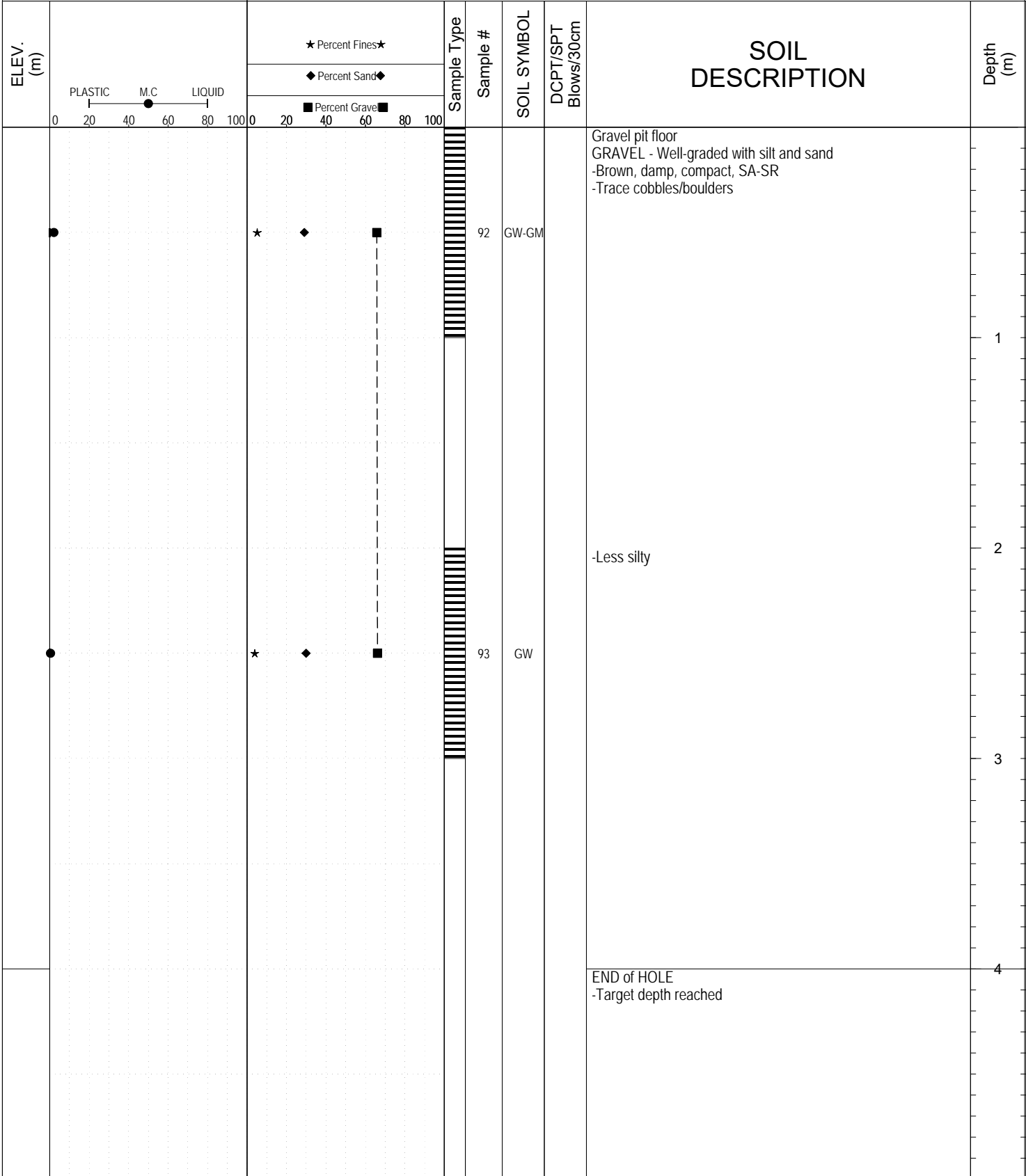


SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway	SOURCE/TP#: 900-5748
Graceland		Gravel exploration, 428.2 LHS	PROJECT NO: 552-202104
CAT 320CL		Coordinates: ZZ08N N6896389m E569685m	ELEVATION: m

SAMPLE TYPE UNDISTURBED DCPT AUGER BULK SPT CORE



Highways and Public Works
Transportation Engineering Branch

LOGGED BY: D.Lorenzi	Termination Depth: 4m
COMPILED BY: R.Stilwell	Complete: 10/5/2016 3:10:00 PM
REVIEWED BY:	Pit #: 105 K-03 Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway	SOURCE/TP#: 900-5749
Graceland		Gravel exploration, 428.2 LHS	PROJECT NO: 552-202104
CAT 320CL		Coordinates: ZZ08N N6896319m E569978m	ELEVATION: m

SAMPLE TYPE UNDISTURBED DCPT AUGER BULK SPT CORE

ELEV. (m)	PLASTIC M.C LIQUID 0 20 40 60 80 100			★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
							091	GW		ORGANICS - Roots, moss and silt -Dark brown, damp, very loose GRAVEL - Well-graded with sand -Brown, damp, loose	1
										END of HOLE -Refusal on rock	2
											3
											4

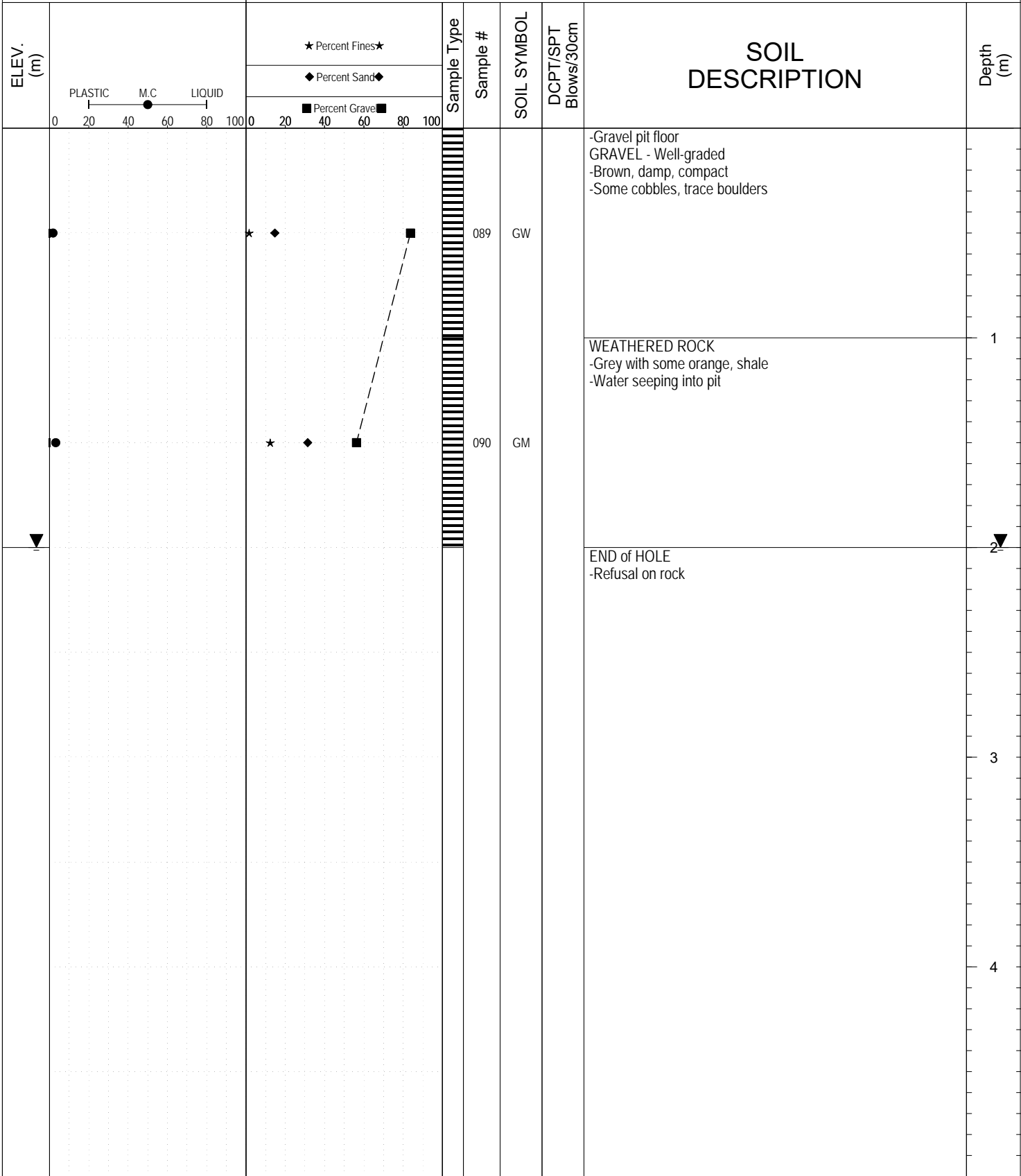


Highways and Public Works
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LOGGED BY: D.Lorenzi	Termination Depth: 1.5m
COMPILED BY: R.Stilwell	Complete: 10/5/2016 2:35:00 PM
REVIEWED BY:	Pit #: 105 K-03 Page 1 of 1


SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway	SOURCE/TP#: 900-5750
Graceland		Gravel exploration, 428.2 LHS	PROJECT NO: 552-202104
CAT 320CL		Coordinates: ZZ08N N6896340m E569702m	ELEVATION: m

SAMPLE TYPE UNDISTURBED DCPT AUGER BULK SPT CORE



Highways and Public Works
Transportation Engineering Branch

LOGGED BY: D.Lorenzi	Termination Depth: 2m
COMPILED BY: R.Stilwell	Complete: 10/5/2016 1:55:00 PM
REVIEWED BY:	Pit #: 105 K-03 Page 1 of 1

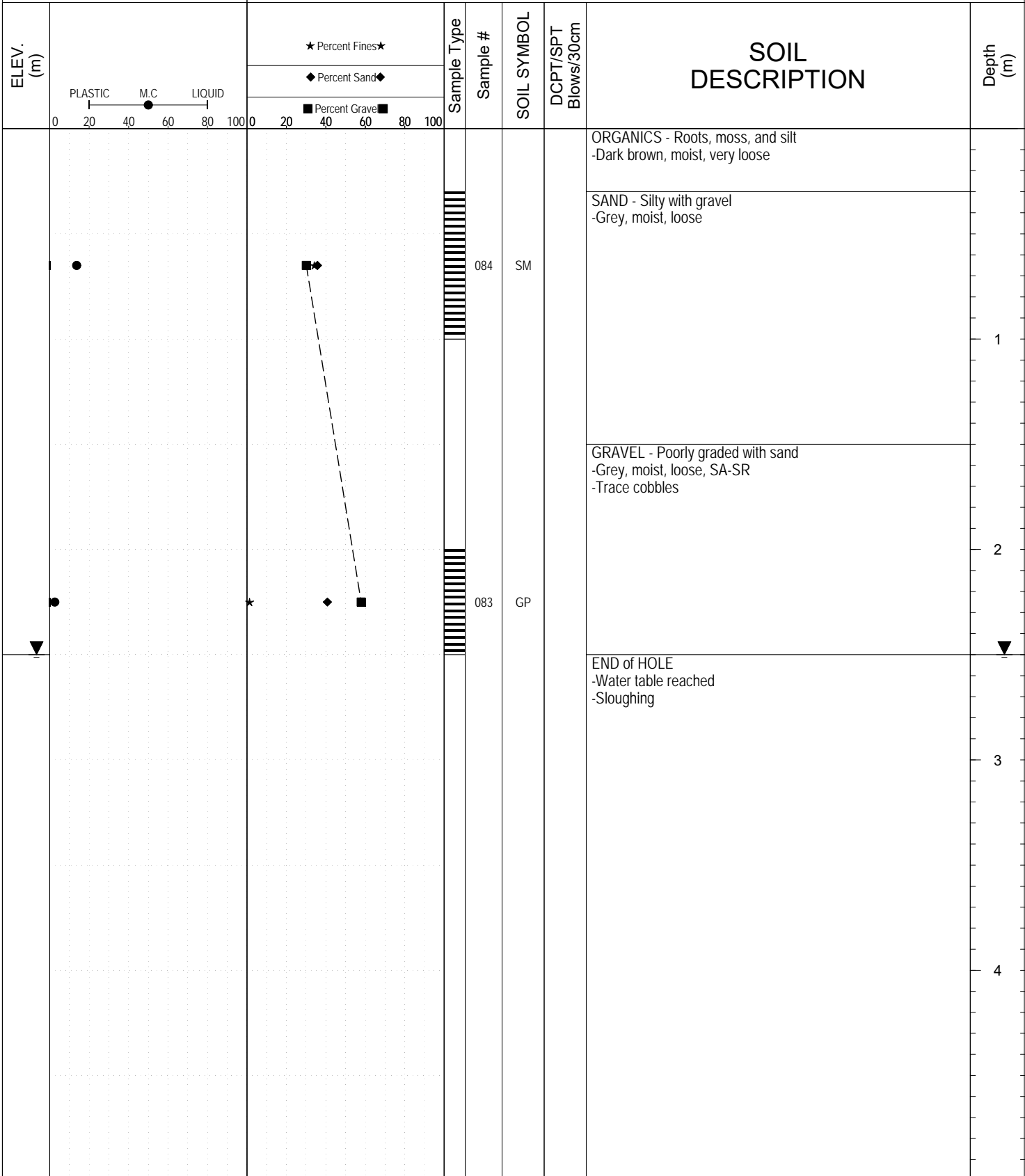
SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway		SOURCE/TP#: 900-5751					
Graceland		Gravel exploration, 428.2 LHS		PROJECT NO: 552-202104					
CAT 320CL		Coordinates: ZZ08N N6896351m E569502m		ELEVATION: m					
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED <input type="checkbox"/> DCPT <input type="checkbox"/> AUGER <input type="checkbox"/> BULK <input checked="" type="checkbox"/> SPT <input type="checkbox"/> CORE							
ELEV. (m)	PLASTIC M.C LIQUID 0 20 40 60 80 100	★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
		0 20 40 60 80 100							
				088	GW-GM			-Gravel pit floor GRAVEL - Well-graded with silt and sand -Brown/grey, damp, compact, SA-SR -Trace cobbles and boulders	1
								END of HOLE -Refusal on rock -Grey/orange shale, water seeping into hole	2
									3
									4
 Highways and Public Works Transportation Engineering Branch		LOGGED BY: D.Lorenzi		Termination Depth: 1.5m					
		COMPILED BY: R.Stilwell		Complete: 10/5/2016 1:35:00 PM					
		REVIEWED BY:		Pit #: 105 K-03		Page 1 of 1			

SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway		SOURCE/TP#: 900-5752				
Graceland		Gravel exploration, 428.2 LHS		PROJECT NO: 552-202104				
CAT 320CL		Coordinates: ZZ08N N6896343m E569310m		ELEVATION: m				
SAMPLE TYPE		<input type="checkbox"/> UNDISTURBED <input type="checkbox"/> DCPT <input type="checkbox"/> AUGER <input type="checkbox"/> BULK <input checked="" type="checkbox"/> SPT <input type="checkbox"/> CORE						
ELEV. (m)	★ Percent Fines ★ ◆ Percent Sand ◆ ■ Percent Gravel ■		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
	PLASTIC M.C LIQUID 0 20 40 60 80 100							
							ORGANICS - Roots, moss, and silt -Brown, damp, very loose	
							GRAVEL - Well-graded with silt and sand -Grey, damp, loose, SA-SR -Trace cobble/boulder ~300mm max diameter	
							-Some cobbles/boulders ~500mm max diameter	1
								2
								3
							END of HOLE -Water table reached	3
								4



SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway	SOURCE/TP#: 900-5753
Graceland		Gravel exploration, 428.2 LHS	PROJECT NO: 552-202104
CAT 320CL		Coordinates: ZZ08N N6896267m E569322m	ELEVATION: m

