October 13, 2015

Virginia Department of Transportation
Hampton Roads Materials District
c/o Mr. John Deusebio
1700 N. Main Street
Suffolk, Virginia 23434

VDOT PN: 0264-122-108 (UPC 57048)

ECS Job No. 04:9663-O

Reference: Geotechnical Subsurface Exploration Data Submittal
I-264/I-64 Expansion Project
City of Norfolk, Virginia

Dear Mr. Deusebio:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide this summary of subsurface exploration and geotechnical data for your use to prepare a soil survey report along I-64/I-264 for the proposed expansion project to be located in the City of Norfolk, Virginia. Submitted herein are: a boring location diagram; soil test boring logs in gINT format; and laboratory analysis report sheets. Our geotechnical exploration included performing a total of fifty five soil test borings.

At the time of this data report, all of the required laboratory test results were not yet complete. Additionally, pH, resistivity, and CBR test results were not yet available for bore locations conducted at the proposed storm water management facilities. Upon completion of laboratory tests, this report will be updated to include the subject test results.

We appreciate the opportunity to provide this data submittal to the Virginia Department of Transportation as part of ECS' On-Call Limited Services Geotechnical Design Contract during the design phase of this project. If you should have any questions regarding the information contained in this data report or if we can be of further assistance, please do not hesitate to contact us.

Respectfully,

ECS MID-ATLANTIC, LLC

COMMONWEALTH OF VIRGINIA
MICHAEL J. GALLI
Lic. No. 030684
PROFESSIONAL ENGINEER

David M. Anderson, E.I.T.
Geotechnical Project Engineer

Michael J. Galli, P.E.
VP, Chief Engineer

DMA/MJG/dma

Enclosure 1

Boring Location Diagram

L:\l654888 Ramp D-7\d5704B\Sheets\d5704B03.dgn $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

LIMITED ACCESS HIGHWAY By Resolution of Highway Commission dated december 12, 1963

LIMITED ACCESS HIGHWAY By Resolution of Commonwealth Transportation Board dated October 15, 2014

PROJECT MANAGER Sonu Ja. Hofbeiaec, P.E. (757) 494-5486, Hampton Roads District
SURVEYED BY, DATE Woodpecker Inc. (757) 399-6882 , Danny Williams, L.S. (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Bliss Associates, Inc. (757) 306-4260, June 2015

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	3

RW PLANS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION.

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

Utility Owners:

Water:
City of Virginia Beach Public Utilities
Operations Building, 2nd Floor
Virginia Beach, Virginia 23456
Contact: Josie Totem
Telephone: 757-385-4171

City of Norfolk Utilities
400 Granby Street
Norfolk, Virginia 23501
Contact: Wesley Jones
Telephone: 757-664-6757

Barry Robinson Center (Private Water)
443 Kempsville Road
Norfolk, Virginia 23502
Contact: Len Sandloop
Telephone: 757-455-6170

Force Main:
Hampton Roads Sanitation District
1436 Air Rail Avenue
Virginia Beach, Virginia 23462
Contact: Edward Heady
Telephone: 757-460-7021

City of Virginia Beach Public Utilities
Operations Building, 2nd Floor
Virginia Beach, Virginia 23456
Contact: Josie Totem
Telephone: 757-385-4171

City of Norfolk Utilities
400 Granby Street
Norfolk, Virginia 23501
Contact: Susan Moore
Telephone: 757-664-6701

Gas:
Virginia Natural Gas
3719 East Virginia Beach Boulevard
Norfolk, Virginia 23502
Contact: Victoria Mansfield
Telephone: 757-466-5441

Electric:
Dominion Virginia Power
7500 West Broad Street
Richmond, Virginia 23294
Contact: Lindsey Haller
Telephone: 804-755-5209

Telephone / Fiber Optic:
Verizon
5701 Cleveland Street
Virginia Beach, Virginia 23462
Contact: James Fulton
Telephone: 757-667-5511

Cavalier Telephone
1450 E. Parham Road
Richmond, Virginia 23228
Contact: Megan Shogren
Telephone: 804-422-4264

Level 3 Communications
(Formerly Adelphia / KMC / Telcove)
2600 Eltham Avenue, Suite 103
Norfolk, Virginia 23513
Contact: Rich Eldreth
Telephone: 757-777-7719

City of Virginia Beach Public Schools
Department of Technology
2380 Court Plaza Drive
Virginia Beach, Virginia 23456
Contact: Marty Smith
Telephone: 757-263-1994

KNT
5700 Lake Wright Drive
Norfolk, Virginia 23502
Contact: Junius Joe
Telephone: 757-466-9204

Cable Television:
Cox Communications
5200 Cleveland Street
Virginia Beach, Virginia 23462
Contact: Timothy Hayes
Telephone: 757-222-8902

VDOT Facilities:
VDOT Electric
1700 N. Main Street
Suffolk, Virginia 23435
Contact: Lonnie Ayers
Telephone: 757-934-5030

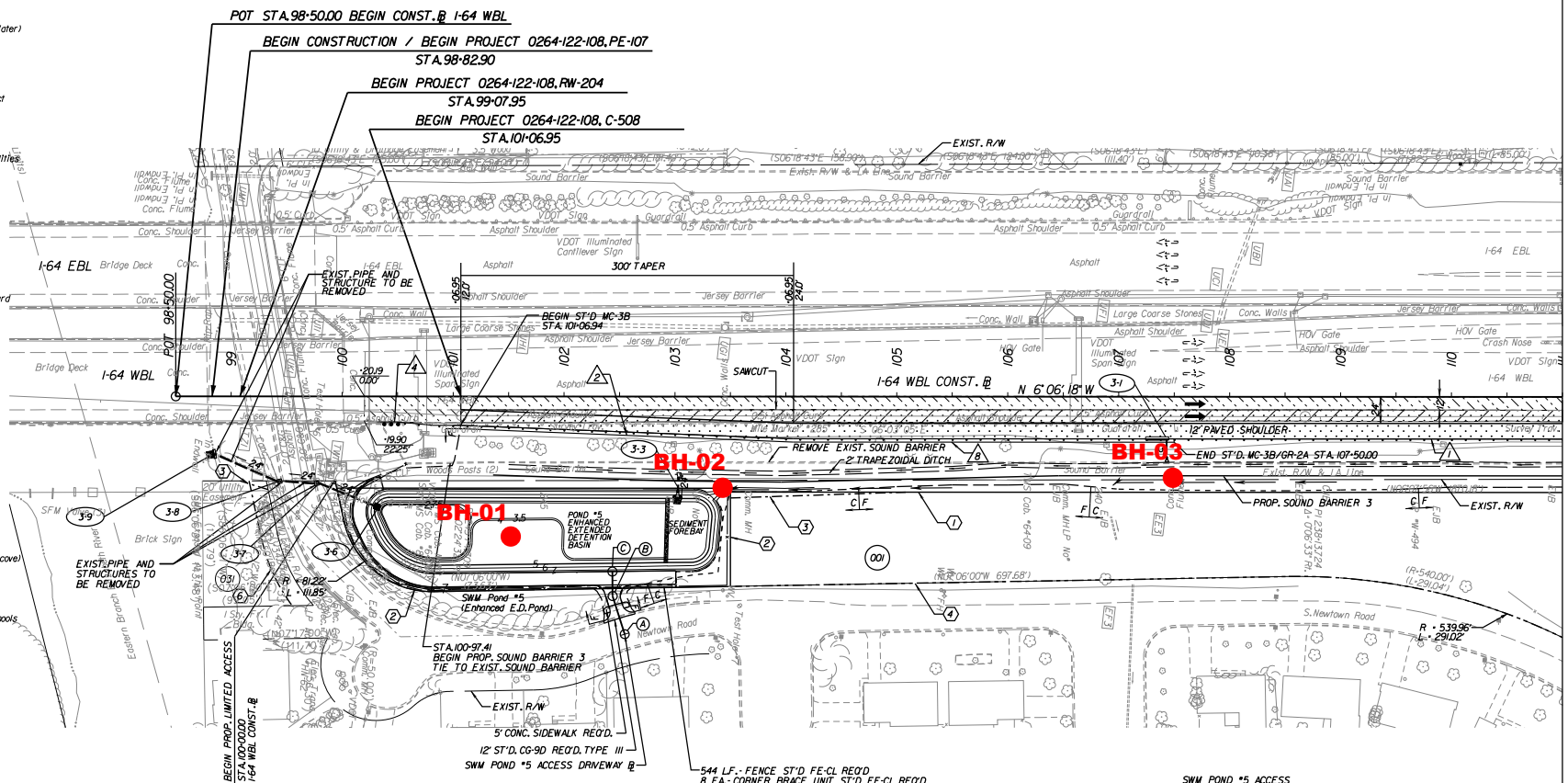
VDOT Traffic Management System (TMS)
970 Resn Drive
Virginia Beach, Virginia 23464
Contact: Neil Reed
Telephone: 757-424-9942

Traffic Control:

City of Norfolk
Dept. of Traffic Engineering
810 Union Street
Norfolk, Virginia 23510
Contact: Daniel Rydzewski
Telephone: 757-664-7300

City of Virginia Beach
Department of Public Works
3556 Dam Neck Road
Virginia Beach, Virginia 23453
Contact: Darwin Dewey
Telephone: 757-617-1857

Communication / Signal:
Norfolk and Southern Railroad
2200 Redgate Avenue
Norfolk, Virginia 23514
Contact: David Swain
Telephone: 757-446-5316



LEGEND

1. DENOTES PROP. R/W & LIMITED ACCESS LINE
2. DENOTES PROP. R/W
3. DENOTES PROP. PERMANENT DRAINAGE EASEMENT
4. DENOTES TEMPORARY CONSTRUCTION EASEMENT
5. DENOTES PROP. PERMANENT AERIAL EASEMENT
6. VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
7. VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

(001) JAMES R. NEWMAN, DAVID L. MCDONALD AND WINFRED K. JONES TRUSTEES OF GLAD TIDINGS CHURCH
D.B. 1530, PG. 666
M.B. 28, PG. 140
10.000 Ac.

(031) BROCK FARMS REALTY, INC.
D.B. 2817, PG. 166
D.B. 2276, PG. 742
No Recorded Acreage

LEGEND

1. STD. GR-2 REQ'D.
2. STD. GR-2A REQ'D.
3. STD. GR-FOA-2 TYPE I REQ'D.
4. STD. GR-FOA-2 TYPE II REQ'D
5. STD. MB-7D REQ'D.
6. STD. MB-7E REQ'D.
7. STD. MB-7F REQ'D.
8. STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL

SWM POND #5 ACCESS DRIVEWAY BASELINE KEY

(A) POT 10+00.00
(B) PI 10+36.03
(C) POT 10+57.99

SCALE 0 50' 100'

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

I-64 WBL PROFILE	3A
DRAINAGE DESCRIPTIONS	9A(1)
BASIN DETAILS	9C(1) - 9C(14)
SOUND BARRIER	14(5)

PROJECT	SHEET NO.
0264-122-108	3

4.38x49 FW

L:\li654888 Ramp D-7\d57048\Sheets\d5704804.dgn $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

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LIMITED ACCESS HIGHWAY By Resolution of Commonwealth Transportation Board dated October 15, 2014

PROJECT MANAGER Saul Ja. Hofbeltanc, P.E. (757) 494-5486, Hampton Roads District
SURVEYED BY, DATE Woodpecker Inc. (757) 399-6882 ; Danny Williams, L.S. (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Rice Associates, Inc. (757) 306-4260 June 2015

