Delaware Department of Transportation

Additional Boring Information

Contract Number: **T201707105**
BR 1-065 on Parkside Boulevard over Perkins Run

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Boring PB-1

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task 143 **BORING LOG** CME75 Trailer

NAME: BR 1-065 on Parkside Blvd. over Perkins Run PROJECT NO. T201707105

SUPERVISOR

BORING NO. PB-1	DRILLER Jason - Dave	DATE: 10/3/17
WEATHER Sunny	SURFACE ELEVATION Logger - R. Ferguson	DATUM:

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
					3" Hot mix and 8" Stone base					
1	1.0	2.0			moist brown silty f-c sand + gravel	12	—	—	—	—
2	2.0	4.0			moist brown stiff silty clay trace sand	20	8	6	7	7
3	4.0	6.0			moist brown very stiff silty clay trace sand	18	5	6	9	12
4	6.0	8.0			moist brown hard silty clay trace sand	17	11	16	14	13
5	8.0	10.0			moist brown stiff silty clay trace sand	15	6	5	8	7
6	10.0	12.0			moist brown very stiff silty clay trace sand	13	5	9	9	9
U-1	12.0	14.0			Shelby tube press sample.	20	P	U	S	H
8	14.0	16.0			wet brown dense clayey decomposed rock	12	15	21	25	29
9	16.0	18.0			sat. brown very dense clayey decomposed rock	6	50/5			
10	18.0	20.0			sat. brown dense clayey decomposed rock	15	5	19	21	15
11	24.0	24.5			sat. brown very dense clayey decomposed rock	3	50/3			
RUN 1	24.9	29.9			Rock - granite. Recovery = 97% RQD = 93%					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: Sample 1 = auger cuttings. Auger refusal @ 24'9."

GROUNDWATER

Water through augers @	17'6"
@ completion	16'3"

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
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54-55
55-56
56-57
57-58
58-59
59-60

241.9

9 16.0 18.0
10 18.0 20.0
11 20.0 24.5
RUN 1 24.9 29.9
Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive in casing 12 inches.
REMARKS: Sample 1 = auger cuttings. Auger refusal @ 24.9".
GROUNDWATER
19'6"
11'3"
T201707105 - PB-1
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Depth
Rec
RQD
R-1 24.9-29.9
58"
93%
PB-1 T201707105

T201707105 - PB-1
Page 7 of 63

REPORT OF UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMEN

CLIENT: Walton Corporation

PROJECT NAME: Task 143, T201707105- BR 1-065 on Parkside Boulevard over Perkins Run

ETS Job NO.: ETS-17T303

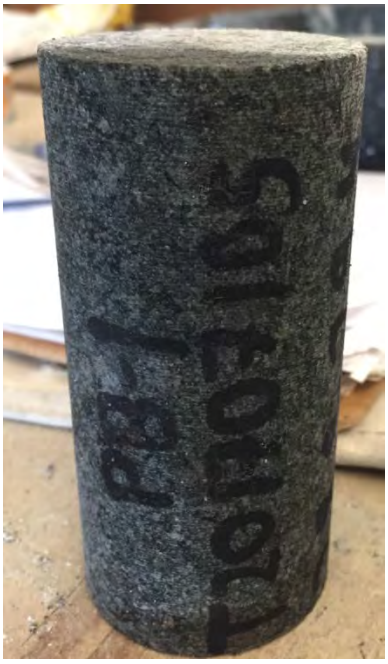
MATERIAL DESCRIPTION: Grey and White, Granite

LOAD DIRECTION: Uniaxial

This Specimen was not prepared in accordance with ASTM D4543

Engineer: Raju Acharya, PhD, PE

COMPRESSION TEST RESULTS (ASTM D7012) - Method "C"											
LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	DEPTH (FT.)	DATE OF TEST	SPECIMEN DIAMETER (IN.)	SPECIMEN HEIGHT (IN.)	SPECIMEN AREA (SQ. IN.)	TOTAL LOAD (LBS.)	COMPRESSIVE STRENGTH (PSI)	AMBIENT TEMPERATURE AT TEST (F°)	BREAK TYPE	TIME TO FAILURE (MIN.)
Task 143	PB-1	28.9-29.4	12/18/2017	2.0	4.0	3.1416	52,570	16,730	70	3	2.0