SAMPLE TYPE UNDISTURBED DCPT AUGER BULK SPT CORE



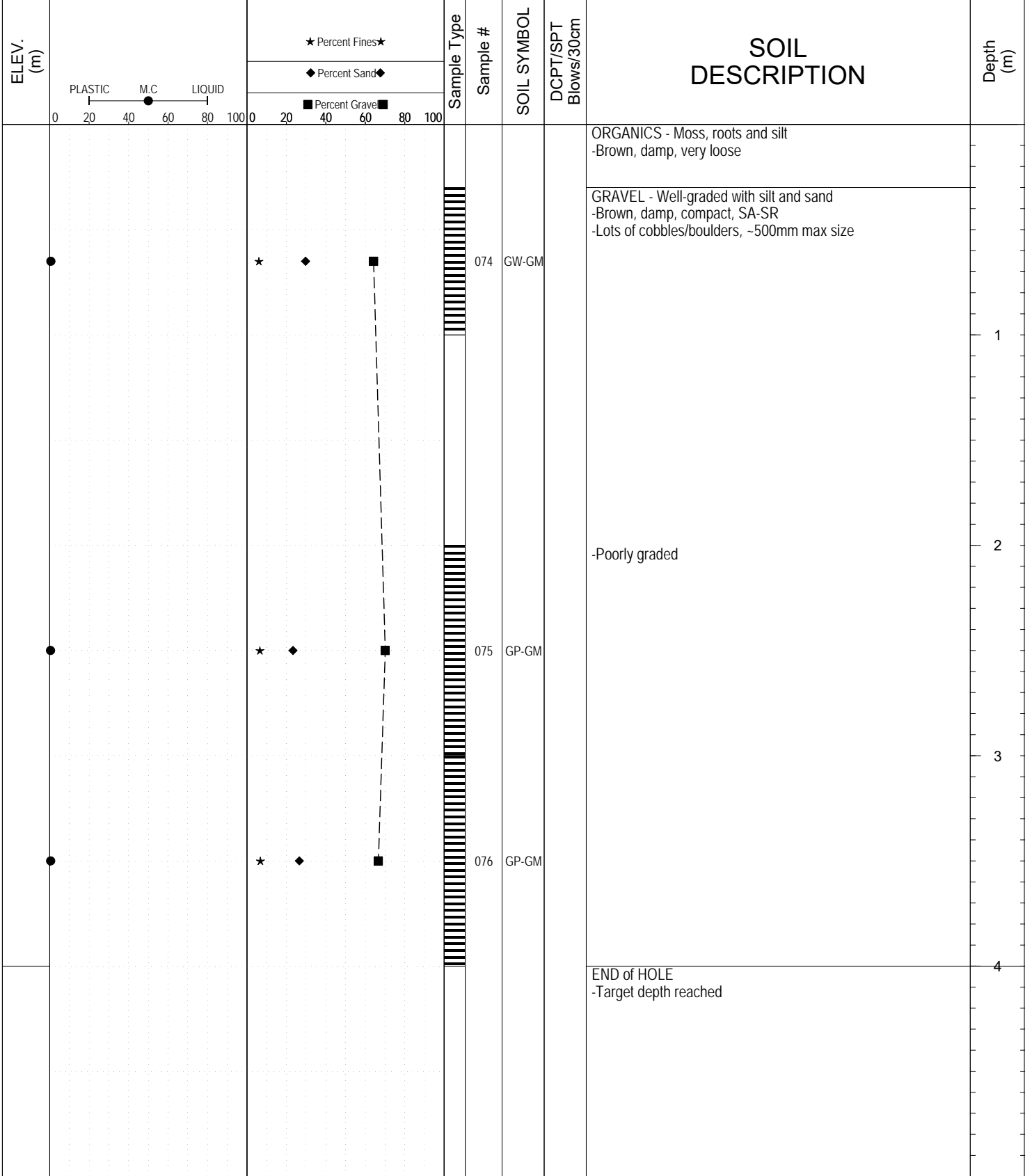
Highways and Public Works
Transportation Engineering Branch

LOGGED BY: D.Lorenzi	Termination Depth: 2.5m
COMPILED BY: R.Stilwell	Complete: 10/5/2016 12:20:00 PM
REVIEWED BY:	Pit #: 105 K-03 Page 1 of 1

SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway		SOURCE/TP#: 900-5754					
Graceland		Gravel exploration, 428.2 LHS		PROJECT NO: 552-202104					
CAT 320CL		Coordinates: ZZ08N N6896327m E569365m		ELEVATION: m					
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ELEV. (m)		★ Percent Fines★		Sample Type	Sample #	SOIL SYMBOL	DCPT/SPT Blows/30cm	SOIL DESCRIPTION	Depth (m)
		◆ Percent Sand◆							
		0 20 40 60 80 100		0 20 40 60 80 100					
		●		★ ◆ ■					
		●		★ ◆ ■		080	GW-GM	ORGANICS - Roots, moss, leaves -Brown, damp, very loose GRAVEL - Well-graded with silt and sand -Brown, damp, compact, SA-SR -Some cobbles/boulders, ~500mm max size -Silty	1
		●		★ ◆ ■		081	GM	-Poorly graded with silt and sand	2
		●		★ ◆ ■		082	GP-GM		3
								END of HOLE -Target depth reached	4
		Highways and Public Works Transportation Engineering Branch				LOGGED BY: D.Lorenzi		Termination Depth: 4m	
						COMPILED BY: R.Stilwell		Complete: 10/5/2016 11:35:00 AM	
						REVIEWED BY:		Pit #: 105 K-03 Page 1 of 1	

SUBSURFACE EXPLORATION AND TEST REPORT		Campbell Highway	SOURCE/TP#: 900-5756
Graceland		Gravel exploration, 428.2 LHS	PROJECT NO: 552-202104
CAT 320CL		Coordinates: ZZ08N N6896317m E569469m	ELEVATION: m

SAMPLE TYPE UNDISTURBED DCPT AUGER BULK SPT CORE



Highways and Public Works
Transportation Engineering Branch

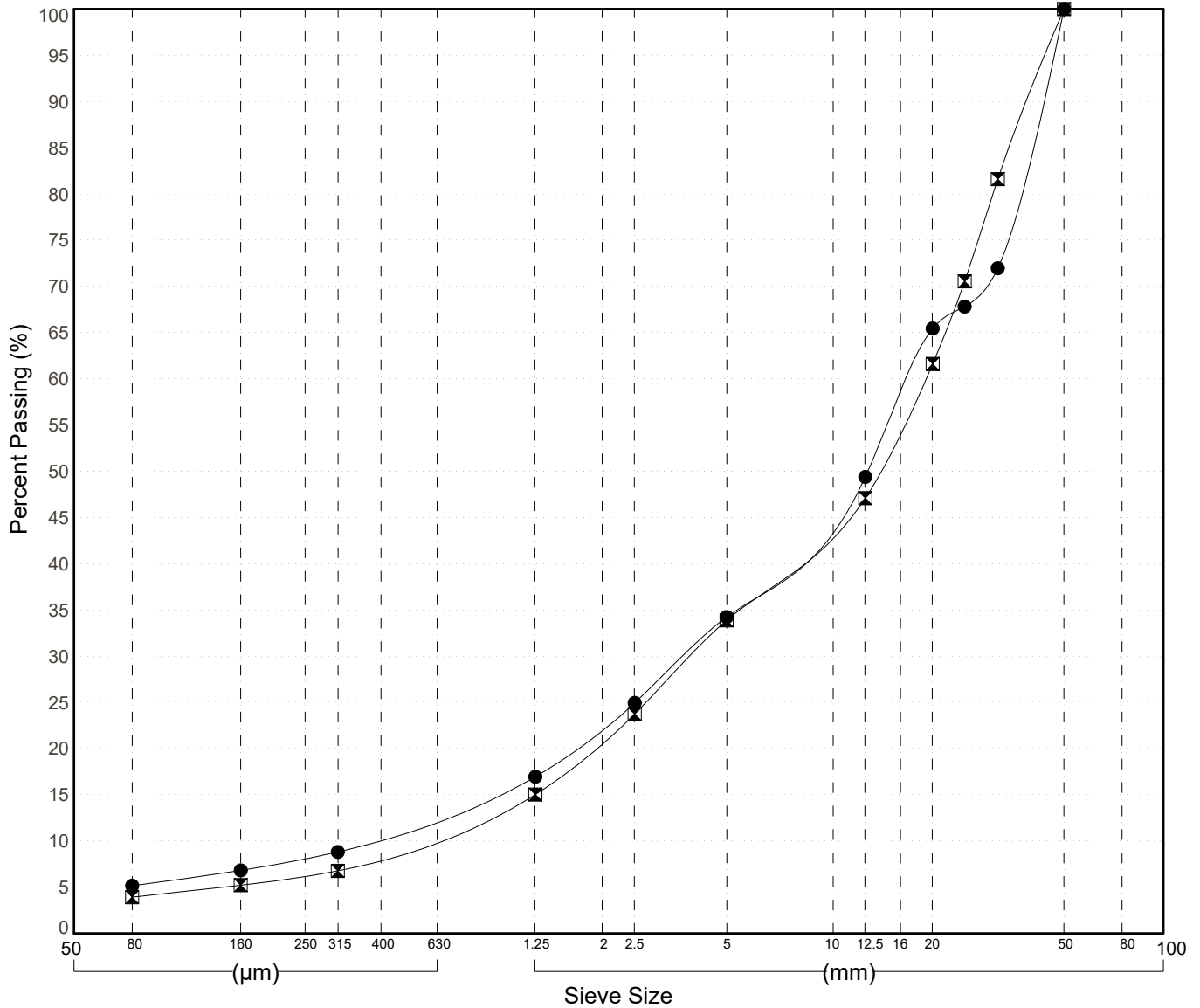
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COMPILED BY: R.Stilwell	Complete: 10/5/2016 9:45:00 AM
REVIEWED BY:	Pit #: 105 K-03 Page 1 of 1

GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5748
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896389m E569685m	ELEVATION: m

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Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10									
● 92	682	0.0 to 1.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	2.1	NP	NP	NP	1.9	44.3	0.39									
☒ 93	683	2.0 to 3.0	WELL-GRADED GRAVEL with SAND(GW)	0.4	NP	NP	NP	1.3	35.1	0.54									
Field #	Lab #	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	% Breakdown			
● 92	682	100.0	100.0	100.0	67.8	65.4	49.4	45.9	34.2	24.9	16.9	12.9	8.8	6.8	5.2	Gravel	Sand	Silt	Clay
☒ 93	683	100.0	100.0	100.0	70.5	61.6	47.1	44.0	33.9	23.7	15.0	10.9	6.8	5.2	3.9	66.1	29.9		3.9

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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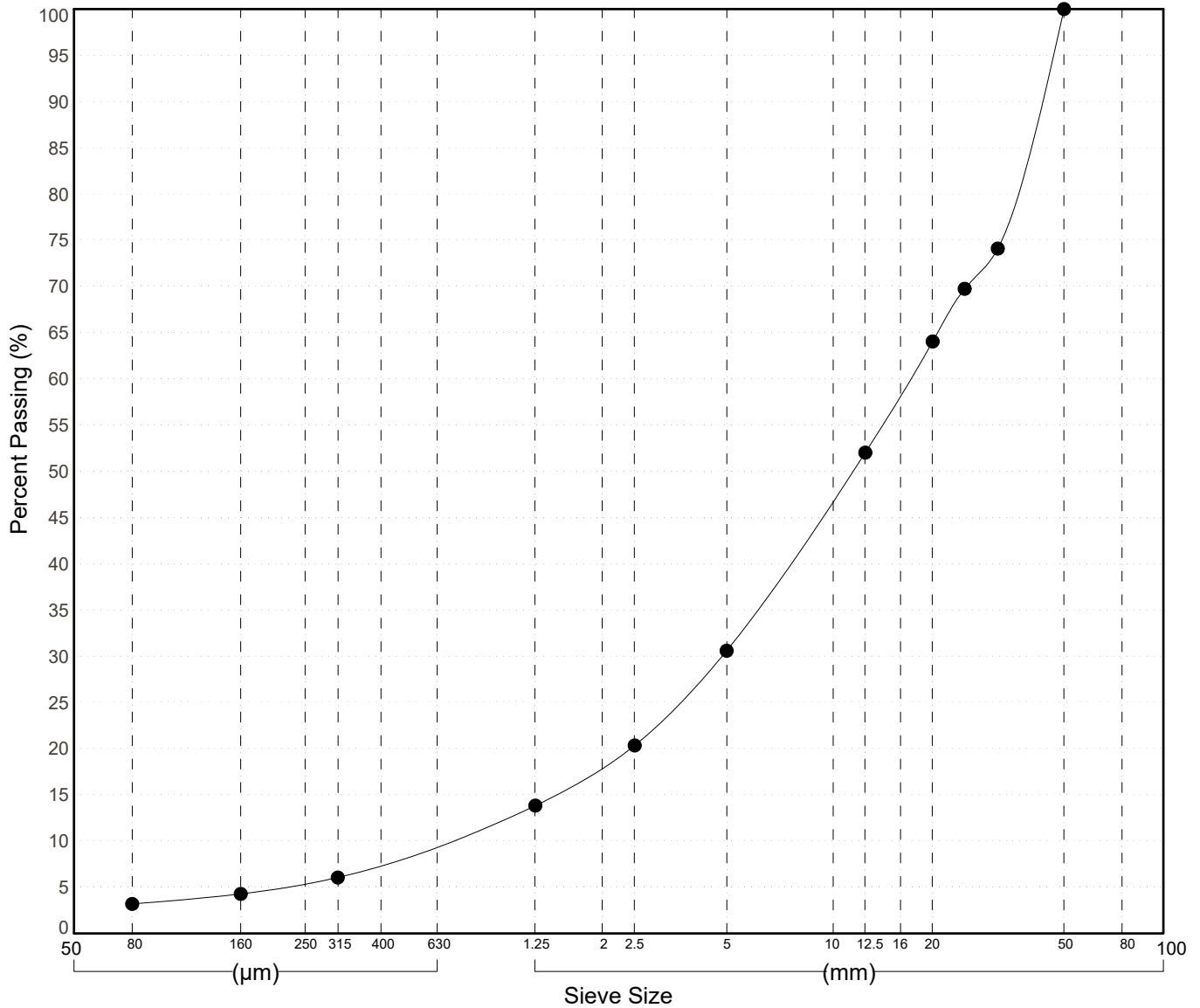
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GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5749
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896319m E569978m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10									
● 091	681	0.2 to 0.8	WELL-GRADED GRAVEL with SAND(GW)	2.2	NP	NP	NP	1.9	26.9	0.63									
Field #	Lab #	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	% Breakdown			
● 091	681	100.0	100.0	100.0	69.7	64.0	52.0	47.1	30.6	20.3	13.8	10.0	6.0	4.3	3.2	Gravel	Sand	Silt	Clay
																69.4	27.4		3.2