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	4

UTILITY OWNERS

SEE PLAN SHEET 3

RW PLANS

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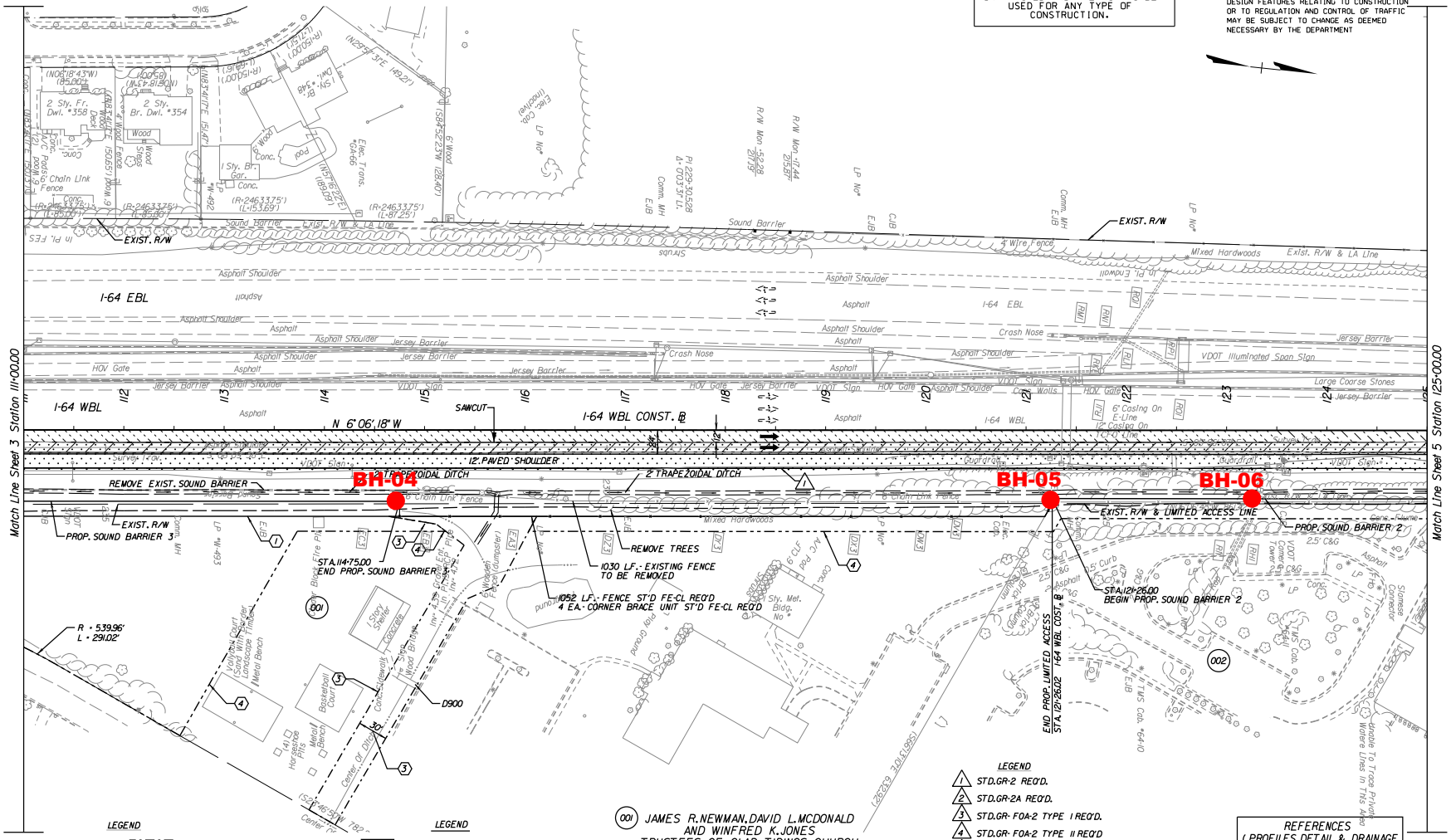
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

I-64 WBL PROFILE	4A
DRAINAGE DESCRIPTIONS	9A(1)
SOUND BARRIER	14(3) - 14(6)

PROJECT	SHEET NO.
0264-122-108	4

6x5x42 RW

L:\i654888 Ramp D-7\d57048\Sheets\d5704805.dgn $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

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DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Rice Associates, Inc. (757) 306-4260 June 2015

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
6-15-15	VA.	264	0264-122-108, RW-204 C-508	5

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UTILITY OWNERS

SEE PLAN SHEET 3

(002) SENTARA LIFE CARE CORPORATION (Formerly ALLIANCE LIFE CARE CORPORATION)
M.B. 140, PG. 140-146
D.B. 1879, PG. 102
12.011 Ac.

(003) BRYAN L. EASON & CARLIMINTA JORDAN
INSTR. #020020887
INSTR. #080000324
M.B. 5, PG. 249
GPIN #1457730096
PARCEL #: 0547-3730
GPIN #1457731014
PARCEL #: 0547-3705
CALCED AC. 0.346

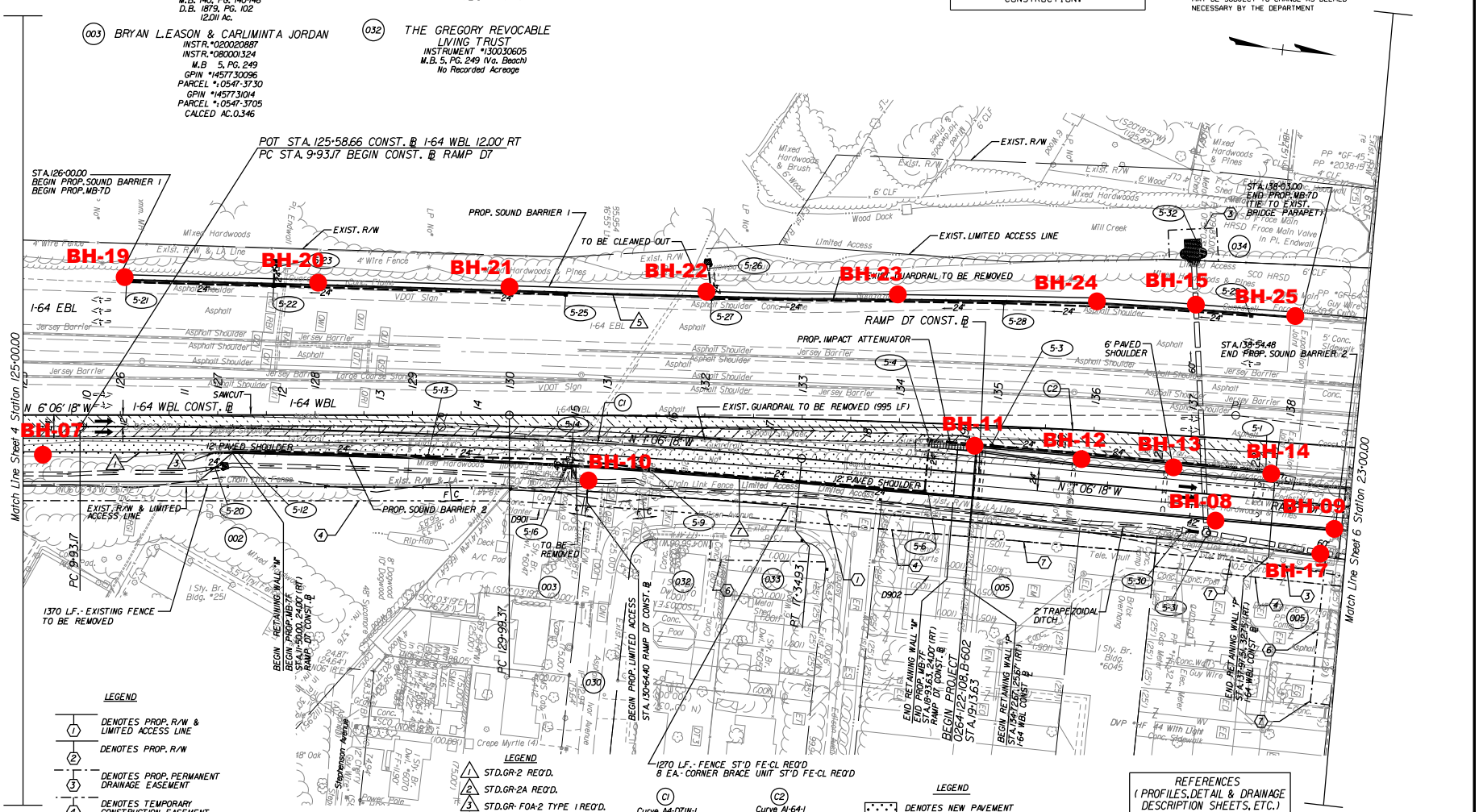
(005) CITY OF NORFOLK
D.B. 823, PG. 426
D.B. 833, PG. 560
M.B. 5, PG. 249 (Va. Beach)
No Recorded Acreage

(030) COMMONWEALTH OF VIRGINIA (VDOT R/W)

(032) THE GREGORY REVOCABLE LIVING TRUST
INSTRUMENT #130030605
M.B. 5, PG. 249 (Va. Beach)
No Recorded Acreage

(033) COMMONWEALTH OF VIRGINIA
D.B. 946, PG. 278
D.B. 981, PG. 41
0.287 Ac.

(034) COMMONWEALTH OF VIRGINIA



LEGEND

1. DENOTES PROP. R/W & LIMITED ACCESS LINE
2. DENOTES PROP. R/W
3. DENOTES PROP. PERMANENT DRAINAGE EASEMENT
4. DENOTES TEMPORARY CONSTRUCTION EASEMENT
5. DENOTES PROP. PERMANENT AERIAL EASEMENT
6. VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
7. VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

LEGEND

1. STD. GR-2 REQ'D.
2. STD. GR-2A REQ'D.
3. STD. GR-FOA-2 TYPE I REQ'D.
4. STD. GR-FOA-2 TYPE II REQ'D
5. STD. MB-7D REQ'D.
6. STD. MB-7E REQ'D.
7. STD. MB-7F REQ'D.
8. STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL

(C1)
Curve A4-D7IN-1
PI = 13+64.29
DELTA = 5° 00' 00.00" (RT)
D = 0° 40' 27"
T = 37.12'
L = 74.76'
R = 8,500.00'
PC = 9+93.17
PT = 17+34.93
Lr = See Profile
E = 2.00%
V = 60

(C2)
Curve A1-64-1
PI = 137+45.15
DELTA = 7° 29' 30.38" (RT)
D = 0° 30' 11"
T = 745.78'
L = 1,489.44'
R = 11,391.00'
PC = 129+99.37
PT = 144+88.81
Lr = See Profile
E = 2.00%
V = 70

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

SCALE 0 50' 100'

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

I-64 WBL PROFILE	5A
RAMP D7 PROFILE	5B
DRAINAGE DESCRIPTIONS	9A(1)
SOUND BARRIER	14(1) - 14(4)
RETAINING WALL PROFILE	15(1)

PROJECT	SHEET NO.
0264-122-108	5

12:40:36 PM

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LIMITED ACCESS HIGHWAY — By Resolution of Commonwealth Transportation Board dated October 15, 2014

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SURVEYED BY, DATE Woodpecker, Inc. (757) 399-6882 ; Danny Williams, LS. (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Rice Associates, Inc. (757) 306-4260 June 2015

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	6

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

RW PLANS

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UTILITY OWNERS

SEE PLAN SHEET 3

LEGEND

- (1) DENOTES PROP. R/W & LIMITED ACCESS LINE
- (2) DENOTES PROP. R/W
- (3) DENOTES PROP. PERMANENT DRAINAGE EASEMENT
- (4) DENOTES TEMPORARY CONSTRUCTION EASEMENT
- (5) DENOTES PROP. PERMANENT AERIAL EASEMENT
- (6) VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
- (7) VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

(006) BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
TAX# 1457744549
2.216 Ac.

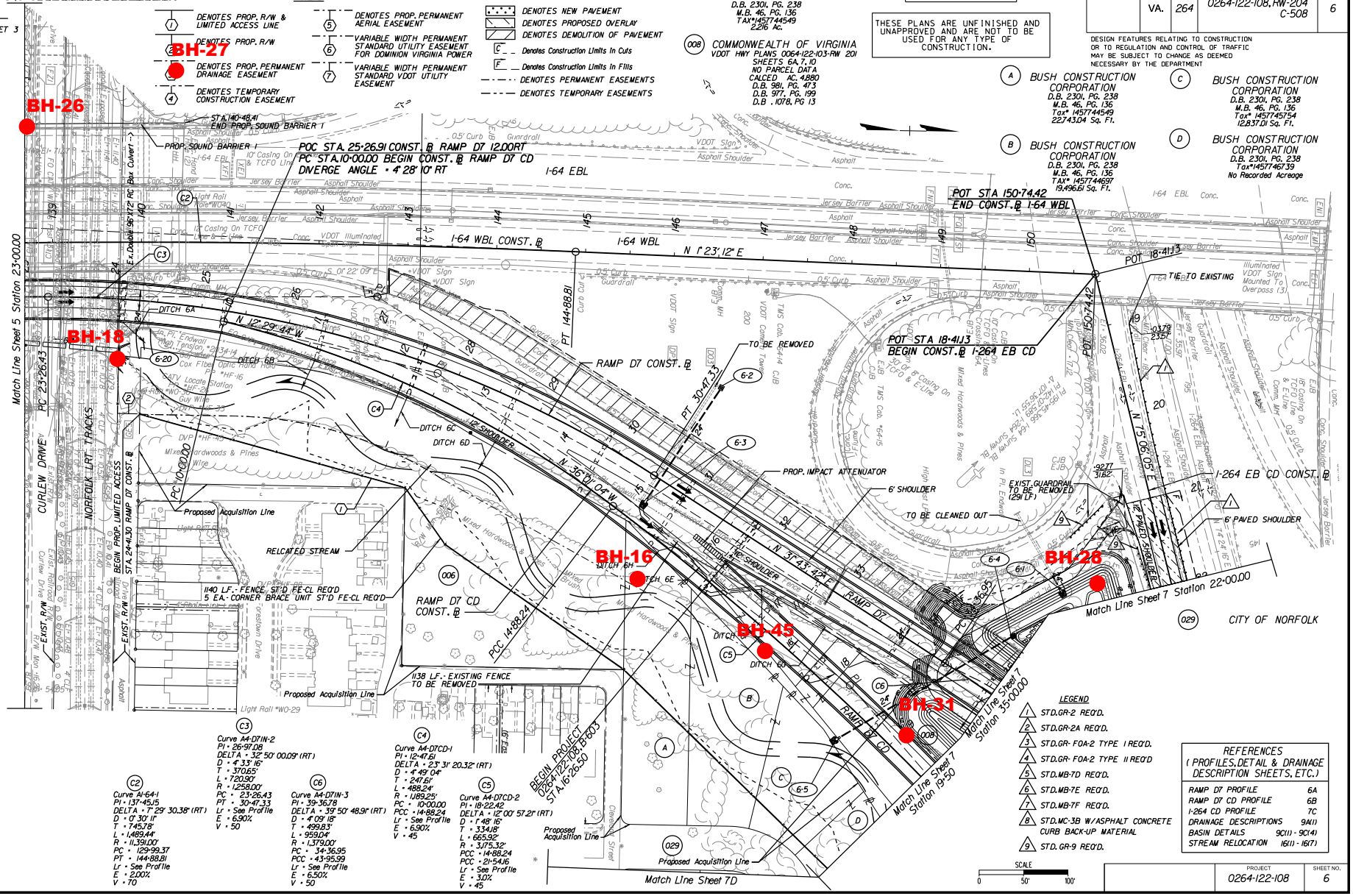
(008) COMMONWEALTH OF VIRGINIA
VDOT HWY PLANS 0064-122-103-RW 201
SHEETS 6A, 7, 10
NO PARCEL DATA
CALCED AC. 4.880
D.B. 981, PG. 473
D.B. 977, PG. 199
D.B. 1078, PG 13

(A) BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
Tax# 1457744549
22,743.04 Sq. Ft.

