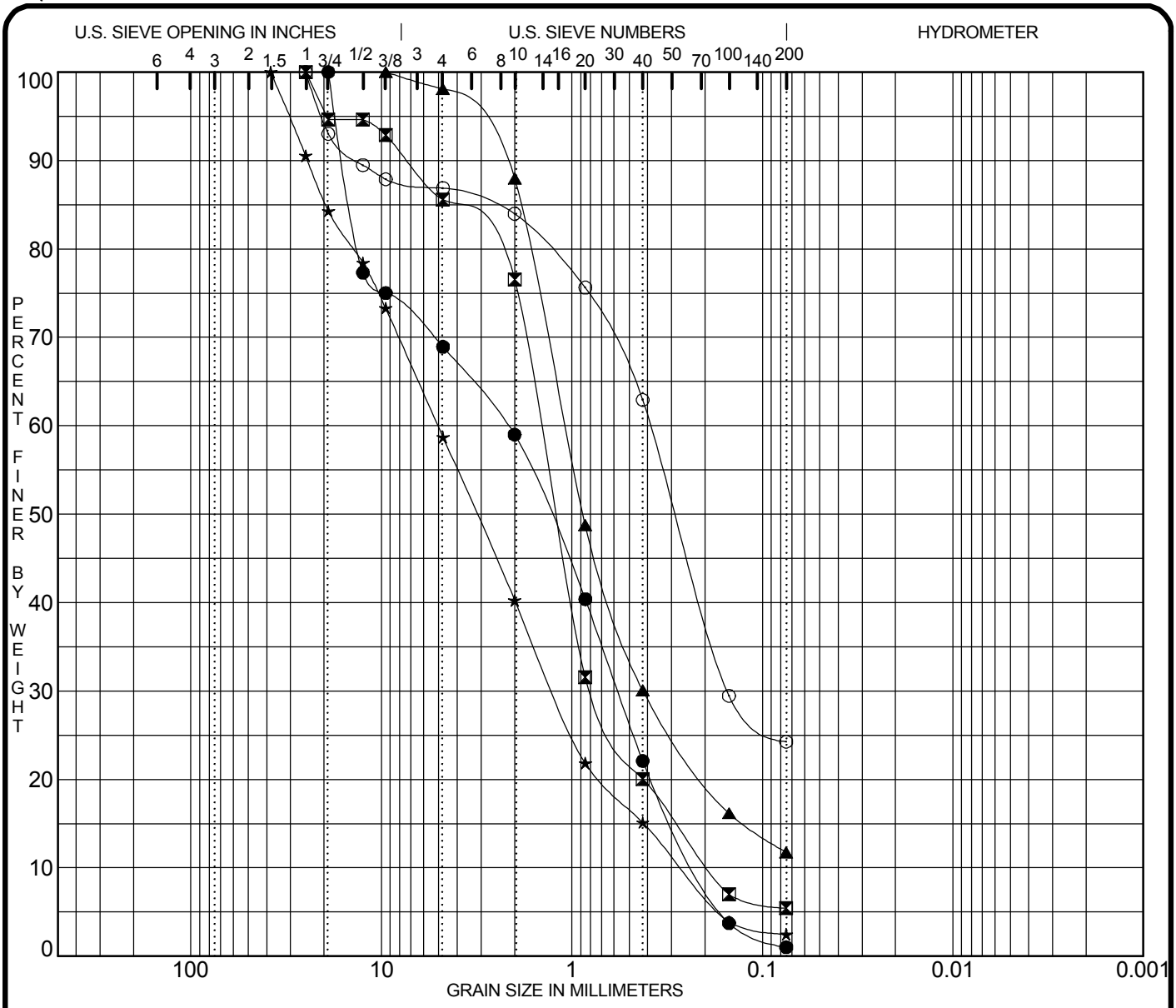
PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (I)

3203:{GRSZLSZ:18-9-08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4D	4.6	**POORLY GRADED SAND with GRAVEL SP**					**0.70**	**10.2**
⊠	4D	6.1						**2.15**	**7.7**
▲	4D	7.6						**2.90**	**19.1**
★	4D	9.1	**WELL-GRADED SAND with GRAVEL SW**					**1.15**	**19.1**
⊙	4D	10.7							

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4D	4.6	**1.32**	**2.18**	**0.574**	**0.2140**	**31.1**	**67.9**	**1.0**	
⊠	4D	6.1	**1.21**	**1.46**	**0.774**	**0.1907**	**14.4**	**80.1**	**5.4**	
▲	4D	7.6	**0.87**	**1.09**	**0.423**		**1.9**	**86.4**	**11.8**	
★	4D	9.1	**3.16**	**5.05**	**1.242**	**0.2648**	**41.3**	**56.2**	**2.5**	
⊙	4D	10.7	**0.28**	**0.39**	**0.153**		**13.1**	**62.6**	**24.3**	