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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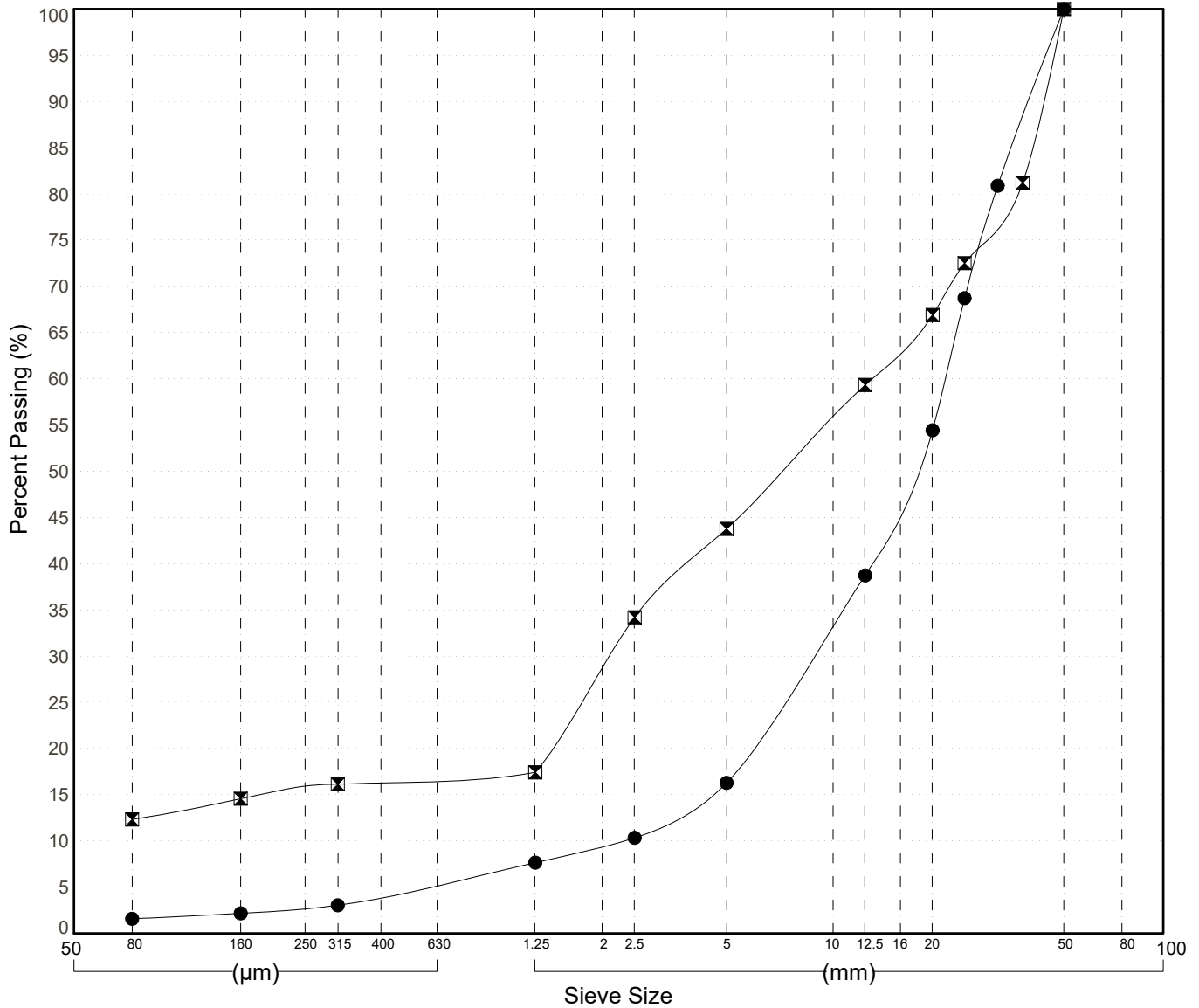
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GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5750
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896340m E569702m	ELEVATION: m

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Field #	Lab #	Depth	Classification													%H2O	LL	PL	PI	Cc	Cu	D10
● 089	679	0.0 to 1.0	WELL-GRADED GRAVEL(GW)													1.8	NP	NP	NP	1.5	9.5	2.29
☒ 090	680	1.0 to 2.0	SILTY GRAVEL with SAND(GM)													3.2	NP	NP	NP	9.9	381.0	
Field #	Lab #	%PASSING	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	% Breakdown					
● 089	679	100.0	100.0	100.0	100.0	68.7	54.4	38.7	33.6	16.3	10.3	7.7	5.4	3.0	2.2	1.6	Gravel	Sand	Silt	Clay		
☒ 090	680	100.0	100.0	100.0	72.5	66.9	59.3	55.7	43.8	34.2	17.4	16.8	16.1	14.6	12.3		56.2	31.4		12.3		

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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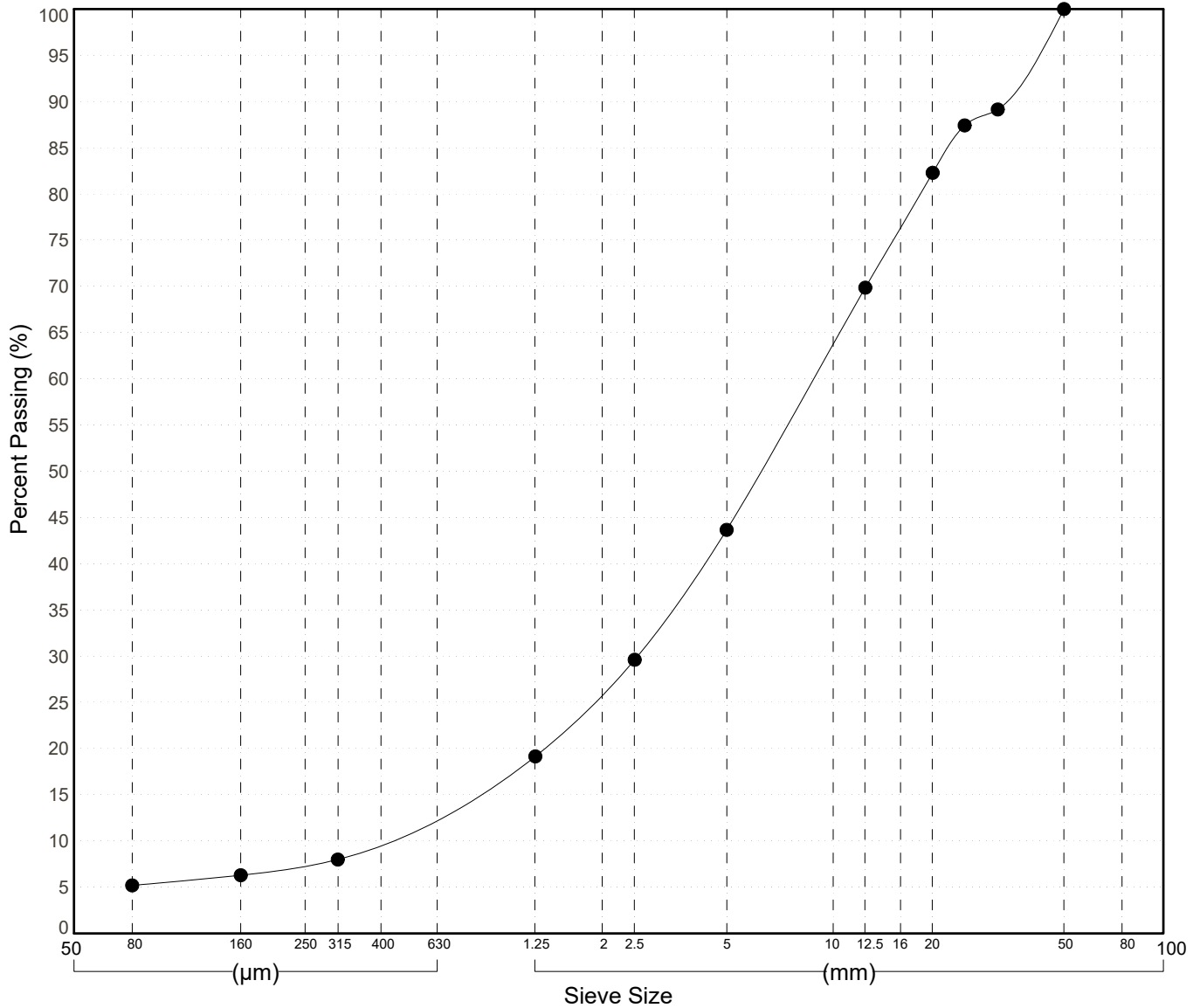
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GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5751
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896351m E569502m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H ₂ O	LL	PL	PI	C _c	C _u	D ₁₀									
● 088	678	0.0 to 1.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	4.5	NP	NP	NP	1.8	21.5	0.40									
Field #	Lab #	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	% Breakdown			
● 088	678	100.0	100.0	100.0	87.4	82.3	69.9	63.8	43.7	29.6	19.2	13.6	8.0	6.3	5.2	Gravel	Sand	Silt	Clay
																56.3	38.5		5.2