(B) BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
TAX# 1457744697
19,496.61 Sq. Ft.

(C) BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
Tax# 1457745754
12,837.01 Sq. Ft.

(D) BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
Tax# 1457746739
No Recorded Acreage



(C2) Curve A1-64-1
PI = 137+45.15
DELTA = 7° 29' 30.38" (RT)
D = 0° 30' 11"
T = 745.78'
L = 1,489.44'
R = 11,391.00'
PC = 129+99.37
PT = 144+88.81
Lr = See Profile
E = 2.00%
V = 70

(C3) Curve A4-D7IN-2
PI = 26+97.08
DELTA = 32° 50' 00.09" (RT)
D = 4° 33' 16"
T = 370.65'
L = 720.90'
R = 1,258.00'
PC = 23+26.43
PT = 30+47.33
Lr = See Profile
E = 6.90%
V = 50

(C4) Curve A4-D7CD-1
PI = 12+47.61
DELTA = 23° 31' 20.32" (RT)
D = 4° 49' 04"
T = 247.61'
L = 488.24'
R = 1,189.25'
PC = 10+00.00
PCC = 14+88.24
Lr = See Profile
E = 6.90%
V = 45

(C5) Curve A4-D7CD-2
PI = 18+22.42
DELTA = 12° 00' 57.21" (RT)
D = 1° 48' 16"
T = 334.18'
L = 665.92'
R = 3,175.32'
PCC = 14+88.24
PCC = 21+54.16
Lr = See Profile
E = 3.0%
V = 45

(C6) Curve A4-D7IN-3
PI = 39+36.78
DELTA = 39° 50' 48.91" (RT)
D = 4° 09' 18"
T = 499.83'
L = 959.04'
R = 1,379.00'
PC = 34+36.95
PCC = 43+95.99
Lr = See Profile
E = 6.50%
V = 50

LEGEND

1. STD. GR-2 REQ'D.
2. STD. GR-2A REQ'D.
3. STD. GR-FOA-2 TYPE I REQ'D.
4. STD. GR-FOA-2 TYPE II REQ'D
5. STD. MB-7D REQ'D.
6. STD. MB-7E REQ'D.
7. STD. MB-7F REQ'D.
8. STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL
9. STD. GR-9 REQ'D.

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

RAMP D7 PROFILE	6A
RAMP D7 CD PROFILE	6B
I-264 CD PROFILE	7C
DRAINAGE DESCRIPTIONS	9A(1)
BASIN DETAILS	9C(1) - 9C(4)
STREAM RELOCATION	16(1) - 16(7)

SCALE 0 50' 100'

PROJECT	SHEET NO.
0264-122-108	6

N65505 AW

DGN $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

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DESIGN BY AECOM (757) 499-4224
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	VA.	264	0264-122-108, RW-204 C-508	7

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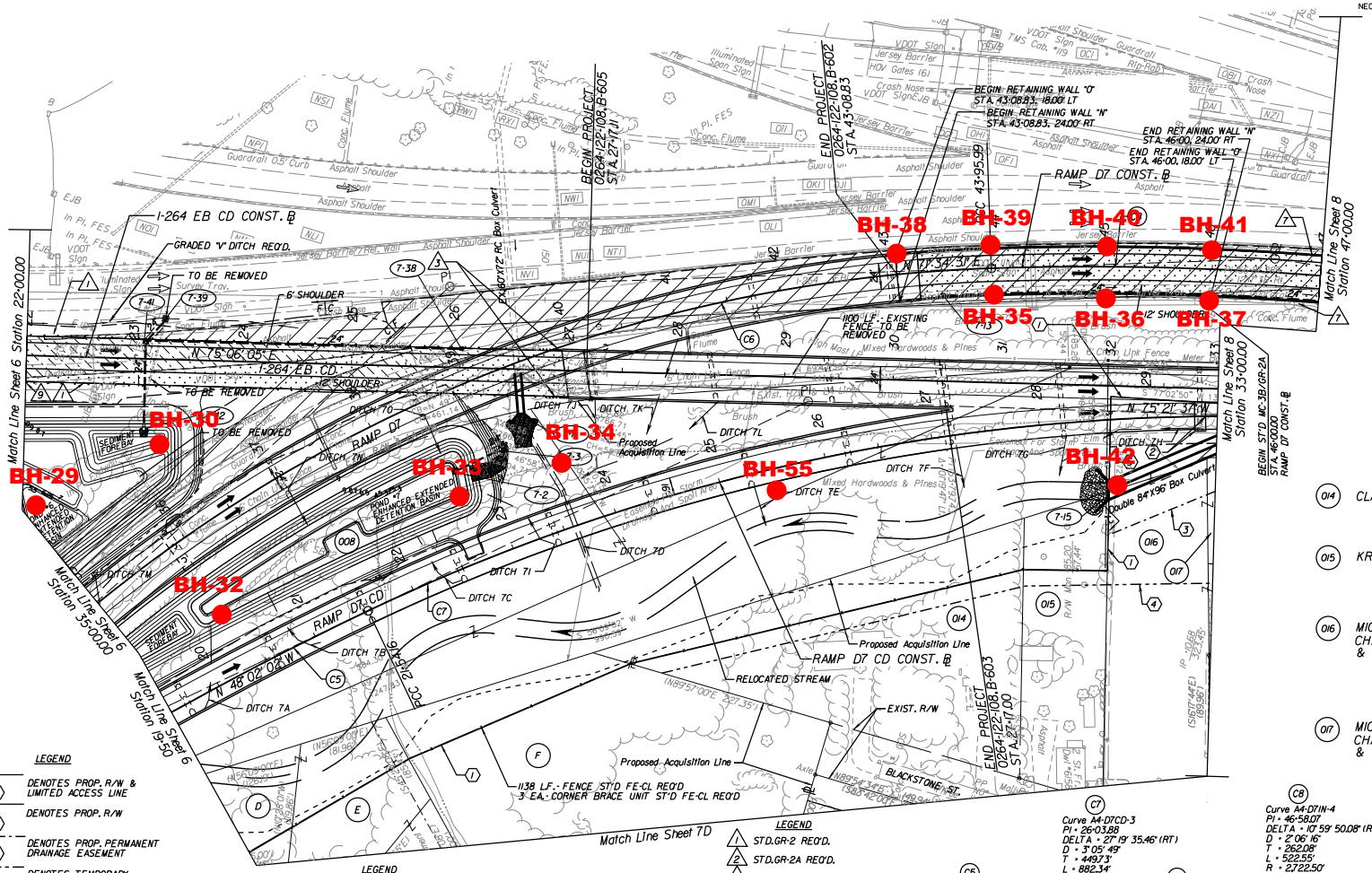
UTILITY OWNERS

SEE PLAN SHEET 3



D — BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
Tax* 1457746739
No Recorded Acreage

E — BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
Tax* 1457747815
14,162.36 Sq. Ft.

F — BUSH CONSTRUCTION CORPORATION
D.B. 2301, PG. 238
M.B. 46, PG. 136
Tax* 1457749944
1.909 AC

008 — COMMONWEALTH OF VIRGINIA
VDOT HWY PLANS 0064-122-103-RW 201
SHEETS 6A, 7, 10
NO PARCEL DATA
CALCED AC. 4.880
D.B. 981, PG. 473
D.B. 977, PG. 199
D.B . 1078, PG 13

014 — CLARENCE H. BLACKMORE
W.B. 626 PG. 84L
M.B. 3, PG. 17
Tax* 1457850069

015 — KRISTOPHER A. CURLING
INSTR. * 100001805
M.B. 3, PG. 17
Tax* 1457854319

016 — MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax* 1457854455
0.49 Ac.

017 — MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax* 1457854487
0.21 Ac.

LEGEND

1 — DENOTES PROP. R/W & LIMITED ACCESS LINE
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6 — VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
7 — VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

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DENOTES PROPOSED OVERLAY
DENOTES DEMOLITION OF PAVEMENT
C — Denotes Construction Limits In Cuts
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DENOTES PERMANENT EASEMENTS
DENOTES TEMPORARY EASEMENTS

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2 — STD. GR-2A REQ'D.
3 — STD. GR-FOA-2 TYPE I REQ'D.
4 — STD. GR-FOA-2 TYPE II REQ'D
5 — STD. MB-7D REQ'D.
6 — STD. MB-7E REQ'D.
7 — STD. MB-7F REQ'D.
8 — STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL
9 — STD. GR-9 REQ'D.

C5
Curve A4-D7CD-2
PI = 18+22.42
DELTA = 12° 00' 57.21" (RT)
D = 1° 48' 16"
T = 3.34.18'
L = 665.92'
R = 3,175.32'
PCC = 14+88.24
PCC = 21+54.16
Lr = See Profile
E = 3.00%
V = 45

C6
Curve A4-D7IN-3
PI = 39+36.78
DELTA = 39° 50' 48.91" (RT)
D = 4° 09' 18"
T = 499.83'
L = 959.04'
R = 1,379.00'
PC = 34+36.95
PCC = 43+95.99
Lr = See Profile
E = 6.50%
V = 50

C7
Curve A4-D7CD-3
PI = 26+03.88
DELTA = 27° 19' 35.46" (RT)
D = 3° 05' 49"
T = 449.73'
L = 882.34'
R = 1,850.00'
PCC = 21+54.16
PT = 30+36.49
Lr = See Profile
E = 4.70%
V = 45

C8
Curve A4-D7IN-4
PI = 46+58.07
DELTA = 10° 59' 50.08" (RT)
D = 2° 06' 16"
T = 262.08'
L = 522.55'
R = 2,722.50'
PCC = 43+95.99
PCC = 49+18.54
Lr = See Profile
E = 4.10%
V = 50

SCALE 0 50' 100'

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

RAMP D7 PROFILE	7A
RAMP D7 CD PROFILE	7B
I-264 CD PROFILE	7C
DRAINAGE DESCRIPTIONS	9A(1)
BASIN DETAILS	9C(1) - 9C(4)
RETAINING WALL PROFILES	15(2)
STREAM RELOCATION	16(1) - 16(7)

PROJECT	SHEET NO.
0264-122-108	7

$TIME$ $TIMEPM$

L:\i654888 Ramp D-7\d57048\Sheets\d5704808.dgn $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

LIMITED ACCESS HIGHWAY By Resolution of Highway Commission dated december 12, 1963

LIMITED ACCESS HIGHWAY By Resolution of Commonwealth Transportation Board dated October 15, 2014

PROJECT MANAGER Sohel Ja. Hafezalaee, P.E. (757) 494-5486, Hampton Roads District
SURVEYED BY, DATE Woodpecker Inc. (757) 399-6882 - Danny Williams, L.S. (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Rice Associates, Inc. (757) 306-4260 June 2015

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	8

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

RW PLANS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION.

UTILITY OWNERS

SEE PLAN SHEET 3

(017) MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax# 1457854487
0.21 Ac.