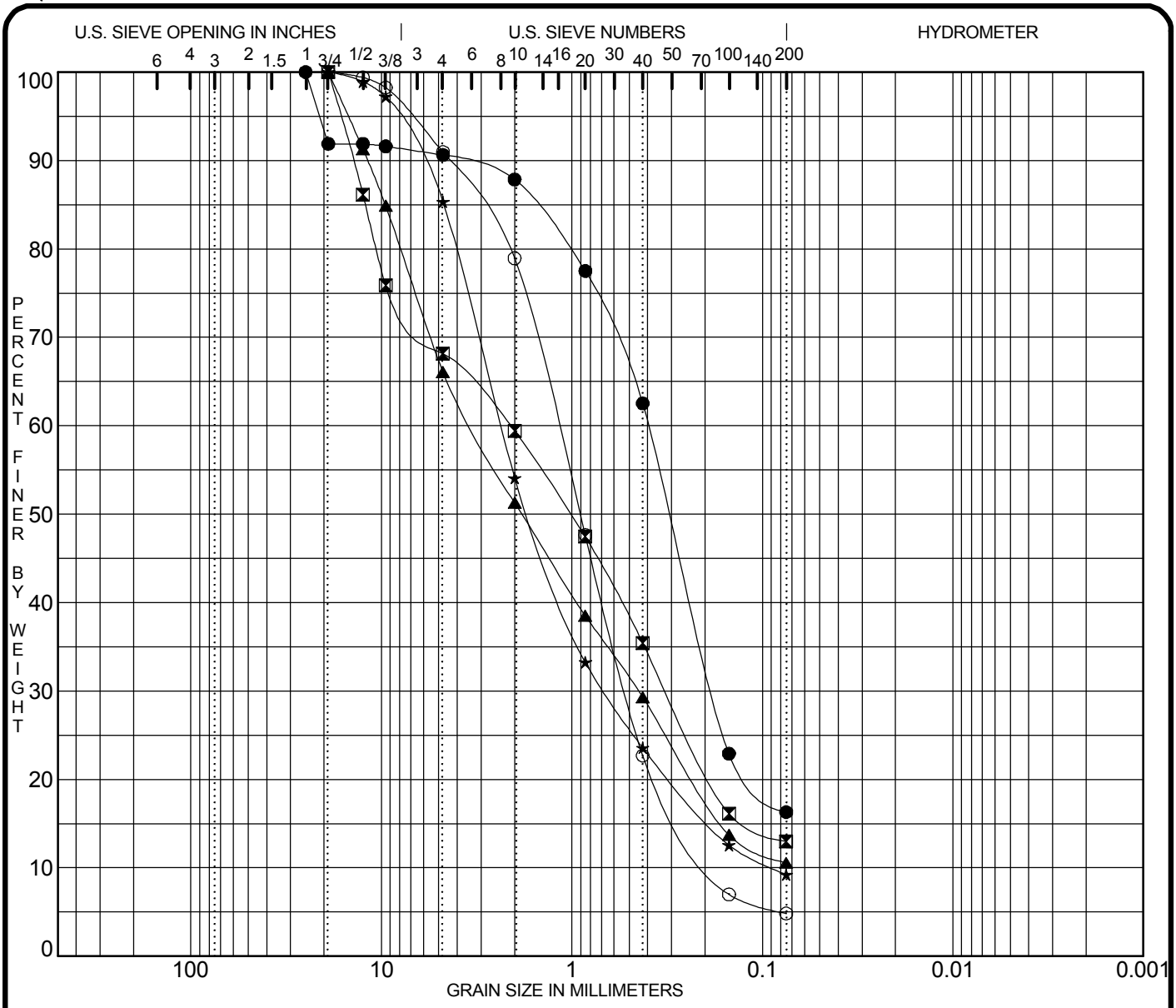
PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (m)

3203:{GRSZLSZ:18-9-08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4D	12.2							
⊠	4D	13.7							
▲	4D	15.2						0.91	50.4
★	4E	4.6						2.19	26.8
⊙	4E	6.1	**WELL-GRADED SAND SW**					1.24	6.5