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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Pit #: 105 K-03
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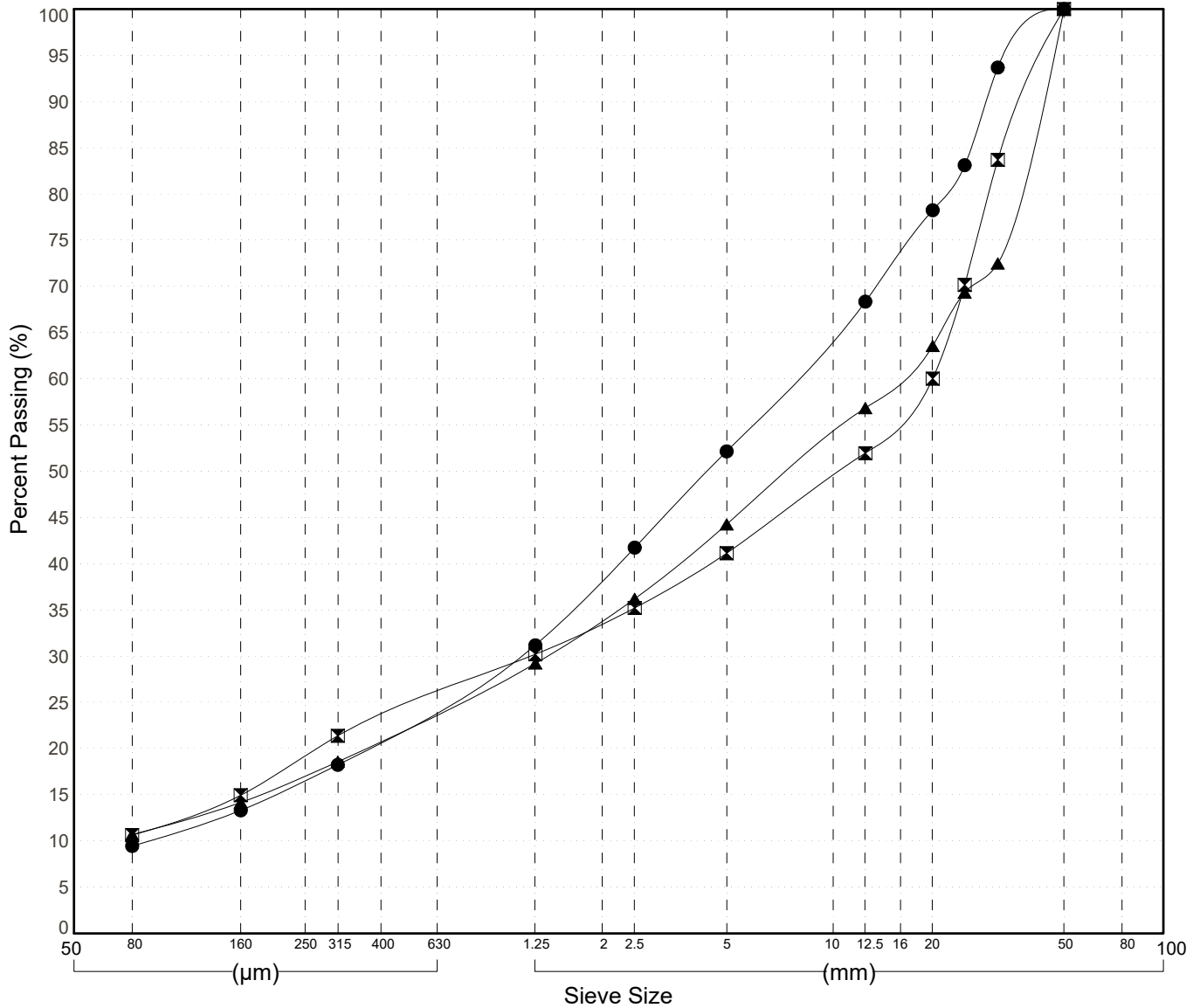
GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5752
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896343m E569310m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 085	675	0.3 to 1.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	2.3	NP	NP	NP	1.9	91.0	0.08
☒ 086	676	1.0 to 2.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	2.5	NP	NP	NP	1.1	298.0	
▲ 087	677	2.0 to 3.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	4.9	NP	NP	NP	1.8	242.2	

Field #	Lab #	% PASSING														% Breakdown			
		100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	Gravel	Sand	Silt	Clay
● 085	675	100.0	100.0	100.0	83.1	78.2	68.3	64.6	52.1	41.7	31.2	24.7	18.2	13.3	9.5	47.9	42.7		9.5
☒ 086	676	100.0	100.0	100.0	70.2	60.0	52.0	49.5	41.1	35.2	30.2	25.8	21.4	15.0	10.6	58.9	30.5		10.6
▲ 087	677	100.0	100.0	100.0	69.3	63.6	56.8	53.9	44.3	36.2	29.2	23.9	18.6	14.2	10.7	55.7	33.6		10.7

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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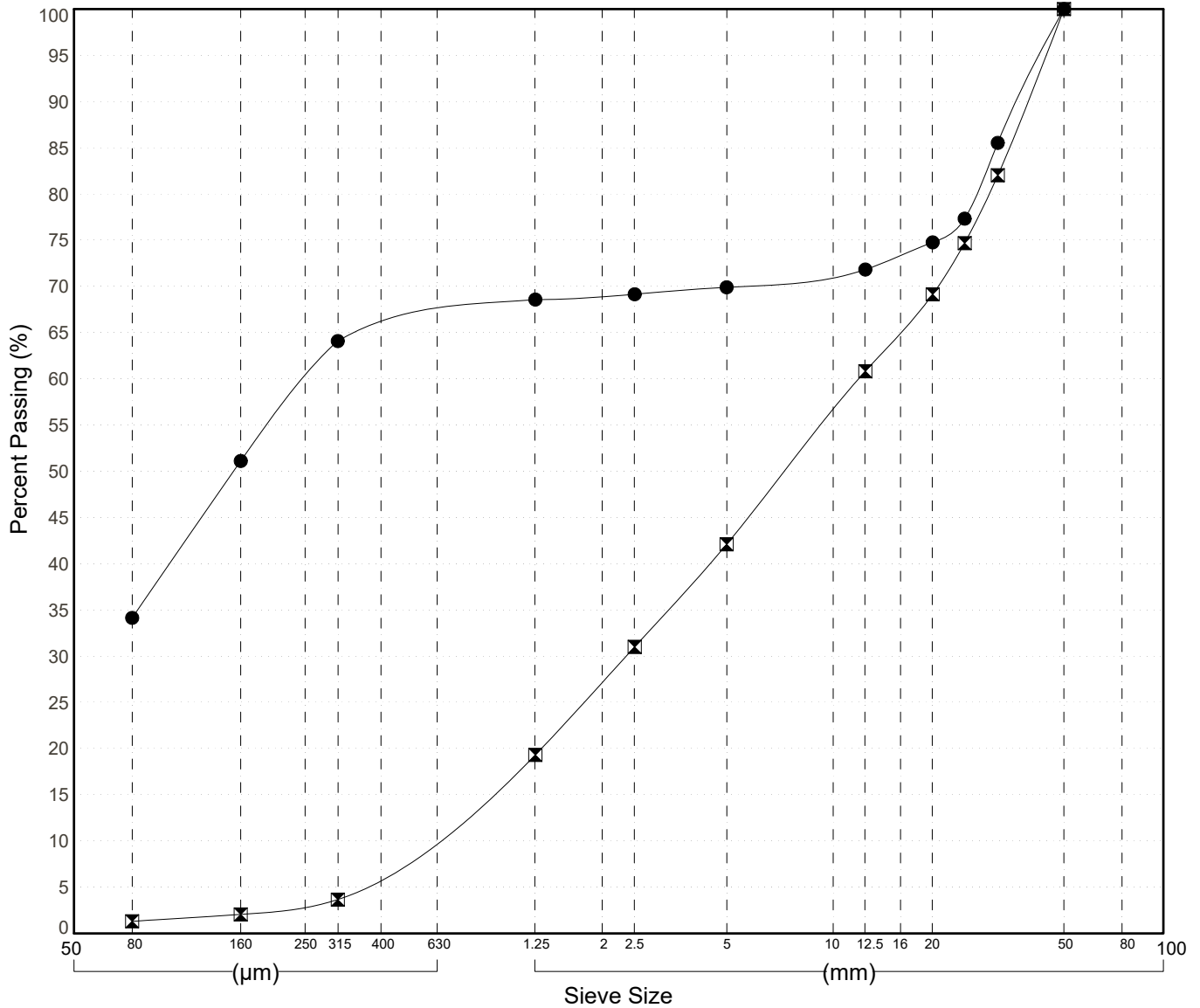
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GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5753
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896267m E569322m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification											%H2O	LL	PL	PI	C c	Cu	D 10
● 084	674	0.3 to 2.5	SILTY SAND with GRAVEL(SM)											13.7	NP	NP	NP			
☒ 083	673	2.0 to 1.0	POORLY GRADED GRAVEL with SAND(GP)											2.6	NP	NP	NP	0.8	21.8	0.55
Field #	Lab #	%PASSING	100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	% Breakdown			
			Gravel	Sand	Silt	Clay														
● 084	674	100.0	100.0	100.0	77.3	74.8	71.8	71.4	69.9	69.1	68.6	66.3	64.1	51.1	34.1	30.1	35.8	34.1		
☒ 083	673	100.0	100.0	100.0	74.7	69.1	60.8	56.5	42.1	31.0	19.3	11.5	3.7	2.1	1.3	57.9	40.8	1.3		