Respectfully Submitted,
Charlie T. Nabhan, PE
Principal Geotechnical Engineer

Respectfully Submitted,
Raju Acharya, PhD, PE
Geotechnical Engineer

5226 Indian River Road • Suite 103 • Virginia Beach, VA 23464 • *phone 757.306.1040* • *fax 757.306.1042*
www.etsva.com

Boring PB-2

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task 1&3 **BORING LOG** CME55 Truck

NAME: BR 1-065 on Parkside Blvd. over Perkins Run PROJECT NO. T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
PB-2	Billy, Hector, Lillian	10/3/17
WEATHER	SURFACE ELEVATION	DATUM:
Sunny	Logger - R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
					4" Hot mix and 4" Stone base					
1	0.5	2.0			moist brown silty f-c sand trace gravel	18	—	—	—	—
2	2.0	4.0			moist brown stiff silty clay trace sand	5	11	6	7	8
3	4.0	6.0			large gravel in tip of spoon	1	9	8	9	9
4	6.0	8.0			no sample recovery.	0	4	5	6	5
5	8.0	10.0			moist brown firm silty clay trace sand + gravel	4	4	4	5	4
6	10.0	12.0			moist brown firm silty clay trace sand	14	4	4	3	5
7	12.0	14.0			moist brown firm silty clay trace sand	9	3	3	4	5
8	14.0	16.0			wet brown loose clayey decomposed rock	12	3	5	5	5
9	16.0	18.0			wet brown med. dense clayey decomposed rock	16	7	9	8	8
10	18.0	19.0			sat. grey hard silty clay w/decomposed rock	4	3	3	4	50
RUN 1	19.0	24.0			Rock-granite, Recovery = 55%, RQD = 0.					
RUN 2	24.0	29.0			Rock-granite, Recovery = 93%, RQD = 82%					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: Sample 1 = auger cuttings. Refusal @ 19'.

GROUNDWATER

Water through augers @	18'
@ completion,	DRY

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
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52-53
53-54
54-55
55-56
56-57
57-58
58-59
59-60
60-61

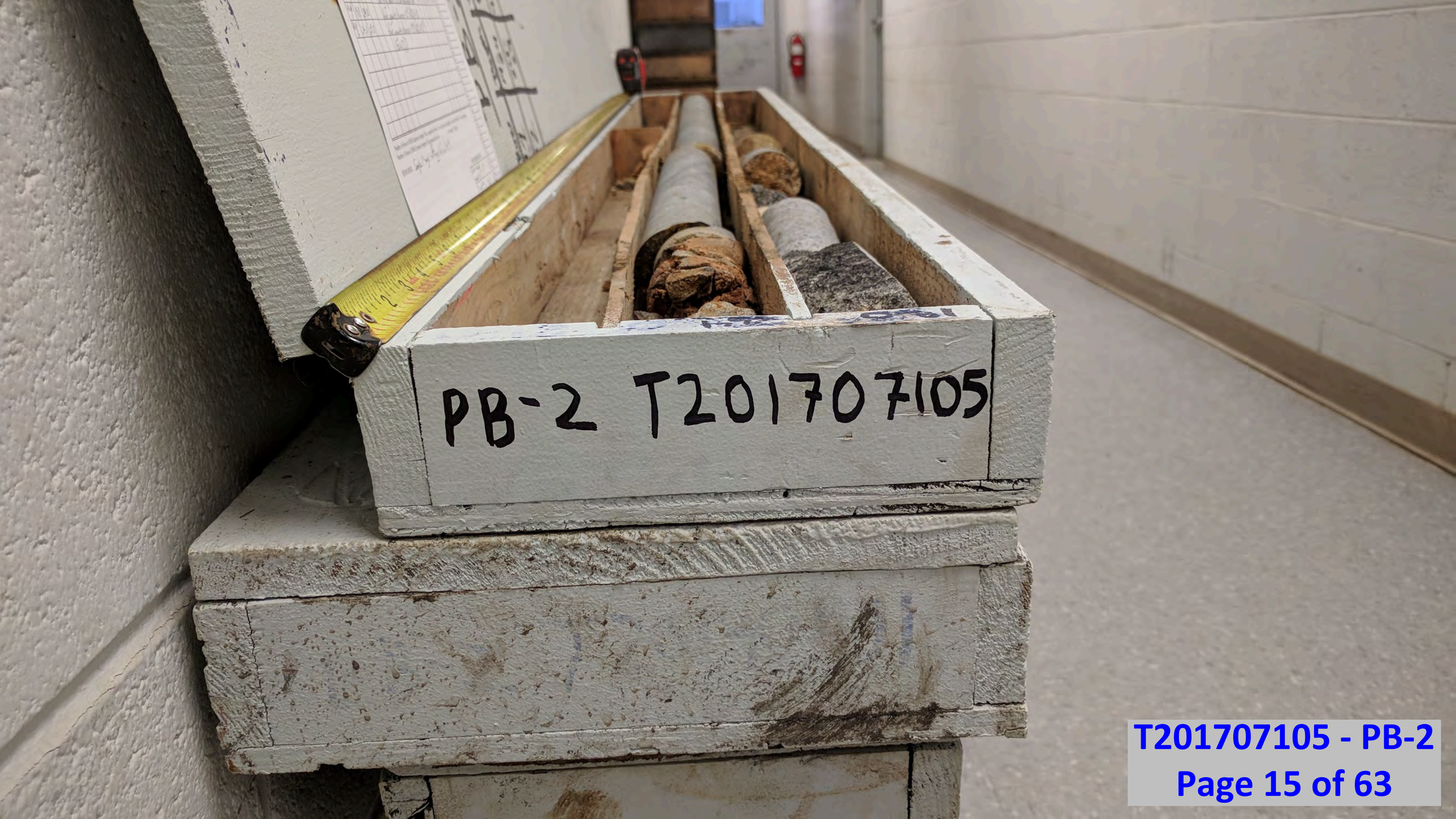
PB-2
Depth
19-24
24-29
Run
#1
#2
GROUNDWATER
18'
DRY
REMARKS: Sample 1 = auger cuttings. Refusal @ 19'.
(END)