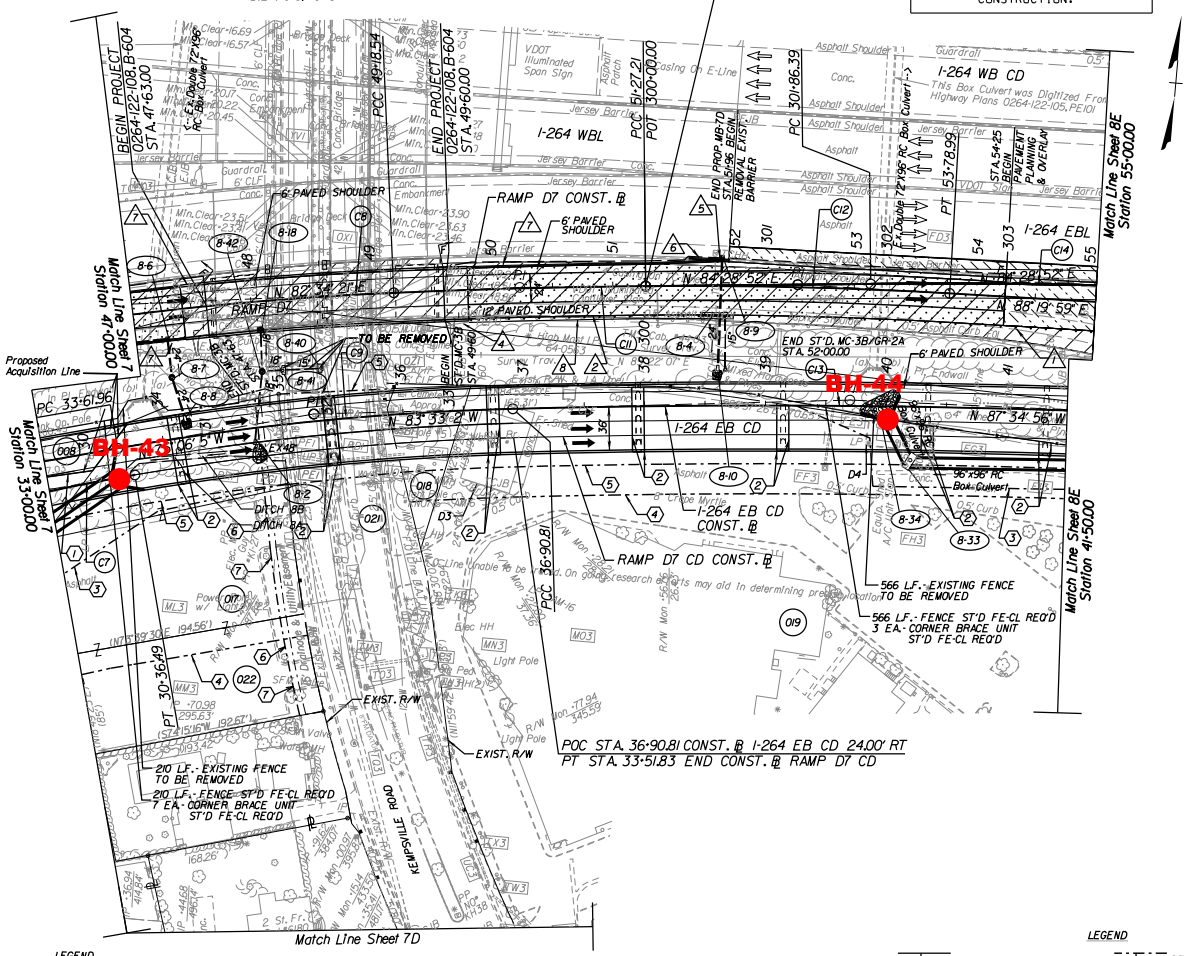
(018) A. A. MASTER ESTATE
D.B. 1039 Pg. 384
D.B. 1057 Pg. 86
Hwy P.B. 4 Pg. 273
NO GPIN#
0.10 Acres

(019) MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
Instr. #060020365, D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax# 1457952365 10.19 Ac.

(021) CITY OF NORFOLK

(022) MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax# 1457855101
0.37 Ac.

(008) COMMONWEALTH OF VIRGINIA
VDOT HWY PLANS 0064-122-103-RW 201
SHEETS 6A, 7, 10
NO PARCEL DATA
CALCED AC. 4.880
D.B. 981, PG. 473
D.B. 977, PG. 199
D.B. 1078, PG 13



(C7)
Curve A4-D7CD-3
PI = 26+03.88
DELTA = 27°19' 35.46" (RT)
D = 3°05' 49"
T = 449.73'
L = 882.34'
R = 1850.00'
PC = 21+54.16
PT = 30+36.49
Lr = See Profile
E = 4.7%
V = 45

(C8)
Curve A4-D7IN-4
PI = 46+58.07
DELTA = 10°59' 50.08" (RT)
D = 2°06' 16"
T = 262.08'
L = 522.55'
R = 2722.50'
PCC = 43+95.99
PT = 49+18.54
Lr = See Profile
E = 4.10%
V = 50

(C9)
Curve A4-CD-1
PI = 35+26.68
DELTA = 8°26' 57.34" (RT)
D = 2°34' 10"
T = 164.72'
L = 328.85'
R = 2230.00'
PC = 33+61.96
PCC = 36+90.81
Lr = See Profile
E = 6.20%
V = 60

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

LEGEND

1. STD. GR-2 REQ'D.
2. STD. GR-2A REQ'D.
3. STD. GR- FOA-2 TYPE I REQ'D.
4. STD. GR- FOA-2 TYPE II REQ'D
5. STD. MB-7D REQ'D.
6. STD. MB-7E REQ'D.
7. STD. MB-7F REQ'D.
8. STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL

(C11)
Curve A4-D7IN-5
PI = 50+22.88
DELTA = 1°54' 30.61" (RT)
D = 0°54' 53"
T = 104.34'
L = 208.67'
R = 6,264.48'
PCC = 49+18.54
PCC = 51+27.21
Lr = See Profile
E = 3.0%
V = 65

(C12)
Curve A4-D7IN-6
PI = 52+53.15
DELTA = 3°51' 07.64" (RT)
D = 1°31' 48"
T = 125.94'
L = 251.78'
R = 3,745.00'
PCC = 51+27.21
PT = 53+78.99
Lr = See Profile
E = 3.10%
V = 50

(C13)
Curve A4-CD-2
PI = 39+70.13
DELTA = 4°01' 53.76" (RT)
D = 0°43' 19"
T = 279.32'
L = 558.41'
R = 7,936.00'
PCC = 36+90.81
PT = 42+49.23
Lr = See Profile
E = 2.20%
V = 60

(C14)
Curve D7CONN-1
PI = 303+89.28
DELTA = 3°51' 54.47" (RT)
D = 0°57' 10"
T = 202.89'
L = 405.63'
R = 6,013.00'
PC = 301+86.39
PT = 305+92.02
Lr = See Profile
E = 2.00%
V = 50

LEGEND

1. DENOTES PROP. R/W & LIMITED ACCESS LINE
2. DENOTES PROP. R/W
3. DENOTES PROP. PERMANENT DRAINAGE EASEMENT
4. DENOTES TEMPORARY CONSTRUCTION EASEMENT
5. DENOTES PROP. PERMANENT AERIAL EASEMENT
6. VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
7. VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

SCALE 0 50' 100'

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

RAMP D7 PROFILE	8A
I-264 EB CD PROFILE	8B
DRAINAGE DESCRIPTIONS	9A(2)
RETAINING WALL PROFILES	15(2)

PROJECT	SHEET NO.
0264-122-F08	8

4-19-06 RW

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$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

LIMITED ACCESS HIGHWAY By Resolution of Highway Commission dated december 12, 1963

LIMITED ACCESS HIGHWAY By Resolution of Commonwealth Transportation Board dated October 15, 2014

PROJECT MANAGER Sohel Ja. Hafbelaec, P.E. (757) 494-5486, Hampton Roads District
SURVEYED BY, DATE Woodpecker, Inc. (757) 399-6882 ; Danny Williams, LS (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Bliss Associates, Inc. (757) 306-4260, June 2015

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	8E

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

RW PLANS

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION.

END CONSTRUCTION 0264-122-108, RW-204, C-508
STA. 46+00.00

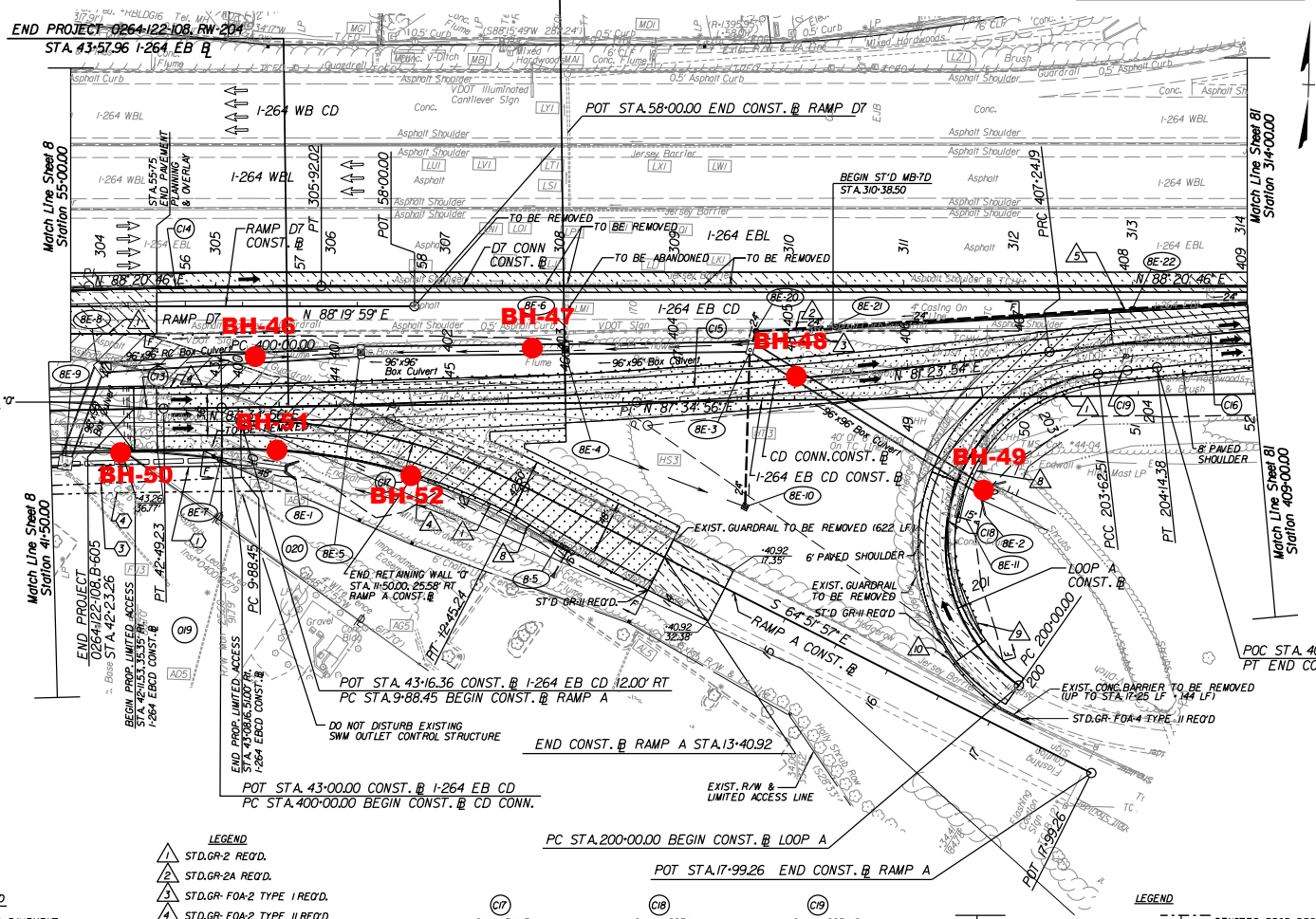
FUTURE PROJECT
BEGIN CONSTRUCTION 0264-134-102, C-501
STA. 46+00.00

END PROJECT 0264-122-108, RW-204, C-508
STA. 46+00.00

BEGIN PROJECT 0264-134-102, PE-101
STA. 46+00.00

END PROJECT 0264-122-108, RW-204
STA. 43+57.96 I-264 EB ℄

UTILITY OWNERS
SEE PLAN SHEET 3



(C13)
Curve A4-CD-2
PI = 39+70.13
DELTA = 4°01' 53.76" (RT)
D = 0° 43' 19"
T = 279.32'
L = 558.41'
R = 7,936.00'
PCC = 36+90.81
PT = 42+49.23
E = 2.20%
V = 60

(C14)
Curve D7CONN-1
PI = 303+89.28
DELTA = 3° 51' 54.47" (RT)
D = 0° 57' 10"
T = 202.89'
L = 405.63'
R = 6,013.00'
PC = 301+86.39
PT = 305+92.02
Lr = See Profile
E = 2.00%
V = 50

(C15)
Curve CDCONN-1
PI = 403+62.45
DELTA = 6° 11' 01.48" (LT)
D = 0° 51' 14"
T = 362.45'
L = 724.19'
R = 6,710.00'
PC = 400+00.00
PRC = 407+24.19
Lr = See Profile
E = NC
V = 45

(C16)
Curve CDCONN-2
PI = 410+55.88
DELTA = 6° 55' 39.18" (RT)
D = 1° 02' 44"
T = 331.69'
L = 662.58'
R = 5,480.00'
PRC = 407+24.19
PT = 413+86.77
Lr = See Profile
E = 2.00%
V = 45

(019) MICHAEL H. NUCKOLS, RONALD C. HUGHES, CHARLES R. RUSH, CHARLES O. ELLIOTT, & LARRY D. WILLIS, TRUSTEES OF FIRST BAPTIST CHURCH OF NORFOLK
Instr. #060020365, D.B. 1797, PG. 802, D.B. 1197, PG. 545
M.B. 61, PG. 21A & 22, M.B. 26 PG. 26, 63
Tax# 1457952365 10.9 Ac.