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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Pit #: 105 K-03
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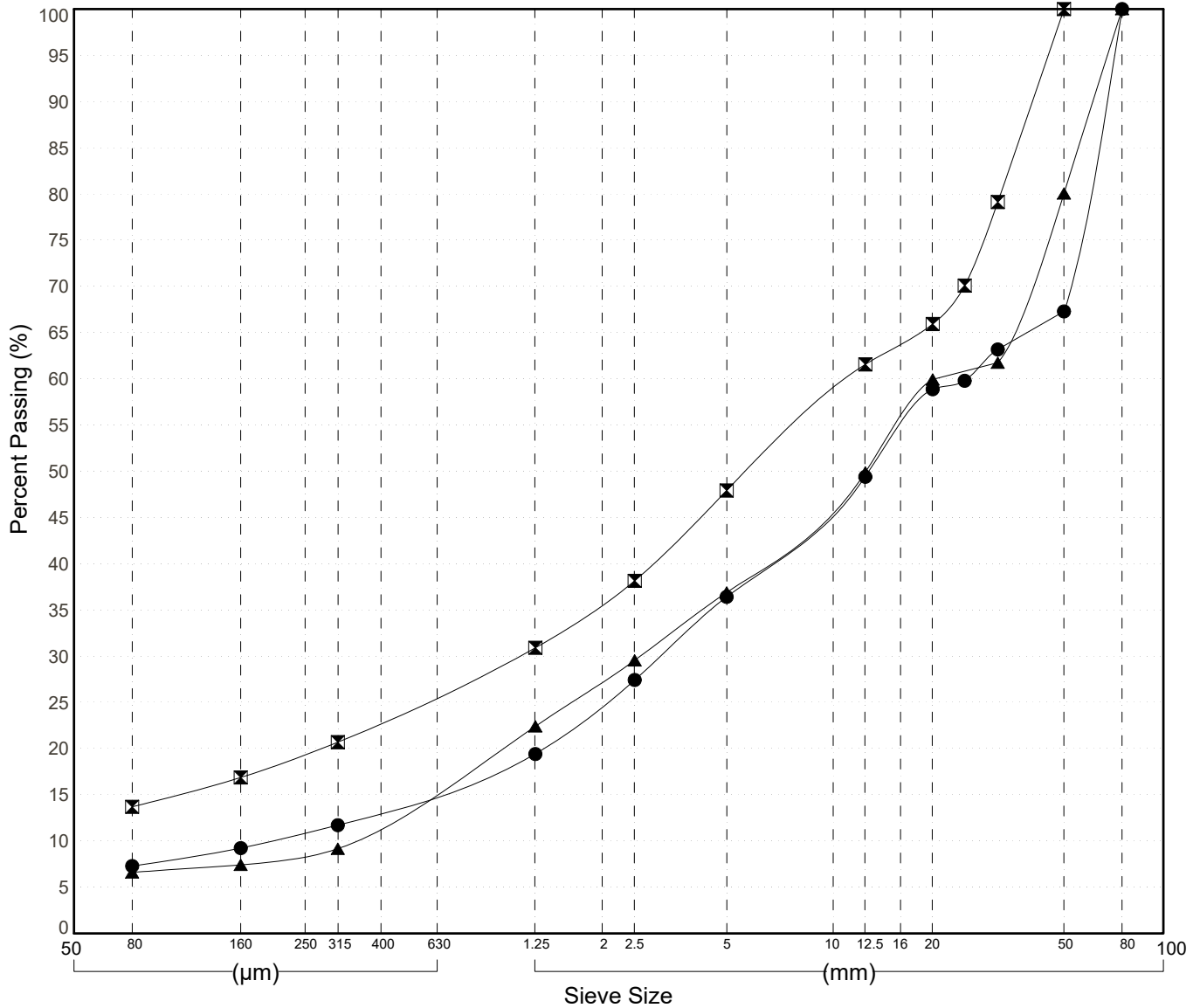
GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5754
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896327m E569365m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 080	670	0.3 to 1.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	4.8	NP	NP	NP	1.8	128.5	0.20
☒ 081	671	2.0 to 3.0	SILTY GRAVEL with SAND(GM)	5.6	NP	NP	NP			
▲ 082	672	3.0 to 4.0	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	3.0	NP	NP	NP	1.0	59.2	0.34

Field #	Lab #	% PASSING														% Breakdown			
			100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	Gravel	Sand	Clay
●	080	670	100.0	100.0	67.3	59.8	58.9	49.4	46.4	36.4	27.4	19.4	15.6	11.7	9.2	7.3	63.6	29.1	7.3
☒	081	671	100.0	100.0	100.0	70.1	65.9	61.6	58.4	47.9	38.1	30.9	25.8	20.7	16.9	13.7	52.1	34.2	13.7
▲	082	672	100.0	100.0	80.1	60.8	59.9	49.9	46.9	36.9	29.5	22.4	15.8	9.2	7.4	6.6	63.1	30.3	6.6

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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Pit #: 105 K-03
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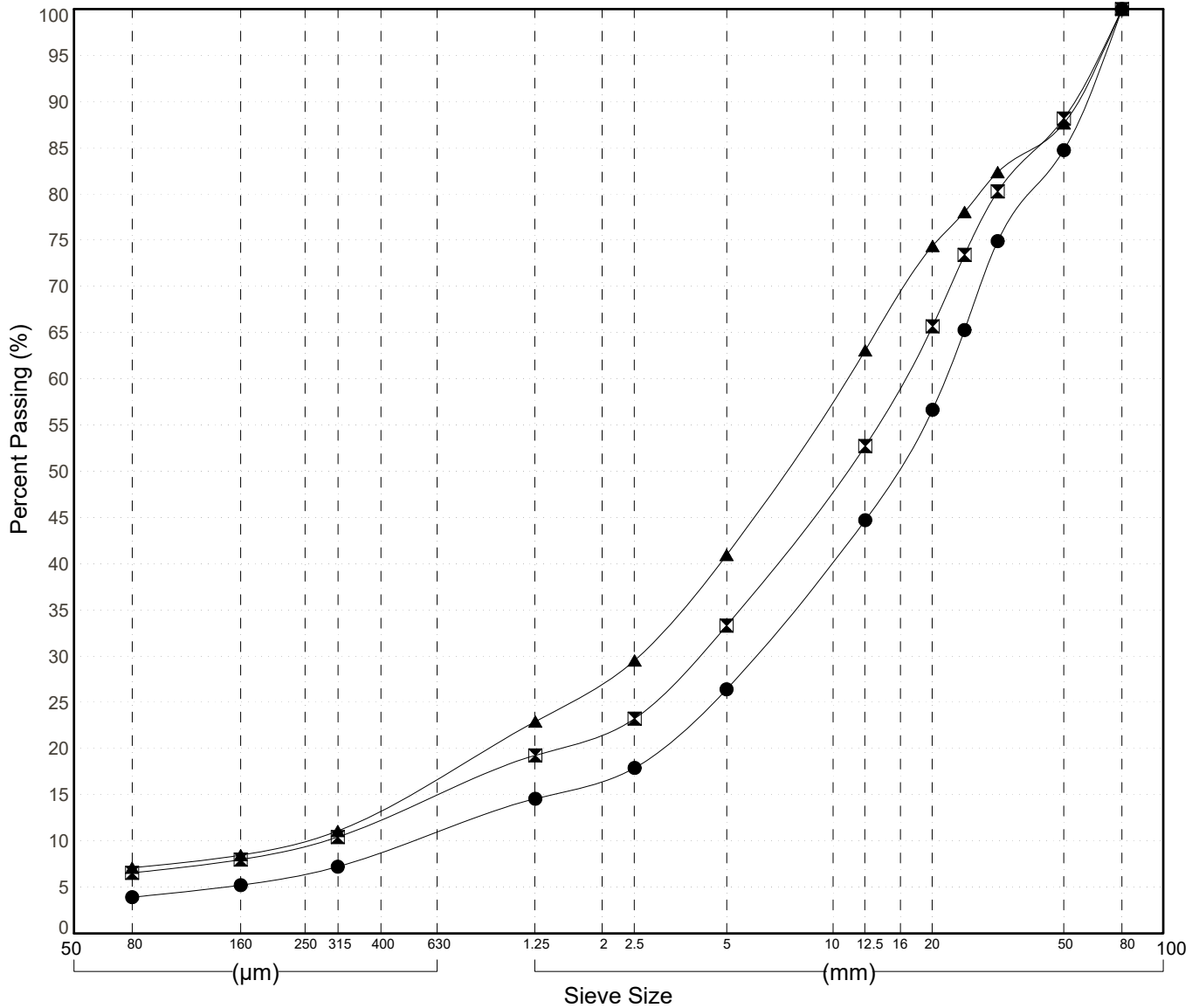
GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5755
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896326m E569414m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 077	667	0.3 to 1.0	WELL-GRADED GRAVEL with SAND(GW)	0.7	NP	NP	NP	2.8	41.1	0.53
☒ 078	668	2.0 to 3.0	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	2.6	NP	NP	NP	3.2	58.1	0.28
▲ 079	669	3.0 to 4.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	1.9	NP	NP	NP	2.5	45.9	0.24