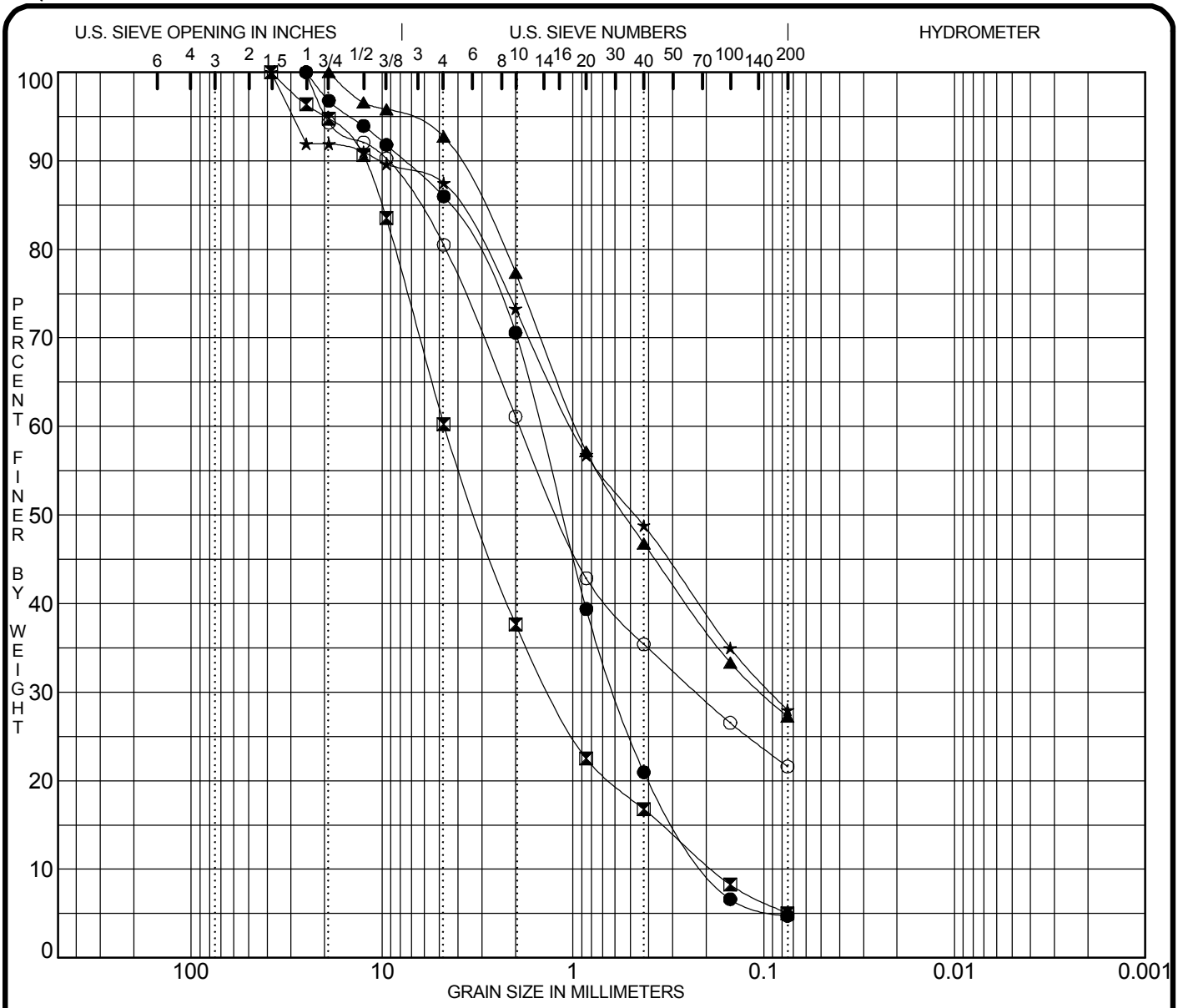
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4D	12.2	0.31	0.40	0.181		9.4	74.3	16.3	
⊠	4D	13.7	1.02	2.12	0.317		31.9	55.2	13.0	
▲	4D	15.2	1.83	3.33	0.448		33.9	55.5	10.6	
★	4E	4.6	1.69	2.36	0.673	0.0880	14.7	76.1	9.2	
⊙	4E	6.1	0.91	1.19	0.521	0.1832	9.0	86.1	4.8	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (n)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4E	7.6	**WELL-GRADED SAND SW**					**1.24**	**7.8**
⊠	4E	9.1						**1.93**	**25.3**
▲	4E	10.7							
★	4E	12.2							
⊙	4E	13.7							