(020) NEWTOWN MOTEL ASSOCIATES, LC.
INST R. #060045974
M.B. 62 PG. 33 & 34
3.249 Ac.

LEGEND

1. STD. GR-2 REQ'D.
2. STD. GR-2A REQ'D.
3. STD. GR- FOA-2 TYPE I REQ'D.
4. STD. GR- FOA-2 TYPE II REQ'D
5. STD. MB-7D REQ'D.
6. STD. MB-7E REQ'D.
7. STD. MB-7F REQ'D.
8. STD. MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL REQ'D
9. STD. GR-9 REQ'D.
10. ST'D. MB-3A REQ'D

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

(C17)
Curve RAMPA-1
PI = 11+19.38
DELTA = 27° 33' 06.92" (RT)
D = 10° 43' 46"
T = 130.93'
L = 256.79'
R = 534.00'
PC = 9+88.45
PT = 12+45.24
Lr = See Profile
E = 7.00%
V = 35

(C18)
Curve LOOPA-1
PI = 203+95.59
DELTA = 138° 28' 05.79" (RT)
D = 38° 11' 50"
T = 395.59'
L = 362.51'
R = 150.00'
PC = 200+00.00
PCC = 203+62.51
Lr = See Profile
E = 6.80%
V = 20

(C19)
Curve LOOPA-2
PI = 203+88.44
DELTA = 0° 32' 40.99" (RT)
D = 1° 03' 00.51"
T = 25.94'
L = 51.87'
R = 5,456.00'
PCC = 203+62.51
PT = 204+14.38
Lr = See Profile
E = 2.00%
V = 45

LEGEND

1. DENOTES PROP. R/W & LIMITED ACCESS LINE
2. DENOTES PROP. R/W
3. DENOTES PROP. PERMANENT DRAINAGE EASEMENT
4. DENOTES TEMPORARY CONSTRUCTION EASEMENT
5. DENOTES PROP. PERMANENT AERIAL EASEMENT
6. VARIABLE WIDTH PERMANENT STANDARD UTILITY EASEMENT FOR DOMINION VIRGINIA POWER
7. VARIABLE WIDTH PERMANENT STANDARD VDOT UTILITY EASEMENT

SCALE 0 50' 100'

REFERENCES
(PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

RAMP D7 PROFILE	8A
I-264 EB CD PROFILE	8B
DRAINAGE DESCRIPTIONS	9A(2)
RETAINING WALL PROFILES	15(2)

PROJECT	SHEET NO.
0264-122-F08	8E

12/02/25 PW

L:\li654888 Ramp D-7\d57048\Sheets\d57048081.dgn $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

LIMITED ACCESS HIGHWAY By Resolution of Highway Commission dated december 12, 1963

LIMITED ACCESS HIGHWAY By Resolution of Commonwealth Transportation Board dated October 15, 2014

PROJECT MANAGER Saul Ja. Hofbelaec, P.E. (757) 494-5486, Hampton Roads District
SURVEYED BY, DATE Woodpecker, Inc. (757) 399-6882 , Danny Williams, L.S. (757) 925-2656, Hampton Roads District
DESIGN BY AECOM (757) 499-4224
SUBSURFACE UTILITY BY, DATE Bliss Associates, Inc. (757) 306-4260, June 2015

UTILITY OWNERS

SEE PLAN SHEET 3

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	264	0264-122-108, RW-204 C-508	81

RW PLANS

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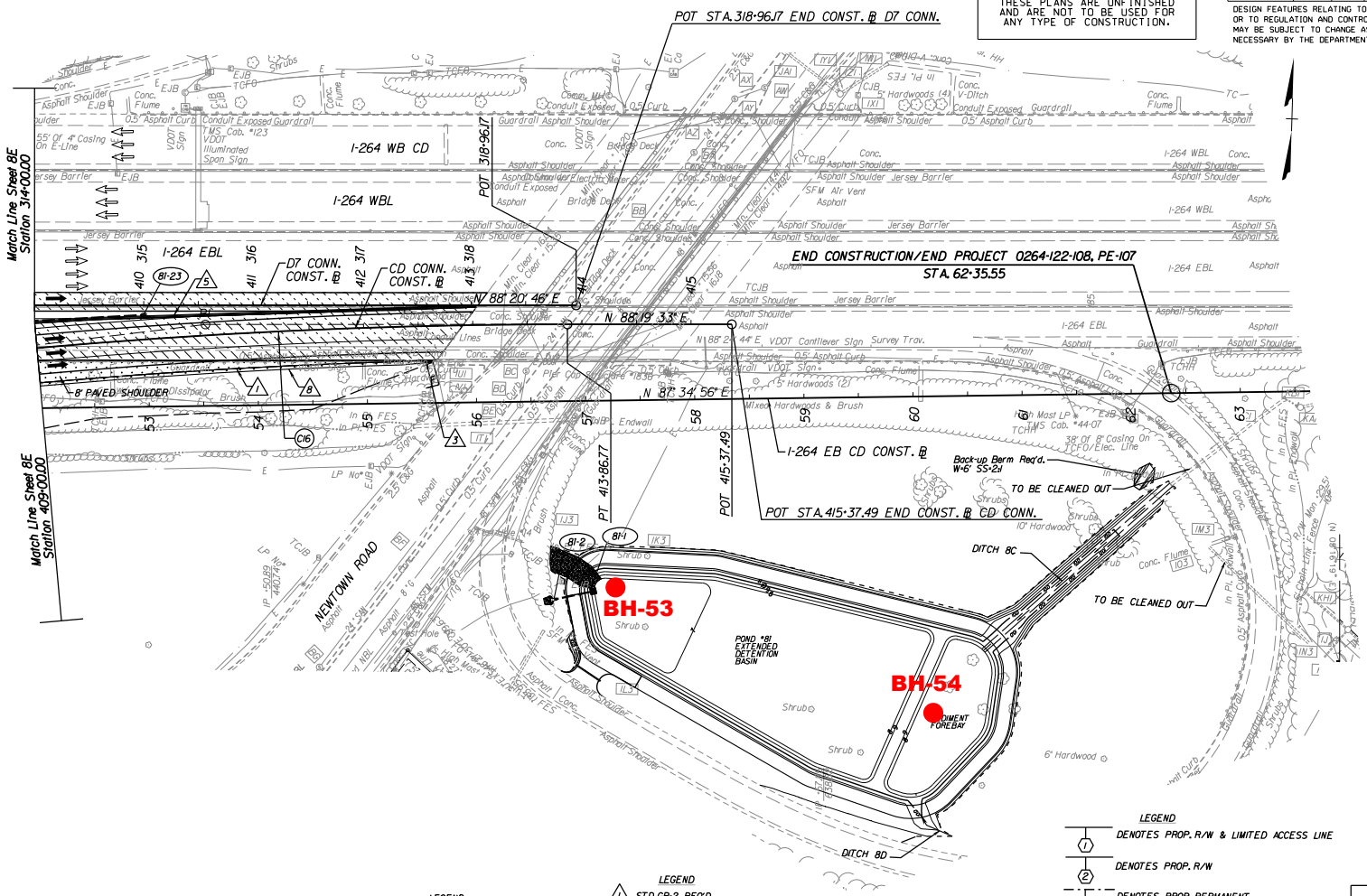
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



(C16)
Curve CDCONN-2
PI = 410+55.88
DELTA = 6°55' 39.8" (RT)
D = 1°02' 44"
T = 331.69'
L = 662.58'
R = 5,480.00'
PRC = 407+24.19
PT = 413+86.77
Lr = See Profile
E = 2.00%
V = 45

LEGEND

- DENOTES NEW PAVEMENT
- DENOTES PROPOSED OVERLAY
- DENOTES DEMOLITION OF PAVEMENT
- C — Denotes Construction Limits In Cuts
- F — Denotes Construction Limits In Fills
- DENOTES PERMANENT EASEMENTS
- DENOTES TEMPORARY EASEMENTS

LEGEND

1. STD.GR-2 REQ'D.
2. STD.GR-2A REQ'D.
3. STD.GR-FOA-2 TYPE I REQ'D.
4. STD.GR-FOA-2 TYPE II REQ'D
5. STD.MB-7D REQ'D.
6. STD.MB-7E REQ'D.
7. STD.MB-7F REQ'D.
8. STD.MC-3B W/ASPHALT CONCRETE CURB BACK-UP MATERIAL

LEGEND

1. DENOTES PROP. R/W & LIMITED ACCESS LINE
2. DENOTES PROP. R/W
3. DENOTES PROP. PERMANENT DRAINAGE EASEMENT
4. DENOTES TEMPORARY CONSTRUCTION EASEMENT
5. DENOTES PROP. PERMANENT AERIAL EASEMENT
6. DENOTES PROP. LIMITED ACCESS LINE

SCALE 0 50' 100'

REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

RAMP D7 PROFILE	8A
I-264 EB CD PROFILE	8B
DRAINAGE DESCRIPTIONS	9A(2)
BASIN DETAILS	9C(1) - 9C(4)
RETAINING WALL PROFILES	15(2)

PROJECT	SHEET NO.
0264-122-F08	81

84200 AW

Enclosure 2

Soil Test Boring Logs

Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #5

BH-01

STATION: I-64WBL 101+50 | OFFSET: 125' RT
LATITUDE: 36.830837° N | LONGITUDE: 76.195010° W
SURFACE ELEVATION: 7.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		3 14 14 8	100						0.0 / 7.0 Topsoil - 4" **TOPS**	31	15	12.3	67.1
2	5	5 5 6 8	50	2					0.3 / 6.7 *FILL,* Brown, fine to coarse, SILTY SAND, trace rock fragments, medium dense, dry **SM**	32	17	15.4	57.8
4		2 2 2 1	70	4					1.5 / 5.5 *ALLUVIUM,* Brown mottled orange, SANDY LEAN CLAY, very stiff, moist **CL** SAME, stiff		NP	15.6	42.5
6		1 2 2 2	50	6					4.0 / 3.0 Brown, fine, SILTY SAND, loose, moist **SM** SAME, wet		NP	18.9	27.7
8	0	WOH WOH 1 1	50	8					SAME, fine to medium, very loose		NP	19.4	25.3
10				10									
12	-5	3 4 5 8	90	13					12.0 / -5.0 Brown-orange, fine to coarse, POORLY GRADED SAND WITH SILT, loose, wet **SP**		NP	14.7	5.1
14				15					Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 45. Bulk sample collected from 3' to 8'.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15
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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-02

STATION: I-64WBL 103+50 OFFSET: 77' RT
LATITUDE: 36.831055° N LONGITUDE: 76.195172° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 9.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		2 3 4 5	100								0.0 / 8.0 Topsoil - 6" **TOPS**			19.1	
2		3 5 8 5	100		2						0.5 / 7.5 *FILL,* Brown, fine to coarse, SILTY SAND, loose, dry **SM**		NP	9.5	27.4
4	5	1 2 2 4	75		4						1.0 / 7.0 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, moist **SM** SAME, light brown, loose			17.6	
6		5 3 3 2	50		6								NP	15.7	16.8
8	0	4 3 6 6	50		8						8.0 / 0.0 Light tan mottled orange, fine, POORLY GRADED SAND WITH SILT, loose, moist **SP-SM** SAME, orange-brown, wet			20.0	
10					10										
12															
14	-5	8 12 11 12	70		13 15						SAME, medium dense			23.6	
16															
18	-10	3 1 1 1	100		18						17.0 / -9.0 Gray, fine, CLAYEY SAND, very loose, wet **SC**			29.9	
20					20										
22															
24	-15	1 1 1/12"	100		23 25							33	9	38.9	48.5
26															
28	-20	WOH WOH WOH WOH	100		28									43.5	
30					30										