Field #	Lab #	% PASSING														% Breakdown				
			100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	Gravel	Sand	Silt	Clay
●	077	667	100.0	100.0	84.7	65.3	56.6	44.7	40.5	26.4	17.9	14.6	10.9	7.2	5.2	3.9	73.6	22.5		3.9
☒	078	668	100.0	100.0	88.2	73.4	65.7	52.7	48.2	33.3	23.2	19.3	14.9	10.4	8.0	6.6	66.7	26.7		6.6
▲	079	669	100.0	100.0	87.6	78.0	74.4	63.1	58.0	40.9	29.5	22.9	17.0	11.1	8.5	7.1	59.1	33.8		7.1

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

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REVIEWED BY:

Pit #: 105 K-03
Complete: 10/5/2016 10:40:00 AM

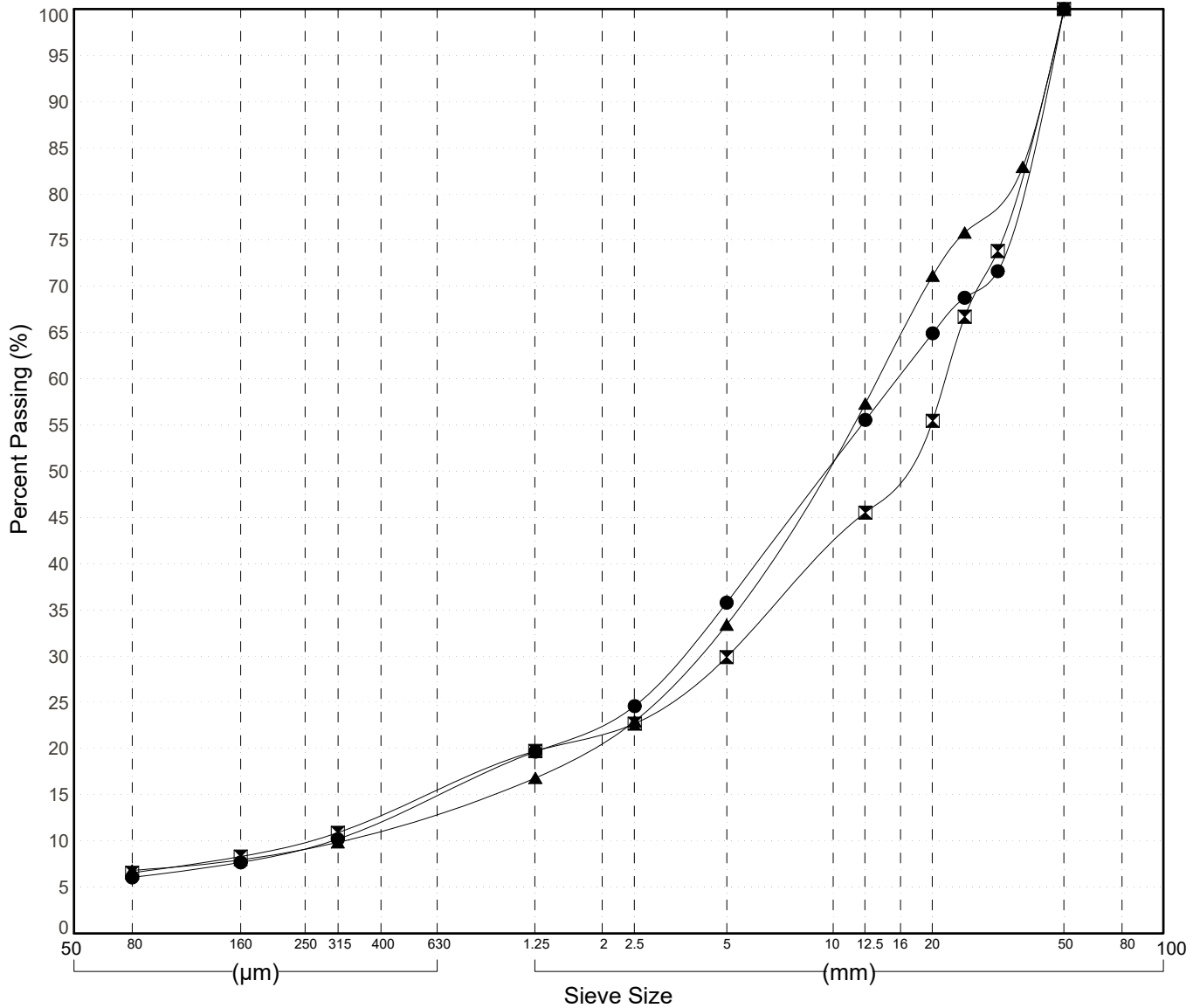
GRAIN SIZE ANALYSIS	Gravel exploration	SOURCE/TP#: 900-5756
Graceland	428.2 LHS	PROJECT NO: 552-202104
CAT 320CL	Coordinates:ZZ08N N6896317m E569469m	ELEVATION: m

Master Revised June 2017

Field #	Lab #	Depth	Classification	%H2O	LL	PL	PI	Cc	Cu	D10
● 074	664	0.3 to 1.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	0.6	NP	NP	NP	2.5	52.2	0.30
☒ 075	665	2.0 to 3.0	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	0.4	NP	NP	NP	4.2	87.8	0.25
▲ 076	666	3.0 to 4.0	POORLY GRADED GRAVEL with SILT and SAND(GP-GM)	0.5	NP	NP	NP	3.3	42.2	0.32

Field #	Lab #	% PASSING	Sieve Size (mm)													% Breakdown				
			100.0	80.0	50.0	25.0	20.0	12.5	10.0	5.0	2.5	1.25	0.630	0.315	0.160	0.080	Gravel	Sand	Silt	Clay
●	074	664	100.0	100.0	100.0	68.8	64.9	55.6	51.0	35.8	24.6	19.7	15.0	10.2	7.7	6.1	64.2	29.7	6.1	
☒	075	665	100.0	100.0	100.0	66.7	55.5	45.5	41.9	29.9	22.7	19.7	15.3	10.9	8.3	6.6	70.1	23.3	6.6	
▲	076	666	100.0	100.0	100.0	75.8	71.2	57.3	51.8	33.4	22.9	16.8	13.4	9.9	7.9	6.8	66.6	26.6	6.8	

Silt	Sand			Gravel	
	Fine	Medium	Coarse	Fine	Coarse



Highways and Public Works
Transportation Engineering Branch

LOGGED BY: D.Lorenzi
COMPILED BY: R.Stilwell
REVIEWED BY:

Pit #: 105 K-03
Complete: 10/5/2016 9:45:00 AM