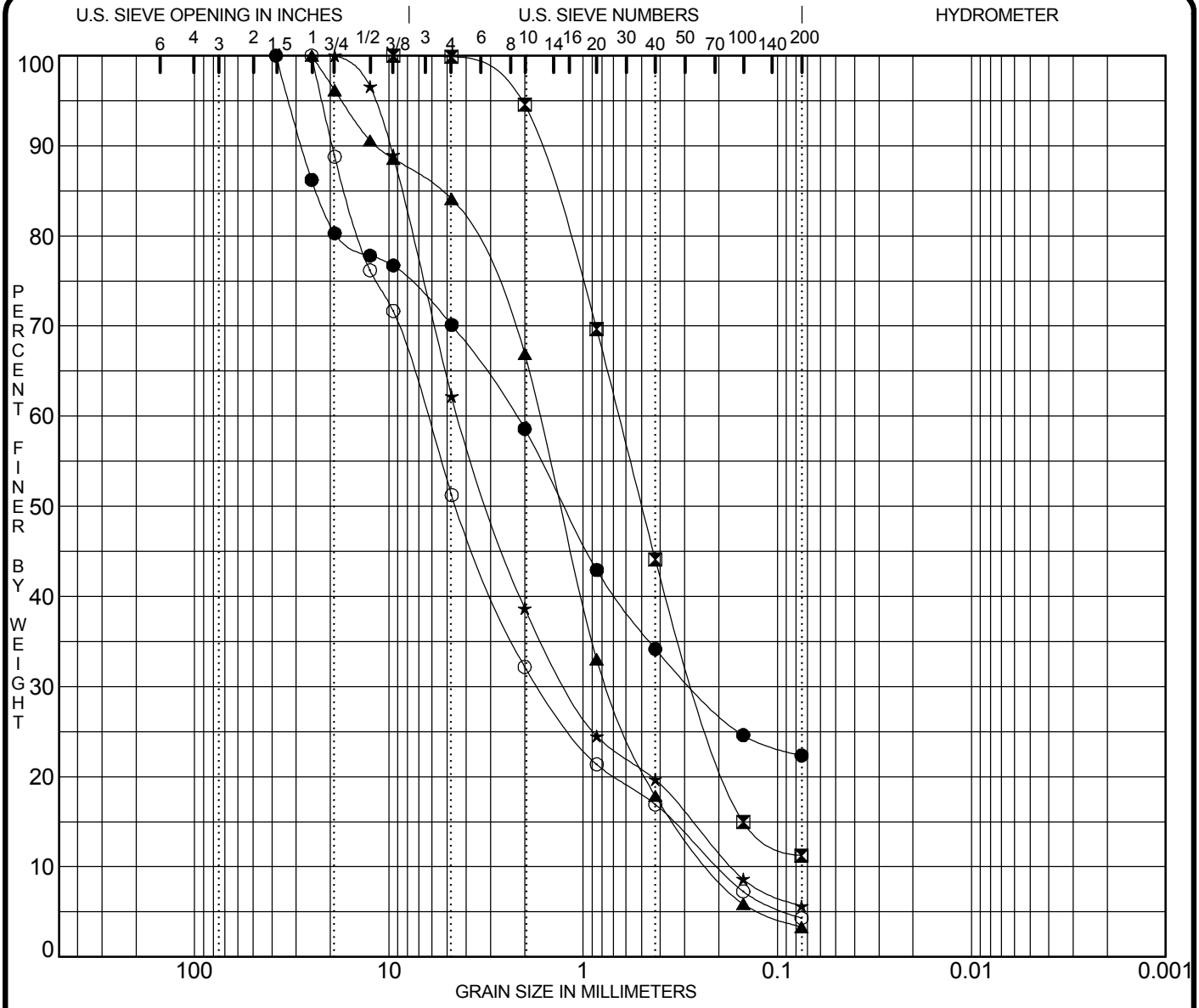
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4E	7.6	**1.14**	**1.50**	**0.597**	**0.1918**	**14.0**	**81.2**	**4.7**	
⊠	4E	9.1	**3.21**	**4.70**	**1.299**	**0.1856**	**39.7**	**55.2**	**5.0**	
▲	4E	10.7	**0.53**	**0.96**	**0.103**		**7.3**	**65.5**	**27.2**	
★	4E	12.2	**0.47**	**1.00**	**0.092**		**12.5**	**59.5**	**28.0**	
⊙	4E	13.7	**1.19**	**1.90**	**0.226**		**19.5**	**58.9**	**21.6**	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (o)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4E	15.2							
⊠	4G	4.6						1.69	11.0
▲	4G	6.1	WELL-GRADED SAND with GRAVEL SW					1.52	7.8