T201707105 - PB-2
Page 12 of 63

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61
62
DTC-1 T201870301
SS-2 T201407003
SS-1 T201407003

PB-2

RUN	Depth	Rec	RQD
#1	19-24	55%	0%
#2	24-29	93%	~~83~~% 82%


PB-2 T201707105

WALTON CORPORATION
DRILLING CONTRACTOR
P.O. BOX 1097, NEWARK, DELAWARE 19715
PB-2
Run | Depth | Rec | RQD
1 | 19-24 | 55% | 0%
2 | 24-29 | 93% | 83%

REPORT OF UNIAXIAL COMPRESSIVE STRENGTH OF INTACT ROCK CORE SPECIMEN

CLIENT: Walton Corporation

PROJECT NAME: Task 143, T201707105- BR 1-065 on Parkside Boulevard over Perkins Run

ETS Job NO.: ETS-17T303

MATERIAL DESCRIPTION: Grey and White, Granite

LOAD DIRECTION: Uniaxial

This Specimen was not prepared in accordance with ASTM D4543

Engineer: Raju Acharya, PhD, PE

COMPRESSION TEST RESULTS (ASTM D7012) - Method "C"											
LABORATORY NUMBER	SPECIMEN IDENTIFICATION OR SET NO.	DEPTH (FT.)	DATE OF TEST	SPECIMEN DIAMETER (IN.)	SPECIMEN HEIGHT (IN.)	SPECIMEN AREA (SQ. IN.)	TOTAL LOAD (LBS.)	COMPRESSIVE STRENGTH (PSI)	AMBIENT TEMPERATURE AT TEST (F°)	BREAK TYPE	TIME TO FAILURE (MIN.)
Task 143	PB-2	26.5-27.0	12/18/2017	2.0	4.0	3.1416	124,580	39,650	70	3	3.0

Respectfully Submitted,
Charlie T. Nabhan, PE
Principal Geotechnical Engineer

Respectfully Submitted,
Raju Acharya, PhD, PE
Geotechnical Engineer

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Boring PB-3A

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task2-QP18 **BORING LOG** CME55 Truck

NAME: BRI-065 on Parkside Blvd over Perkins Run **PROJECT NO.** T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
PB-3A	Billy, Lillian	7/16/18
WEATHER	**SURFACE ELEVATION**	**DATUM:**
Sunny	Logger-R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
	0.0	16.5			Blank auger					
RUN 1	16.5	21.5			Rock-Wissahickon schist. Recovery=59"=98%; RQD=87%					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS: PB-3 drilled to 17' and cored 5' rock and could not break rock core and offset 5' and drilled PB-3A.

GROUNDWATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
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45-46
46-47
47-48
48-49
49-50
50-51
51-52
52-53
53-54
54-55
55-56
56-57
57-58

REMARKS PB-3 drilled to 17' and cored 5' rock and could not break rock core and offset 5' and drilled PB-3A.
GROUNDWATER
22'
31.0'

GROUNDWATER

Run	Depth	RQD	REC
#1	~~17-22~~ 16.5-21.5	~~[illegible]~~ 87%	98%

PB-3A T201707105
T2 DATA

T 201707105
PB-3A
WALTON CORPORATION
DRILLING CONTRACTOR
P.O. Box 1097, NEWARK, DELAWARE 19715
BORING LOG
Run | Depth | RQD | REC
#1 | 16.5-21.5 | 87% | 98%
22.0
31.0

Boring PB-4

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task 2-QP18 **BORING LOG** CME 55 Truck

NAME: BR 1-065 on Parkside Blvd. over Perkins Run PROJECT NO. T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
PB-4	Jason, Cecil, Hector	7/16/18
WEATHER	SURFACE ELEVATION	DATUM:
Sunny	Logger-R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
	0.0	29.3			Blank auger					
RUN 1	29.3	34.3			Rock-wissahickon schist. Recovery 59"=98%. RQD=43%					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUNDWATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
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48-49
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50-51
51-52
52-53
53-54
54-55
55-56
56-57