REMARKS: Rig Type: CME 45.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

Copyright 2015, Commonwealth of Virginia

Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-02

STATION: I-64WBL 103+50 OFFSET: 77' RT
LATITUDE: 36.831055° N LONGITUDE: 76.195172° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 9.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-25	WOH WOH WOH WOH	100		33–35						32.0 / -24.0 Gray, LEAN CLAY WITH SAND, contains marine shell fragments, very soft, wet **CL**	35	13	37.8	79.4
34															
36															
38	-30	WOH WOH WOH 1	100		38–40									41.5	
40															
42															
	-35	WOH WOH 1 1	100		43–45						42.0 / -34.0 Dark gray, FAT CLAY, trace marine shell fragments, very soft, wet **CH**	57	38	42.6	95.4
44															
46															
48	-40	WOH WOH WOH 1	100		48–50									43.0	
50															
52															
	-45	WOH WOH 1 1	100		53–55						SAME, increasing marine shell fragments @ 53'	64	41	57.9	96.0
54															
56															
58	-50	WOH WOH 3 7	100		58–60										
											59.0 / -51.0 Gray, fine, CLAYEY SAND, very loose, wet **SC**	25	8	35.5	33.1
60															
62															

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-02

STATION: I-64WBL 103+50 OFFSET: 77' RT
LATITUDE: 36.831055° N LONGITUDE: 76.195172° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 9.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
64	-55	4 5 11 7	100		63–65						SAME, medium dense			46.2	
66															
68	-60	13 18 16 18	95		68–70						67.0 / -59.0 Gray, fine, SILTY SAND, dense, wet **SM** SAME, dense			27.7	
70															
72	-65	5 4 8 17	95		73–75						SAME, medium dense			35.3	
74															
76															
78	-70	WOH WOH WOH 2	100		78–80						77.0 / -69.0 Gray, FAT CLAY, very soft, wet **CH**	66	39	62.2	91.0
80											Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-03

STATION: I-64WBL 107+50 OFFSET: 70' RT
LATITUDE: 36.832257° N LONGITUDE: 76.195157° W
SURFACE ELEVATION: 7.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 1 3 3	90						0.0 / 7.0 Topsoil 2" **TOPS**			18.1	
2	5	2 4 4 5	100	2					0.17 / 6.83 *ALLUVIUM,* Orange mottled gray, LEAN CLAY, soft, moist **CL** SAME, firm	36	17	26.8	93.3
4		4 6 8 7	100	4					SAME, stiff			8.0	
6	0	1 2 1 2	95	6					5.0 / 2.0 Orange-tan, fine, SILTY SAND, medium dense, moist **SM** SAME, very loose			23.4	
8 ▽		1 0 2 6	100	8					7.0 / 0.0 Orange mottled gray, LEAN CLAY WITH SAND, soft, wet **CL**			31.7	
10				10					9.5 / -2.5 Orange mottled tan, fine, POORLY GRADED SAND WITH SILT, very loose, wet **SP-SM**				
12	-5			13									
14		5 8 8 10	55	15					SAME, medium dense			20.1	
16													
18	-10	WOH 1 1 1	75	18					17.0 / -10.0 Gray, fine, SILTY SAND, very loose, wet **SM**		NP	31.8	17.4
20				20									
22	-15			23					22.0 / -15.0 Gray, SANDY LEAN CLAY, very soft, wet **CL**				
24		WOH WOH 1 1	100	25						48	26	51.5	62.2
26													
28	-20	WOH WOH 1 1	100	28								40.5	
30				30									

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-03

STATION: I-64WBL 107+50 OFFSET: 70' RT
LATITUDE: 36.832257° N LONGITUDE: 76.195157° W
SURFACE ELEVATION: 7.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32	-25														
34		WOH WOH WOH 1	100		33–35						SAME, contains marine shell fragments	41	17	40.2	78.6
36	-30														
38		WOH WOH WOH WOH	100		38–40									49.7	
42	-35														
44		WOH WOH WOH WOH	100		43–45									45.8	
46	-40														
48		WOH WOH WOH 1	100		48–50							47	29	41.8	79.1
52	-45										52.0 / -45.0 Gray, fine, CLAYEY SAND, contains marine shell fragments, very loose, wet **SC**				
54		WOH WOH WOH 1	100		53–55									50.2	
56	-50										57.0 / -50.0 Gray, LEAN CLAY WITH SAND, very soft, wet **CL**				
58		WOH WOH 1 1	100		58–60							48	28	56.7	71.2
62	-55														

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-03

STATION: I-64WBL 107+50 OFFSET: 70' RT
LATITUDE: 36.832257° N LONGITUDE: 76.195157° W
SURFACE ELEVATION: 7.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/12/15 - 8/12/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											62.0 / -55.0 Gray, FAT CLAY WITH SAND, very soft, wet **CH**				
64		1 1/12" 1	100		63 65						SAME, brown, trace wood fragments	51	30	55.3	74.2
66	-60														
68		WOH 1 1 1	100		68 70						SAME, soft			50.8	
70															
72	-65										72.0 / -65.0 Gray, SANDY FAT CLAY, contains marine shell fragments, very soft, wet **CH**				
74		WOH WOH WOH WOH	100		73 75							53	30	52.2	66.2
76	-70														
78		WOH WOH 3 4	100		78 80									52.8	
80											79.0 / -72.0 Gray, SILTY SAND, trace clay lenses, very loose, wet **SM** Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-04

STATION: I-64WBL 114+75 OFFSET: 75' RT
LATITUDE: 36.834415° N LONGITUDE: 76.195601° W
SURFACE ELEVATION: 9.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		Hand Auger	100								0.0 / 9.0 Topsoil 4" **TOPS**			9.0	
2					2						0.3 / 8.7 *ALLUVIUM,* Brown, fine, CLAYEY SAND, loose, dry **SC**				
		Hand Auger	100									34	19	15.1	49.3
4	5	4 3 2 3	90		4									20.0	
6		2 3 2 2	100		6							35	13	31.1	68.2
8	0	3 3 7 6	90		8						7.0 / 2.0 Brown, SANDY LEAN CLAY, firm, moist **CL**			15.0	
10					10						9.5 / -0.5 Tan, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**				
12															
14	-5	10 9 11 8	50		13 15						SAME, medium dense			22.1	
16											14.25 / -5.25 Gray, fine, SILTY SAND, medium dense, wet **SM**				
18	-10	1 2 1 1	75		18 20						SAME, very loose		NP	24.0	12.3
20															
22											22.0 / -13.0 Gray, SANDY FAT CLAY, contains marine shell fragments, very soft, wet **CH**				
24	-15	2 1 1 1	70		23 25							53	29	46.2	61.1
26															
28	-20	WOH WOH 1 1	100		28 30									44.7	

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-04

STATION: I-64WBL 114+75 OFFSET: 75' RT
LATITUDE: 36.834415° N LONGITUDE: 76.195601° W
SURFACE ELEVATION: 9.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.5 ft DEPTH

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-25	WOH WOH WOH 1	100		33						SAME, increasing marine shell fragments			46.2	
36			100		35										
					37										
38	-30	WOH 1 1 1	100		38						37.5 / -28.5 Gray, LEAN CLAY, very soft, wet **CL**	44	20	40.1	85.2
40					40										
42															
44	-35	WOH WOH 1 1	100		43						SAME, trace marine shell fragments			39.4	
					45										
46															
48	-40	WOH WOH 1 1	100		48							47	28	42.9	91.7
50					50										
52															
54	-45	WOH WOH WOH 1	100		53									51.0	
					55										
56															
58	-50	WOH WOH 1 1	100		58						57.0 / -48.0 Gray, FAT CLAY WITH SAND, very soft, wet **CH**	63	40	53.2	77.6
60					60										
62															

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #3

BH-04

STATION: I-64WBL 114+75 OFFSET: 75' RT
LATITUDE: 36.834415° N LONGITUDE: 76.195601° W
SURFACE ELEVATION: 9.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
64	-55	WOH 2 1 1	100		63–65						SAME, soft			49.6	
66															
68	-60	3 3 5 5	85		68–70						67.0 / -58.0 Gray, fine, CLAYEY SAND, contains clay lenses, loose, wet **SC**	31	11	37.0	28.0
70															
72															
74	-65	2 2 5 6	85		73–75									36.4	
76											74.5 / -65.5 Gray, fine, SILTY SAND, loose, wet **SM**				
78	-70	2 2 1 1	20		78–80						77.0 / -68.0 Gray, SANDY FAT CLAY, soft, wet **CH**			47.6	
80											Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-05

STATION: I-64WBL 121+25 OFFSET: 70' RT
LATITUDE: 36.836165° N LONGITUDE: 76.195829° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		Hand Auger	100								0.0 / 8.0 Topsoil 2" **TOPS**			10.4	
2					2						0.2 / 7.8 *ALLUVIUM,* Brown, fine, CLAYEY SAND, dry **SC**				
	5	Hand Auger	100											12.0	
4		5 5 5 3	70		4						SAME, brown mottled orange, medium dense, moist			17.6	
6		2 2 5 6	60		6						6.0 / 2.0 Orange-brown, FAT CLAY, firm, moist **CH**	50	27	27.2	86.8
8	0	5 5 6 6	70		8						8.0 / 0.0 Orange-brown, LEAN CLAY WITH SAND, stiff, wet **CL**	43	26	29.9	72.8
10					10										
12											12.0 / -4.0 Tan, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**				
	-5	3 4 3 3	50		13										
14					15									21.9	
16															
18	-10	6 9 9 12	55		18						SAME, medium dense			22.7	
20					20										
22															
	-15	6 7 9 10	45		23										
24					25									22.6	
26															
28	-20	2 1 3 3	50		28						SAME, orange-brown, loose			29.1	
30					30						29.3 / -21.3 Gray, fine, CLAYEY SAND, contains marine shell fragments, loose, wet **SC**				

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-05

STATION: I-64WBL 121+25 OFFSET: 70' RT
LATITUDE: 36.836165° N LONGITUDE: 76.195829° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-25	4 3 2 2	40		33–35							37	14	35.6	49.7
34															
36															
38	-30	WOH WOH WOH 1	50		38–40						37.0 / -29.0 Gray, LEAN CLAY WITH SAND, contains marine shell fragments, very soft, wet **CL**	41	16	41.1	81.8
40															
42															
	-35	WOH WOH 1 1	100		43–45									41.7	
44															
46															
48	-40	WOH WOH 1 1	100		48–50						47.0 / -39.0 Gray, LEAN CLAY, very soft, wet **CL**	49	22	45.5	93.7
50															
52															
	-45	WOH WOH WOH 1	100		53–55									54.0	
54															
56															
58	-50	WOH WOH 1 2	100		58–60						57.0 / -49.0 Gray, SANDY FAT CLAY, contains marine shell fragments, very soft, wet **CH**	52	30	56.4	62.6
60															
62															

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-05

STATION: I-64WBL 121+25 OFFSET: 70' RT
LATITUDE: 36.836165° N LONGITUDE: 76.195829° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/13/15 - 8/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	-55	3 3 4 4	75		63–65						SAME, firm	31	13	38.6	40.8
64											64.3 / -56.3 Gray, fine, CLAYEY SAND, loose, wet **SC**				
66															
68	-60	2 5 6 6	70		68–70						SAME, medium dense			32.8	
70															
72															
	-65	4 5 6 7	50		73–75									32.9	
74															
76															
78	-70	4 5 5 7	100		78–80							36	21	41.4	39.1
80											Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-06

STATION: I-64WBL 123+25 OFFSET: 70' RT
LATITUDE: 36.836767° N LONGITUDE: 76.195826° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/19/15 - 8/19/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 4.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		Hand Auger	100								0.0 / 8.0 *ALLUVIUM,* Brown mottled orange, fine, CLAYEY/SILTY SAND, dry **SC-SM**			9.4	
2					2						SAME, moist				
	5	Hand Auger	100											6.6	
4 ∇		1 1 1 2	75		4						SAME, very loose, wet			24.0	
6		1 1 1 1	75		6						6.0 / 2.0 Orange-brown, fine to medium, POORLY GRADED SAND WITH SILT, very loose, wet **SP-SM**	20	5	19.5	40.9
8	0	2 2 5 6	100		8						SAME, loose		NP	21.4	10.1
10					10						9.5 / -1.5 Orange-gray, fine, SILTY SAND, loose, wet **SM**				
12															
	-5	3 5 6 6	65		13 15						SAME, orange-ten, medium dense			23.3	
16															
18	-10	1 2 4 5	65		18						17.0 / -9.0 Tan, fine to coarse, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**			19.2	
20					20										
22															
	-15	3 8 10 10	95		23 25						SAME, orange-tan, medium dense		NP	22.4	6.0
26															
28	-20	10 12 12 13	70		28									26.2	
30					30										

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-06

STATION: I-64WBL 123+25 OFFSET: 70' RT
LATITUDE: 36.836767° N LONGITUDE: 76.195826° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/19/15 - 8/19/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 4.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-25	9 12 15 16	70		33–35									24.2	
34															
36															
38	-30	8 15 8 3	45		38–40						SAME, contains marine shell fragments		NP	20.8	7.5
40															
42											42.0 / -34.0 Gray, LEAN CLAY WITH SAND, contains marine shell fragments, very soft, wet **CL**				
	-35	WOH WOH WOH 2	100		43–45							41	18	39.4	81.4
44															
46			100		45–47							48	26	42.1	93.1
48	-40	WOH 1 1 1	100		48–50						47.0 / -39.0 Gray, FAT CLAY WITH SAND, soft, wet **CH**	57	27	48.1	72.2
50															
52											52.0 / -44.0 Gray, SANDY FAT CLAY, soft, wet **CH**				
	-45	WOH WOH 2 2	100		53–55							53	32	39.4	55.9
54															
56															
58	-50	4 6 6 7	75		58–60						57.0 / -49.0 Gray, fine, CLAYEY SAND, medium dense, wet **SC**			28.6	
60															
62															