★	4G	7.6						1.88	25.7
⊙	4G	9.1	WELL-GRADED GRAVEL with SAND GW					2.20	31.8

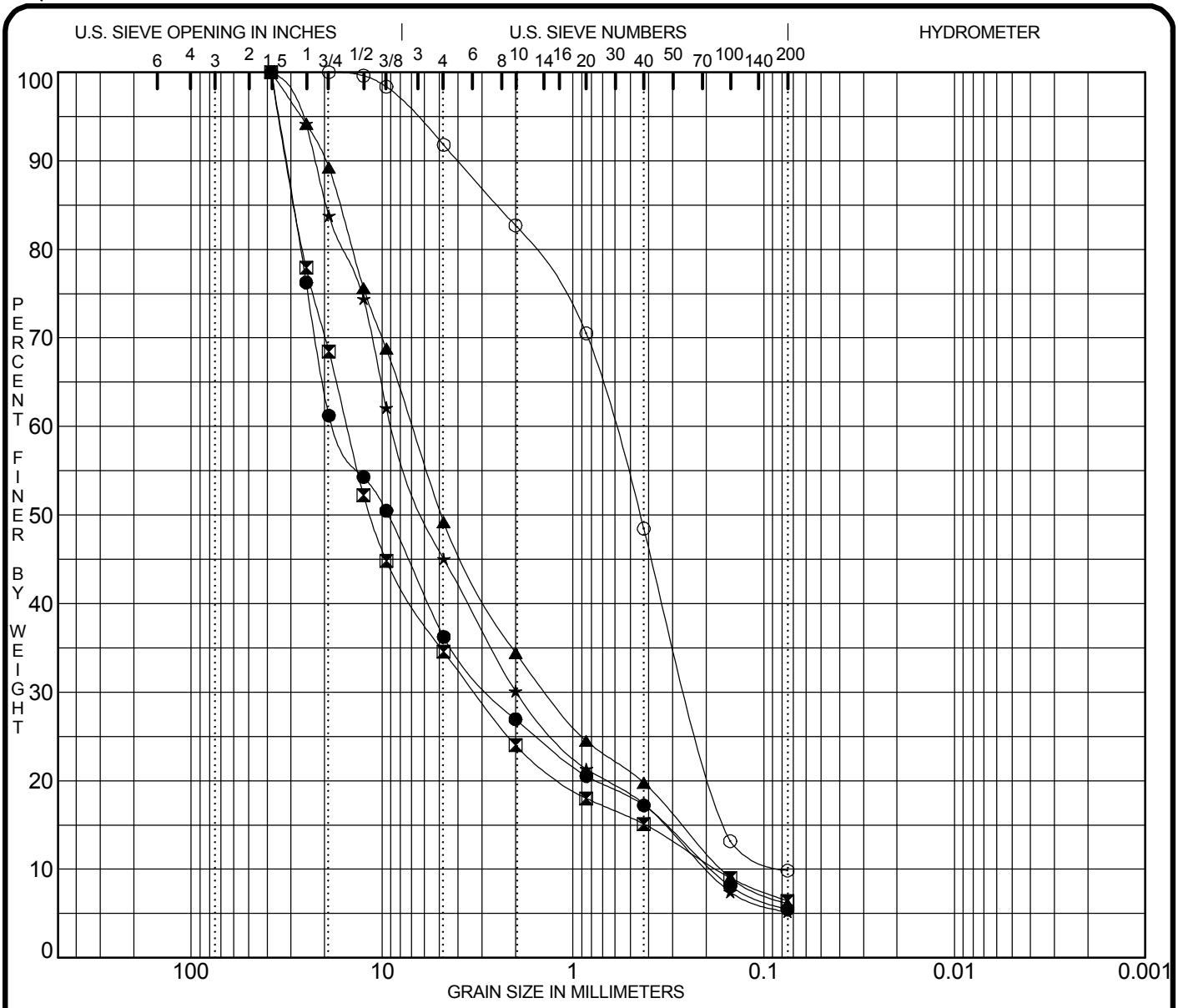
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4E	15.2	1.25	2.22	0.270		29.9	47.8	22.3	
⊠	4G	4.6	0.50	0.65	0.257		0.1	88.6	11.2	
▲	4G	6.1	1.31	1.68	0.740	0.2145	15.9	80.8	3.3	
★	4G	7.6	3.03	4.38	1.186	0.1706	37.8	56.5	5.7	
⊙	4G	9.1	4.49	6.39	1.684	0.2013	48.8	46.9	4.3	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (p)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	4G	10.7						2.15	94.7
⊠	4G	12.2						3.95	86.2
▲	4G	13.7						1.63	42.3
★	4G	15.2						2.29	44.5
⊙	5F	3.7						1.28	7.9