59" 98%
43%
34.3

T201707105 - PB-4
Page 28 of 63

T201707105

PB-4

R-1 29.3 - 34.3

Rec.
59" 98%

RQD
~~39~~ %
43%

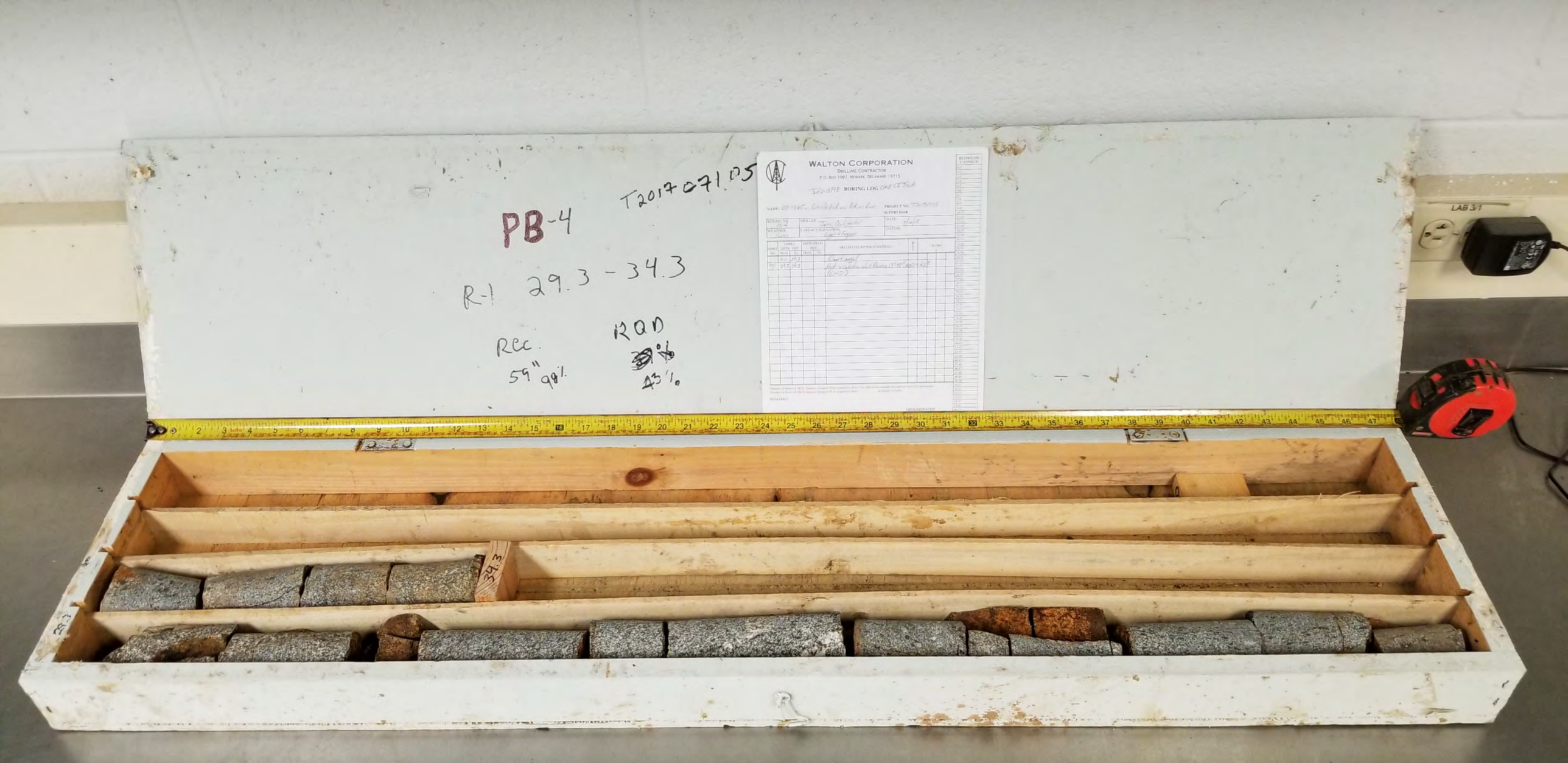
NAME: BR1-

BORING NO. PB-4

WEATHER Sunny

SAMPLE NO.	SAMPLE DEPTH - FE FROM	T
	0.0	29
Run 1	29.3	34

PB-4 T201707105
72 DATA
OHAUS


T201707105
PB-4
R-1 29.3 - 34.3
REC.
59" 98%
RQD
43%
WALTON CORPORATION
DRILLING CONTRACTOR
P.O. Box 1097, NEWARK, DELAWARE 19715
BORING LOG
34.3
29.3

Boring PB-5

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task 2-QP188 BORING LOG CMESSATV

NAME: BR1-065 on Parkside Blvd. over Perkins Run

PROJECT NO. T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
5	Billy, Cecil, Lillian	3/05/19
WEATHER	**SURFACE ELEVATION**	**DATUM:**
Sunny	Logger - R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
	0.0	9.0			blank augers					
RUN 1	9.0	14.0			Rock-granite, Recovery=57% RQD=57%					
RUN 2	14.0	19.0			No sample recovery.					
RUN 3	19.0	24.0			Rock-granite, Recovery=13% RQD=8%					
RUN 4	24.0	29.0			Rock-granite, Recovery=22%; RQD=18%					
RUN 5	29.0	34.0			Rock-granite, Recovery=18%; RQD=18%					
RUN 6	34.0	39.0			Rock-granite, Recovery=35% RQD=20%					
					(END)					

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
12-13
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56-57
57-58

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUNDWATER

19.0
24.0
29.0'
34.0

T201707105 - PB-5
Page 35 of 63

34 39
35
20
240'

(5)

Run	Depth'	Rec %	RQD %
1	9-14	57	57
2	14-19	no sample recovery.	
3	19-24	13	8
4	24-29	22	18
5	29-34	18	18
6	34-39	35	20

5
8
T201707105

8
Depth
Rec%
RQD%
1 — 19-24 92 92
2 — 24-29 97 97
5
Run Depth' Rec% RQD%
1 9-14 57 57
2 14-19 no sample recovery.
3 19-24 13 8
4 24-29 22 18
5 29-34 18 18
6 34-39 35 20

Boring PB-6

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task2-QP18B **BORING LOG** CME45 skid