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-06

STATION: I-64WBL 123+25 OFFSET: 70' RT
LATITUDE: 36.836767° N LONGITUDE: 76.195826° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/19/15 - 8/19/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 4.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											62.0 / -54.0 Gray, fine, SILTY SAND, medium dense, wet **SM**				
64	-55	3 6 6 7	70		63 65									31.7	
66															
68	-60	5 9 10 10	70		68 70						SAME, trace marine shell fragments			27.7	
70															
72															
74	-65	4 9 9 7	50		73 75									29.0	
76															
78	-70	1 3 4 5	100		78 80						SAME, loose 78.5 / -70.5 Gray, fine, CLAYEY SAND, very loose, wet **SC**	45	21	42.3	33.6
80											Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 45. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-07

STATION: Ramp D7 9+50 OFFSET: 15' RT
LATITUDE: 36.837345° N LONGITUDE: 76.196089° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/13/15 - 9/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 12.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		- 12 10 9	60								0.0 / 12.0 Asphalt 6" **ASPH**			12.1	
2	10	7 9 12 11	70		2						0.5 / 11.5 Gravel 4" **CRA**				
4		4 4 5 7	90		4						0.8 / 11.2 *FILL,* Tan, fine, SILTY SAND, medium dense, dry **SM**			19.4	
6	5	7 6 5 5	100		6						5.3 / 6.7 *ALLUVIUM,* Gray mottled orange, FAT CLAY, stiff, moist **CH**	50	27	28.0 28.7	90.2 88.6
8		5 5 12 9	90		8						SAME, very stiff			11.6	
10					10						9.5 / 2.5 Light tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**				
12	0				13										
14		6 5 6 6	50		15						SAME, wet			21.1	
16	-5														
18		3 4 5 6	40		18						SAME, loose		NP	22.3	8.7
20					20										
22	-10				23										
24		4 7 11 9	50		25						SAME, medium dense			23.6	
26	-15														
28		3 5 9 12	70		28						SAME, trave gravel			19.0	
30					30										

REMARKS: Rig Type: CME 55. Boring conducted in shoulder due to inaccessibility at 60' offset.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-07

STATION: Ramp D7 9+50 OFFSET: 15' RT
LATITUDE: 36.837345° N LONGITUDE: 76.196089° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/13/15 - 9/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 12.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32	-20														
		10 13 14 15	65		33–35						SAME, yellow-tan		NP	24.4	5.7
34															
36															
	-25														
38		9 14 13 13	65		38–40									23.4	
40															
42	-30														
		13 15 19 19	70		43–45						SAME, dense		NP	25.1	7.7
44															
46															
	-35														
48		10 12 12 11	70		48–50						SAME, medium dense			24.8	
50															
52	-40														
		9 11 10 8	50		53–55									24.4	
54															
56															
	-45														
58		14 15 14 9	60		58–60						SAME, gray			24.1	
60															
62	-50														

REMARKS: Rig Type: CME 55. Boring conducted in shoulder due to inaccessibility at 60' offset.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-07

STATION: Ramp D7 9+50 OFFSET: 15' RT
LATITUDE: 36.837345° N LONGITUDE: 76.196089° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/13/15 - 9/13/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 12.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											62.0 / -50.0 Gray, fine, CLAYEY/SILTY SAND, loose, wet **SC-SM**				
64		1 3 4 6	75		63–65							25	6	38.6	28.1
66															
	-55														
68		7 9 8 10	70		68–70						SAME, medium dense			30.2	
70															
72	-60										72.0 / -60.0 Gray, fine, SILTY SAND, contains clay lenses, medium dense, wet **SM**				
74		5 6 8 9	50		73–75								NP	29.5	12.1
76															
	-65														
78		15 31 23 21	70		78–80						SAME, very dense		NP	9.9	10.9
80											79.0 / -67.0 Gray, fine to coarse, POORLY GRADED SAND WITH SILT, dense, wet **SP-SM** Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 55. Boring conducted in shoulder due to inaccessibility at 60' offset.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-08

STATION: Ramp D7 21+65 OFFSET: 50' RT
LATITUDE: 36.840495° N LONGITUDE: 76.196099° W
SURFACE ELEVATION: 11.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 9.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °: STRATA	DIP °: JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	10	Hand Auger	100								0.0 / 11.0 Topsoil 3" **TOPS**			8.2
2					2						0.3 / 10.7 *ALLUVIUM,* Tan mottled orange, fine, CLAYEY SAND, medium dense, dry **SC**			
		Hand Auger	100											13.3
4		10 11 12 10	50		4						SAME, moist			12.2
6	5	15 12 11 7	75		6									6.2
8		8 5 3 1	75		8						7.0 / 4.0 Tan-gray, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM** SAME, loose, wet			16.6
10					10									
	0													
12					13									
14		2 5 7 7	70		15						SAME, medium dense			21.1
16	-5													
18		6 9 10 11	70		18									20.9
20					20									
	-10													
22					23						22.0 / -11.0 Gray, fine, SILTY SAND, contains marine shell fragments, very loose, wet **SM**			
24		2 1 1 1	100		25									28.6
26	-15													
28		1 3 2 1	100		28						SAME, loose			28.8
30					30									
	-20													

REMARKS: Rig Type: CME 55. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-08

STATION: Ramp D7 21+65 OFFSET: 50' RT
LATITUDE: 36.840495° N LONGITUDE: 76.196099° W
SURFACE ELEVATION: 11.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 9.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32											32.0 / -21.0 Gray, SANDY FAT CLAY, very soft, wet **CH**			
		WOH WOH 1 1	100		33–35									36.6
34														
36	-25													
38		WOH WOH WOH 1	100		38–40									32.3
40														
	-30													
42														
		WOH WOH WOH 1	100		43–45									35.3
44														
46	-35													
48		1 1 0 1	100		48–50									27.6
50											Boring Terminated at 50' Below Ground Surface			

REMARKS: Rig Type: CME 55. Hand Augered to 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-09

STATION: Ramp D7 22+85 OFFSET: 50' RT
LATITUDE: 36.840862° N LONGITUDE: 76.196064° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 6 8 4	45								0.0 / 10.0 Topsoil 3" **TOPS**			11.8	
2		6 7 4 5	45		2						0.3 / 9.7 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, moist **SM**			9.6	
4	5	3 4 11 6	50		4									69.3	45.9
6		4 1 1 1	65		6						5.5 / 4.5 Brown-gray, fine to medium, CLAYEY SAND, contains root fragments, very loose, moist **SC**	73	44	46.8	38.6
8 ▽		WOH 1 1 1	85		8						SAME, wet			44.7	
10	0				10						9.8 / 0.2 Gray, fine, SILTY SAND, very loose, wet **SM**				
12					13										
14		12 4 3 5	0		15						SAME, contains large wood debris, loose				
16	-5														
18		3 2 2 1	65		18									25.8	
20	-10				20										
22					23						22.0 / -12.0 Gray, SANDY FAT CLAY, trace marine shell fragments, very soft, wet **CH**				
24		WOH WOH WOH 1	80											36.1	
26	-15				25										
28		WOH 1 1 1	70		28						27.0 / -17.0 Gray, fine, CLAYEY SAND, trace marine shell fragments, very loose, wet **SC**			32.2	
30	-20				30										

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-09

STATION: Ramp D7 22+85 OFFSET: 50' RT
LATITUDE: 36.840862° N LONGITUDE: 76.196064° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-25	WOH WOH WOH WOH	75		33–35						32.0 / -22.0 Gray, SANDY LEAN CLAY, very soft, wet **CL**	33	9	31.6	60.9
36															
38	-30	1 1 1 1	35		38–40						37.0 / -27.0 Gray, fine, CLAYEY SAND, very loose, wet **SC**			28.3	
40															
42															
44	-35	3 2 1 2	75		43–45									31.4	
46															
48		WOH WOH 7 5	85		48–50						47.0 / -37.0 Gray, SANDY FAT CLAY, soft, wet **CH**			30.7	
50	-40										49.3 / -39.3 Gray, fine, SILTY SAND, loose, wet **SM**				
52															
54	-45	5 3 3 6	90		53–55						54.5 / -44.5 Gray, SANDY FAT CLAY, firm, wet **CH**			30.9	
56															
58	-50	7 6 5 5	90		58–60						58.5 / -48.5 Gray, fine, SILTY SAND, contains clay lenses, medium dense, wet **SM**			37.3	
60															
62															

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #2

BH-09

STATION: Ramp D7 22+85 OFFSET: 50' RT
LATITUDE: 36.840862° N LONGITUDE: 76.196064° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											62.0 / -52.0 Gray, FAT CLAY WITH SAND, soft, wet **CH**				
64	-55	4 2 2 2	100		63–65									57.0	
66															
68		WOH 2 2 4	100		68–70									50.3	
70	-60														
72											72.0 / -62.0 Gray, fine, SILTY SAND, contains clay lenses, medium dense, wet **SM**				
74	-65	7 6 9 9	70		73–75									29.0	
76															
78		3 4 4 4	100		78–80						SAME, loose			37.1	
80	-70										Boring Terminated at 80' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 48" PIPE EXT (5-16)

BH-10

STATION: Ramp D7 15+15 OFFSET: 45' RT
LATITUDE: 36.838872° N LONGITUDE: 76.195861° W
SURFACE ELEVATION: 5.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		Hand Auger	100								0.0 / 5.0 Topsoil 6" **TOPS**			3.5	
2		Hand Auger	100		2						0.5 / 4.5 *FILL,* Orange-tan, fine, POORLY GRADED SAND WITH SILT, contains gravel, medium dense, moist **SP-SM**			5.5	
4	0	4 4 5 4	90		4						3.0 / 2.0 *ALLUVIUM,* Tan mottled orange, fine, CLAYEY SAND, loose, moist **SC**			24.1	
6		9 5 4 3	100		6						6.5 / -1.5 Tan-orange, LEAN CLAY WITH SAND, stiff, moist **CL**	35	13	24.9	71.7
8 ∇		5 7 6 5	100		8						SAME, wet			23.1	
10	-5				10										
12											12.0 / -7.0 Orange-tan, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**				
14		4 4 9 9	65		13									22.9	
16	-10				15										
18		5 7 5 8	70		18									20.6	
20	-15				20										
22											22.0 / -17.0 Orange-brown, fine, SILTY SAND, medium dense, wet **SM**				
24		8 6 6 7	50		23									24.0	
26	-20				25										
28		WOH WOH WOH 1	100		28						27.0 / -22.0 Gray, SANDY LEAN CLAY, very soft, wet **CL**			52.4	
30	-25				30										

REMARKS: Rig Type: CME 55.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 48" PIPE EXT (5-16)

BH-10

STATION: Ramp D7 15+15 OFFSET: 45' RT
LATITUDE: 36.838872° N LONGITUDE: 76.195861° W
SURFACE ELEVATION: 5.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-30	WOH WOH WOH 2	100		33–35									59.6	
36															
38	-35	WOH WOH 1 2	35		38–40									68.4	
42															
44	-40	WOH WOH WOH 2	100		43–45									41.1	
46															
48	-45	WOH WOH WOH 3	100		48–50							35	11	36.1	53.9
50											Boring Terminated at 50' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-11

STATION: I-64WBL 134+75 OFFSET: 22' RT
LATITUDE: 36.839444° N LONGITUDE: 76.196111° W
SURFACE ELEVATION: 28.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/30/15 - 8/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		11 9 6	100		1.5 2						0.0 / 28.0 Asphalt 7" **ASPH**			7.4	
2		5 5 5 5									0.6 / 27.4 Gravel 3" **CRA**				
	25		70								0.8 / 27.2 *FILL,* Tan, fine, SILTY SAND, medium dense, moist **SM**			11.1	
4		2 3 3 4	75		4						SAME, loose			8.8	45.4
6		2 2 3 3	50		6						5.8 / 22.2 Gray-orange, fine, CLAYEY SAND, loose, moist **SC**			11.5	33.9
8	20	2 5 8 13	50		8						SAME, medium dense			9.9	
10					10						9.0 / 19.0 *ALLUVIUM,* Tan mottled orange, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**				
12															
	15	8 9 11 12	75		13 15						12.0 / 16.0 Gray, fine, CLAYEY SAND, contains marine shell fragments, medium dense, moist **SC**			15.0	
16															
18	10	12 7 8 9	65		18 20						17.0 / 11.0 Gray, LEAN CLAY, stiff, wet **CL**	49	26	23.1	89.1
20															
22															
	5	2 2 2 2	100		23 25						22.0 / 6.0 Gray, LEAN CLAY WITH SAND, soft, wet **CL**			30.2	78.0
24															
26															
28	0	10 9 15 12	50		28 30						29.0 / -1.0 Orange-tan, fine, POORLY GRADED SAND, medium dense, wet **SP**			17.4	
30															