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	4G	10.7	9.28	17.66	2.661	0.1864	63.8	30.8	5.5	
⊠	4G	12.2	11.51	15.27	3.271	0.1772	65.5	28.2	6.4	
▲	4G	13.7	4.89	6.96	1.365	0.1646	50.8	43.1	6.1	
★	4G	15.2	5.81	8.72	1.981	0.1962	55.0	39.9	5.2	
⊙	5F	3.7	0.45	0.61	0.247	0.0775	8.2	81.9	9.8	

PROJECT **NMIA Runway Extension - Palisadoes**

JOB NO. **200824**

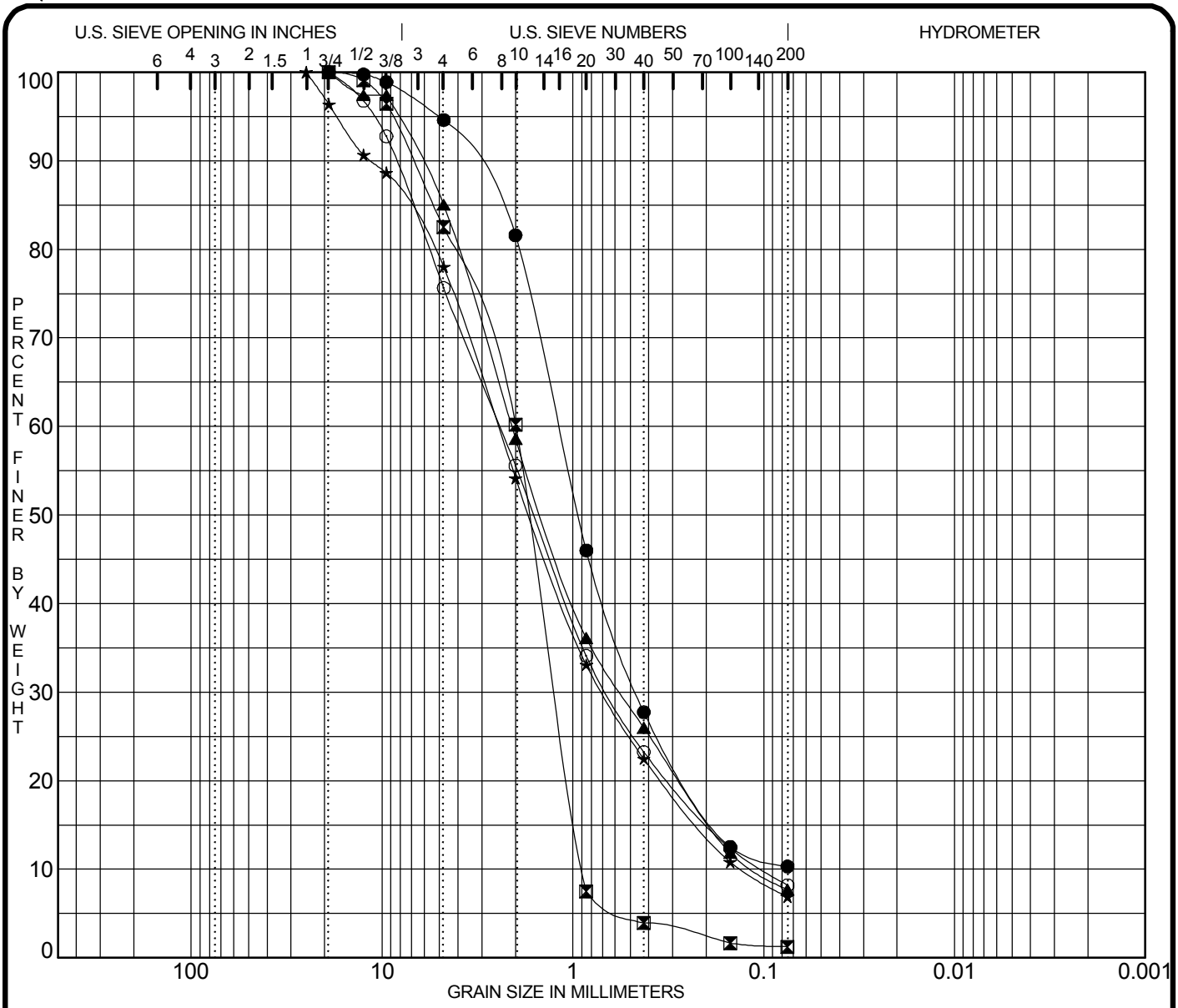
DATE **18/9/08**

GRADATION CURVES

JETS

Kingston

Table 6 - II (q)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	5F	4.6						2.65	17.5
⊠	5F	6.1	**POORLY GRADED SAND with GRAVEL SP**					0.85	2.3
▲	5F	7.6						1.36	19.0
★	5F	9.1						1.51	19.1
⊙	5F	10.7						1.75	23.9

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	5F	4.6	0.94	1.19	0.463		5.4	84.3	10.3	
⊠	5F	6.1	1.69	1.99	1.225	0.8854	17.5	81.2	1.3	
▲	5F	7.6	1.44	2.09	0.560	0.1102	15.0	77.3	7.7	
★	5F	9.1	1.69	2.47	0.695	0.1296	22.0	71.1	6.9	
⊙	5F	10.7	1.60	2.42	0.655	0.1014	24.4	67.4	8.2	

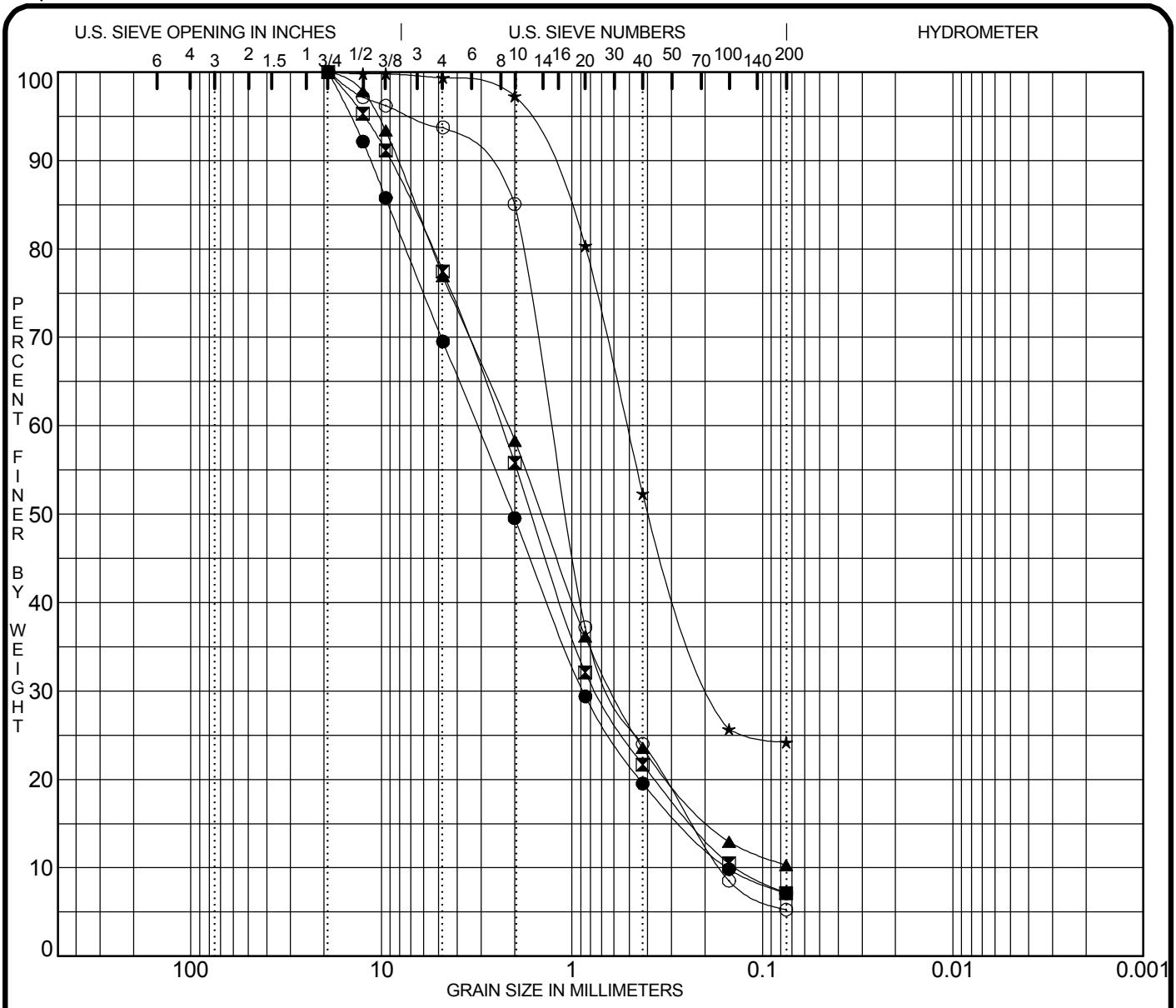
PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (r)