NAME: Replacement of BR1-065 on Parkside Blvd over Perkins Run **PROJECT NO.** T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
6	Billy, Cecil, Lillian, Zac	3/06/19
WEATHER	**SURFACE ELEVATION**	**DATUM:**
Sunny	Logger-R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A
	0.0	3.0			blank auger		
RUN 1	3.0	8.0			Rock-granite. Recovery=63%. RQD=48%.		
RUN 2	8.0	13.0			Rock-granite. Recovery=44%. RQD=13%.		
RUN 3	13.0	18.0			no recovery.		
RUN 4	18.0	23.0			Rock-broken granite. Recovery=42%. RQD=22%.		
RUN 5	23.0	28.0			Rock-broken granite. Recovery=100%. RQD=88%.		
RUN 6	28.0	33.0			Rock-broken granite. Recovery=97%. RQD=93%.		
					(END)		

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
12-13
13-14
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42-43
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44-45
45-46
46-47
47-48
48-49
49-50
50-51
51-52
52-53
53-54
54-55
55-56
56-57

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUNDWATER

8.0
28.0
33.0

8.0
23.04
28.0

35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61
3.0
18.0
13.0

T201707105

Boring #6

Run	Depth'	Rec %	RQD %
1	3-8	63	48
2	8-13	44	13
3	13-18	No recovery	
4	18-23	42	22
5	23-28	100	88
6	28-33	97	93

6 T201707105
33.0
Durant
GILSON
SA-60

T201707105
Boring #6
Run Depth' Rec% RQD%
1 3-8 63 48
2 8-13 44 13
3 13-18 no recovery
4 18-23 42 22
5 23-28 100 88
6 28-33 97 93
#6
8.0
23.0
28.0
18.0
3.0
33.0

Boring PB-7

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task2-QP18B **BORING LOG** CME455Kid

NAME: Replacement of BR1-065 on Parkside Blvd. over Perkins Run **PROJECT NO.** T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
7	Billy, Cecil, Curt	3/12/19
WEATHER	**SURFACE ELEVATION**	**DATUM:**
Sunny	Logger-R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
	0.0	4.0			blank auger					
RUN 1	4.0	9.0			Rock-broken granite. Recovery=50%; RQD=50%.					
RUN 2	9.0	14.0			Rock-broken granite. Recovery=18%; RQD=18%.					
RUN 3	14.0	19.0			Rock-broken granite. Recovery=17%; RQD=13%.					
RUN 4	19.0	24.0			Rock-broken granite. Recovery=8%; RQD=Ø.					
RUN 5	24.0	29.0			Rock-broken granite. Recovery=82%; RQD=55%.					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUNDWATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
12-13
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52-53
53-54
54-55
55-56
56-57

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36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61
40
24.0

T201707105

Boring #7

Run	Depth	Rec. %	RQD %
1	4-9	50	50
2	9-14	18	18
3	14-19	17	13
4	19-24	8	Ø
5	24-29	82	55

7 T201707105

T201707105
Boring #7
Run Depth Rec. % RQD%
1 4-9 50 50
2 9-14 18 18
3 14-19 17 13
4 19-24 8 Ø
5 24-29 92 55

Boring PB-8

T201707105

WALTON CORPORATION

DRILLING CONTRACTOR

P.O. BOX 1097, NEWARK, DELAWARE 19715

Task 2-18B **BORING LOG** CMESSATV

NAME: BR1-065 on Parkside Blvd. over Perkins Run

PROJECT NO. T201707105

SUPERVISOR

BORING NO.	DRILLER	DATE:
8	Billy, Cecil, Lillian	3/04/19
WEATHER	SURFACE ELEVATION	DATUM:
Sunny	Logger-R. Ferguson	

SAMPLE NO.	SAMPLE DEPTH - FEET FROM	SAMPLE DEPTH - FEET TO	DEPTH STRATA FEET FROM	DEPTH STRATA FEET TO	DRILLER'S DESCRIPTION OF MATERIALS	REC	* BLOWS A			
	0.0	19.0			blank auger					
RUN 1	19.0	24.0			Rock-granite, Recovery=92%, RQD=92%					
RUN 2	24.0	29.0			Rock-granite, Recovery=97%, RQD=97%					
					(END)					

Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.
Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in casing 12 inches.

REMARKS:

GROUNDWATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
10-11
11-12
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45-46
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49-50
50-51
51-52
52-53
53-54
54-55
55-56

29.0'
34.0
19.0
24.0

34.0
14.0 #5
#19.0

34 39
35
20
240'

8

	Depth	Rec%	RQD%
1	19-24	92	92
2	24-29	97	97

5
8
T201707105

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