3203:{GRSZLSZ:18-9-08



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	5F	12.2						1.59	20.6
⊠	5F	13.7						1.70	17.4
▲	5F	15.2						2.45	31.2
★	5G	4.6							
⊙	5G	6.1						1.61	7.7

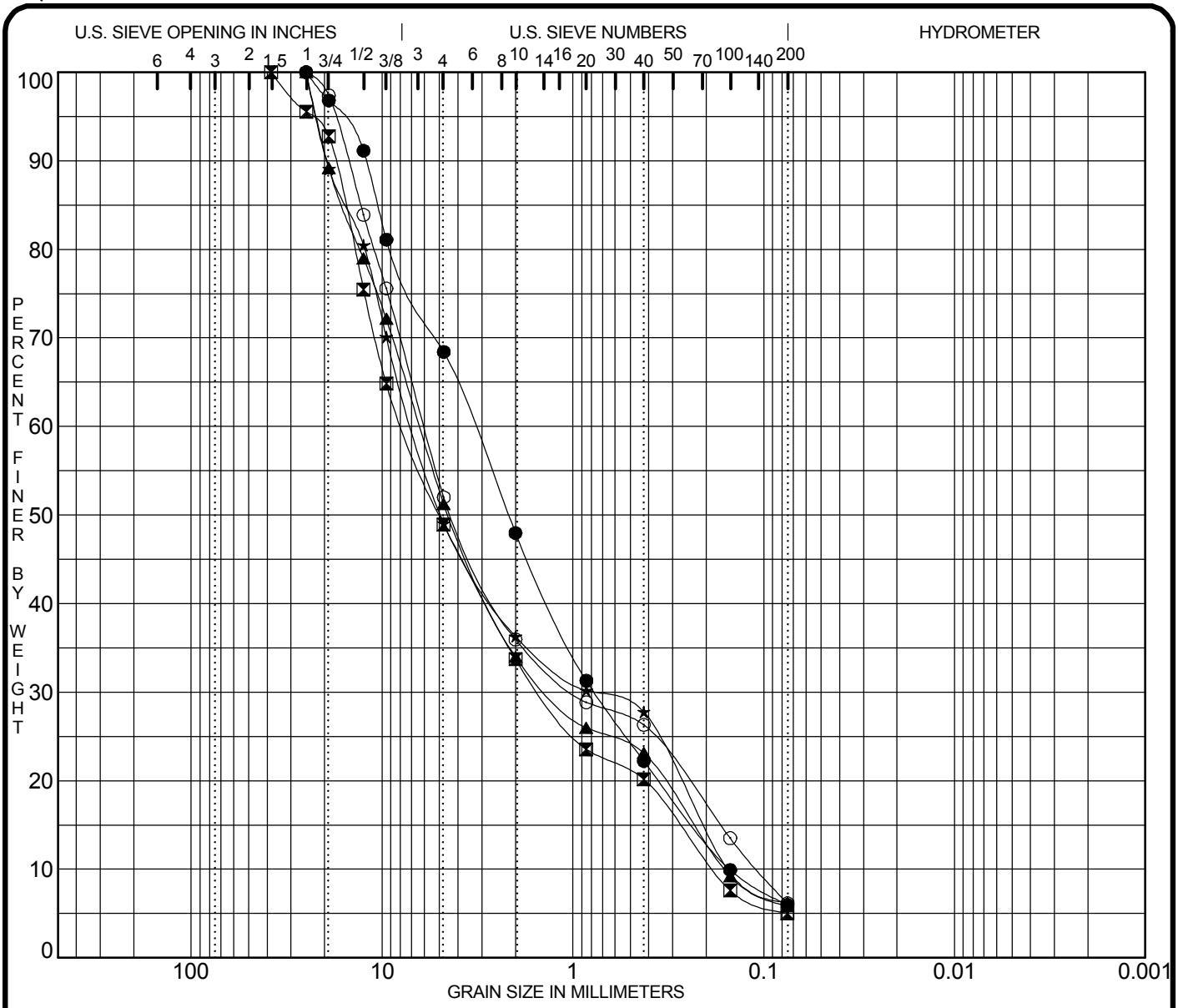
	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	5F	12.2	2.04	3.15	0.872	0.1524	30.5	62.4	7.1	
⊠	5F	13.7	1.62	2.37	0.738	0.1357	22.5	70.3	7.1	
▲	5F	15.2	1.45	2.16	0.606		23.1	66.6	10.3	
★	5G	4.6	0.39	0.51	0.178		0.6	75.2	24.2	
⊙	5G	6.1	1.07	1.28	0.583	0.1654	6.3	88.5	5.3	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (s)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	5G	7.6						1.18	22.0
⊠	5G	9.1						1.52	42.1
▲	5G	10.7						1.69	39.9
★	5G	12.2						0.62	44.3
⊙	5G	13.7						1.47	55.8

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	5G	7.6	2.18	3.33	0.770	0.1511	31.6	62.4	6.0	
⊠	5G	9.1	4.98	7.70	1.464	0.1829	51.1	43.9	5.0	
▲	5G	10.7	4.47	6.35	1.309	0.1593	48.8	45.4	5.8	
★	5G	12.2	4.90	6.81	0.806	0.1539	51.0	42.8	6.3	
⊙	5G	13.7	4.27	6.01	0.977	0.1078	48.0	45.8	6.2	

PROJECT **NMIA Runway Extension - Palisadoes** JOB NO. **200824**
DATE **18/9/08**

GRADATION CURVES

JETS
Kingston

Table 6 - II (t)

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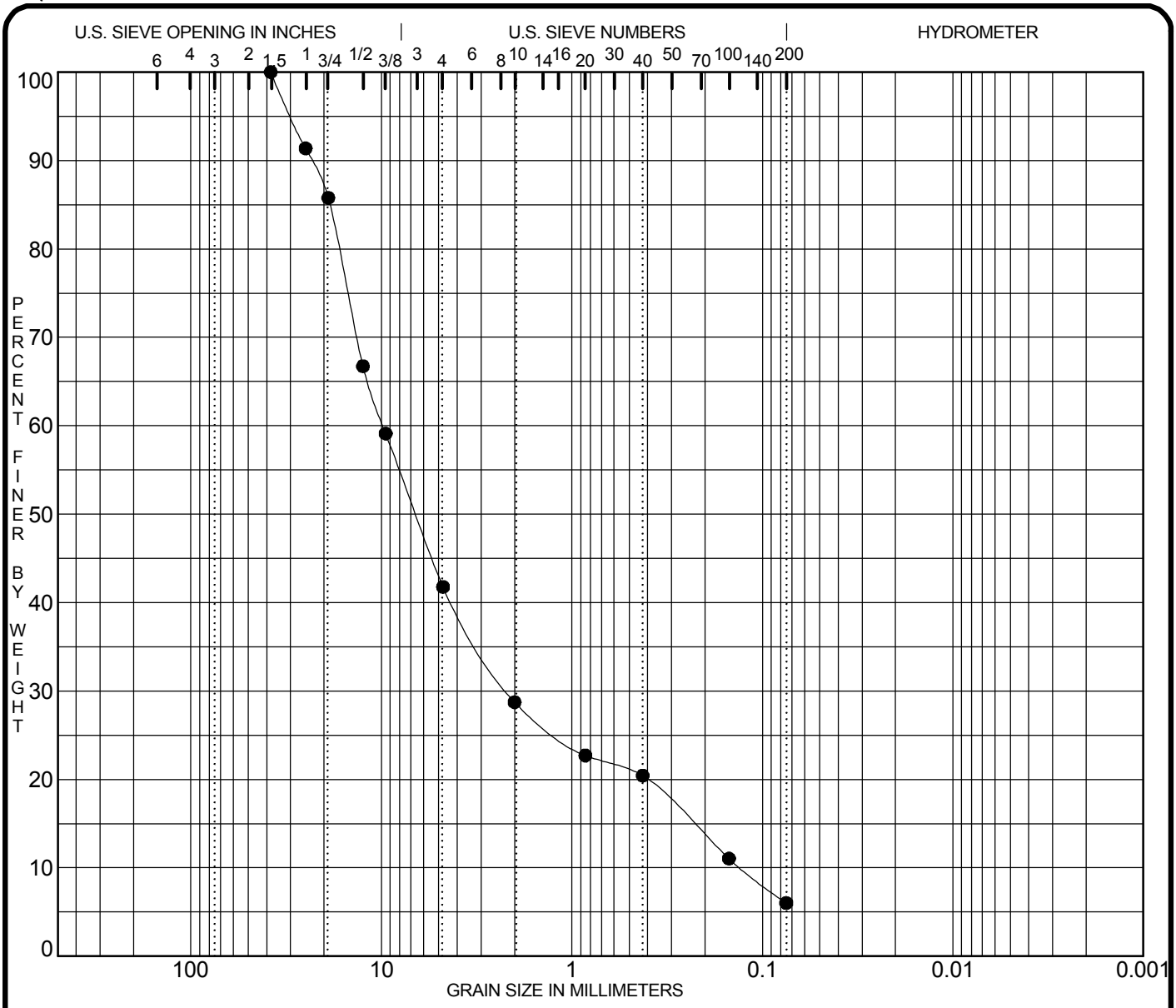

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	**5G**	**15.2**						**3.71**	**75.5**

	Specimen Identification		D50	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**5G**	**15.2**	**6.60**	**9.81**	**2.176**	**0.1299**	**58.2**	**35.8**	**6.0**	

PROJECT **NMIA Runway Extension - Palisadoes**

JOB NO. **200824**

DATE **18/9/08**

GRADATION CURVES

JETS

Kingston

Table 6 - II (u)