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-11

STATION: I-64WBL 134+75 OFFSET: 22' RT
LATITUDE: 36.839444° N LONGITUDE: 76.196111° W
SURFACE ELEVATION: 28.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/30/15 - 8/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

FIELD DATA												LAB DATA			
		SOIL				ROCK									
								DIP °							
DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											Boring Terminated at 30' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-12

STATION: I-64WBL 135+75 OFFSET: 25' RT
LATITUDE: 36.846667° N LONGITUDE: 76.191667° W
SURFACE ELEVATION: 29.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/31/15 - 8/31/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °: STRATA	DIP °: JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		12 10	90		1						0.0 / 29.0 Asphalt 10" **ASPH**			9.2
2		5 6			2						0.9 / 28.1 Gravel 3" **CRA**			
		5 5	90								1.1 / 27.9 *FILL,* Tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			6.4
4	25	3 3			4									
		3 2	50								4.0 / 25.0 Tan-orange, fine, CLAYEY SAND, loose, moist **SC**			11.0
6		2 2			6									
		2 2	75								7.0 / 22.0 Orange-tan, fine, SILTY SAND, loose, moist **SM**			16.2
8		2 2			8									
	20	2 2	70											7.7
10					10									
12														
		6 7			13						SAME, medium dense			
14	15	4 10	50		15									14.4
16														
18		12 18			18						17.0 / 12.0 *ALLUVIUM,* Gray mottled orange, fine, SILTY SAND, contains marine shell fragments, dense, moist **SM**			
	10	26 16	75											10.6
20					20									
22														
		3 4			23						SAME, loose			
24	5	3 4	90		25									26.5
26														
28 ▽		5 4			28						27.0 / 2.0 Orange-tan, fine, POORLY GRADED SAND, loose, wet **SP**			
	0	5 9	75											19.5
30					30						Boring Terminated at 30' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-13

STATION: I-64WBL 136+75 OFFSET: 28' RT
LATITUDE: 36.840000° N LONGITUDE: 76.196667° W
SURFACE ELEVATION: 30.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/31/15 - 8/31/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		9 7	80		1						0.0 / 30.0 Asphalt 9.5" **ASPH**			10.8	
2		4 4			2						0.8 / 29.2 Gravel 4" **CRA**				
		3 3	85								1.1 / 28.9 *FILL,* Tan, fine, SILTY SAND, loose, moist **SM**	21	3	20.0	26.8
4		3 3			4										
	25	2 3	50								5.0 / 25.0 Light tan, fine, POORLY GRADED SAND, loose, moist **SP**			5.1	
6		2 3			6										
		3 4	60								6.0 / 24.0 Orange-gray, fine, CLAYEY SAND, loose, moist **SC**		NP	14.6	14.3
8		3 5			8						7.5 / 22.5 Light brown, fine, SILTY SAND, medium dense, moist **SM**				
		7 7	70											8.4	
10	20				10										
12															
		10 12			13										
14		17 18	75											7.3	
	15				15										
16															
18		10 9			18						17.0 / 13.0 *ALLUVIUM,* Gray, fine, SILTY SAND, medium dense, moist **SM**				
		11 16	75										NP	22.6	13.6
20	10				20										
22															
		4 4			23										
24		6 6	85								23.5 / 6.5 Tan mottled orange, LEAN CLAY, stiff, moist **CL**	38	14	24.2	91.5
	5				25										
26															
28		5 7			28						27.0 / 3.0 Orange-tan, fine, SILTY SAND, medium dense, wet **SM**				
		8 10	70											20.0	
30	0				30						29.0 / 1.0 Tan, fine, POORLY GRADED SAND, medium dense, wet **SP**				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-13

STATION: I-64WBL 136+75 OFFSET: 28' RT
LATITUDE: 36.840000° N LONGITUDE: 76.196667° W
SURFACE ELEVATION: 30.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/31/15 - 8/31/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

FIELD DATA											LAB DATA			
		SOIL				ROCK								
								DIP °						
DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	STRATA LEGEND	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
											LL	PI		

FIELD DESCRIPTION OF STRATA

Boring Terminated at 30' Below Ground Surface

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "P"

BH-14

STATION: I-64WBL 137+75 OFFSET: 31' RT
LATITUDE: 36.840556° N LONGITUDE: 76.196389° W
SURFACE ELEVATION: 31.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/31/15 - 8/31/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	30	19 18	70		1						0.0 / 31.0 Asphalt 8" **ASPH**			7.9
2		4 5 5 7	75		2						0.6 / 30.4 Gravel 3" **CRA**			
4		5 4 4 5	100		4						0.9 / 30.1 *FILL,* Tan, fine, SILTY SAND, contains gravel, medium dense, moist **SM**			5.0
6	25	3 3 4 4	75		6						2.0 / 29.0 Light tan, fine, POORLY GRADED SAND, medium dense, moist **SP**			10.1
8		8 6 4 5	100		8						4.0 / 27.0 Orange-gray, fine, SILTY SAND, loose, moist **SM**			8.7
10					10						8.5 / 22.5 Light brown, fine, POORLY GRADED SAND WITH SILT, loose, moist **SP-SM**			14.2
12	20										9.5 / 21.5 Brown, fine, CLAYEY SAND, contains marine shell fragments, medium dense, moist **SC**			
14		9 10 15 16	65		13 15						12.0 / 19.0 Orange-tan, fine, POORLY GRADED SAND, medium dense, moist **SP**			14.3
16	15													
18		5 5 6 7	75		18						17.0 / 14.0 *ALLUVIUM,* Gray, fine, CLAYEY SAND, medium dense, moist **SC**			14.7
20	10				20									
22											22.0 / 9.0 Gray, fine, SILTY SAND, contains marine shell fragments, medium dense, wet **SM**			
24		12 9 12 14	85		23 25									18.9
26	5													
28		8 10 11 17	55		28 30									15.6
											Boring Terminated at 30' Below Ground Surface			

REMARKS: Rig Type: CME 55.

SPT_LOG:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 60" PIPE (5-32)

BH-15

STATION: I-64WBL 137+00 OFFSET: 32' LT
LATITUDE: 36.823889° N LONGITUDE: 76.208056° W
SURFACE ELEVATION: 31.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/1/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
	30	12 14 10	73		1.5						0.0 / 31.0 Asphalt 3" **ASPH**		NP	8.4	17.9
2		15 9 10 11	50		2						0.3 / 30.7 Gravel 4" **CRA**				
4		10 10 9 8	35		4						0.6 / 30.4 *FILL,* Tan to gray, fine, SILTY SAND, contains gravel, medium dense, moist **SM**			12.8 10.3	
6	25	12 14 16 17	45		6						SAME, contains marine shell fragments, dense			9.4	
8		19 15 12 12	75		8						SAME, red-orange, medium dense			11.9	
10					10										
	20														
12					13						12.0 / 19.0 Gray, SANDY LEAN CLAY, hard, moist **CL**				
14		7 15 22 18	80		15						14.0 / 17.0 Gray-tan, fine, SILTY SAND, contains marine shell fragments, dense, moist **SM**			17.9	
16	15														
18		14 13 12 9	70		18						SAME, medium dense		NP	18.4	17.1
20					20										
	10														
22					23										
24		12 14 14 10	75		25									18.9	
26	5														
28		19 24 27 22	75		28						27.0 / 4.0 *ALLUVIUM,* Tan-orange, fine, POORLY GRADED SAND WITH SILT, very dense, moist **SP-SM**			12.6	
30					30										
	0														

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 60" PIPE (5-32)

BH-15

STATION: I-64WBL 137+00 OFFSET: 32' LT
LATITUDE: 36.823889° N LONGITUDE: 76.208056° W
SURFACE ELEVATION: 31.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/1/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 28.0 ft DEPTH

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34		16 19 24 24	65		33 35								NP	18.7	9.9

Boring Terminated at 35' Below Ground Surface

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 108"X96"BC

BH-16

STATION: Ramp D7CD 15+40 OFFSET: 30' RT
LATITUDE: 36.842877° N LONGITUDE: 76.195051° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/9/15 - 10/9/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °: STRATA	DIP °: JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		11 2 1 4	25								0.0 / 8.0 *FILL,* Debris FILL **FL**			
2	5	2 3 1 2	75		2						2.0 / 6.0 *ALLUVIUM,* Brown, fine, SILTY SAND, very loose, moist **SM**			
4		1 1 1 2	100		4						3.5 / 4.5 Gray-brown, fine, CLAYEY SAND, contains wood fragments, very loose, wet **SC**			
6 ▽		WOH WOH WOH WOH	100		6									
8	0	WOH WOH WOH WOH	100		8						7.0 / 1.0 Gray-black, ORGANIC CLAY, contains wood fragments, very soft, wet **OH**			
10					10									
12											12.0 / -4.0 Gray, fine, POORLY GRADED SAND WITH SILT, very loose, wet **SP-SM**			
14	-5	WOH 2 1 1	75		13 15									
16														
18	-10	5 11 12 12	65		18						SAME, medium dense			
20					20									
22											22.0 / -14.0 Gray, FAT CLAY WITH SAND, very soft, wet **CH**			
24	-15	WOH WOH WOH WOH	100		23 25									
26														
28	-20	2 2 2 2	100		28						27.0 / -19.0 Gray, fine, SILTY SAND, loose, wet **SM**			
30					30						Boring Terminated at 30' Below Ground Surface			

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 42" PIPE (5-31)

BH-17

STATION: I-64WBL 138+50 OFFSET: 100' RT
LATITUDE: 36.840889° N LONGITUDE: 76.959500° W
SURFACE ELEVATION: 9.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/20/15 - 8/20/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		Hand Auger	100								0.0 / 9.0 Topsoil 3" **TOPS**			6.5
2					2						0.3 / 8.7 *ALLUVIUM,* Tan, fine, SILTY SAND, contains root fragments, moist **SM**			
		Hand Auger	100											6.8
4	5	1 2 1 1	90		4						4.0 / 5.0 Black, ORGANIC CLAY, contains root fragments, soft, moist **OH**			40.3
6		3 2 2 1	0		6									
8	0	1 2 1 1	25		8									22.6
10					10									
12											12.0 / -3.0 Black-gray, SANDY FAT CLAY, soft, wet **CH**			
14	-5	1 2 2 1	100		13									43.9
16					15						14.8 / -5.8 Gray, fine, CLAYEY SAND, very loose, wet **SC**			
18	-10	2 1 2 2	60		18						17.0 / -8.0 Gray, fine, POORLY GRADED SAND WITH SILT, very loose, wet **SP-SM**			63.4
20					20						Boring Terminated at 20' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 60" PIPE (6-20)

BH-18

STATION: I-64WBL 139+70 OFFSET: 110' RT
LATITUDE: 36.841219° N LONGITUDE: 76.195696° W
SURFACE ELEVATION: 5.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		4 11 9 7	70						0.0 / 5.0 Topsoil 3" **TOPS**			10.8	
2		6 4 4 4	55	2					0.3 / 4.7 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, dry **SM**			42.2	
4		2 2 2 2	75	4					2.5 / 2.5 Gray, LEAN CLAY WITH SAND, firm, moist **CL** SAME, soft, wet			19.2	
6	0	WOH 1 2 2	100	6								24.2	
8		1 2 2 5	100	8					7.0 / -2.0 Gray, fine, POORLY GRADED SAND WITH SILT, very loose, wet **SP-SM**			18.3	45.5
10	-5			10					8.5 / -3.5 Gray, fine, CLAYEY SAND, loose, wet **SC**				
12													
14		5 4 6 11	70	13 15					12.0 / -7.0 Tan to gray, POORLY GRADED SAND, medium dense, wet **SP**			23.3	
16	-10												
18		WOH 1 1 2	75	18 20					17.0 / -12.0 Gray, fine, SILTY SAND, very loose, wet **SM**			27.4	
20	-15												
22													
24		WOH 1 2 2	75	23 25								26.1	
26	-20												
28		3 2 1 2	85	28 30								32.8	
30	-25												

REMARKS: Rig Type: CME 55.

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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 60" PIPE (6-20)

BH-18

STATION: I-64WBL 139+70 OFFSET: 110' RT
LATITUDE: 36.841219° N LONGITUDE: 76.195696° W
SURFACE ELEVATION: 5.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA											LAB DATA			
DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-30	2 WOH 1 1	35		33 35									33.2	
36															
38		WOH 1 1 1	100		38 40						37.0 / -32.0 Gray, LEAN CLAY WITH SAND, soft, wet **CL**			38.7	
40	-35														
42															
44	-40	WOH WOH 1 1	100		43 45						SAME, very soft	35	14	35.7	71.7
46															
48		1 1 1 2	100		48 50						47.0 / -42.0 Gray, fine, SILTY SAND, very loose, wet **SM**			30.7	
50	-45														
52															
54	-50	3 8 6 7	70		53 55						SAME, medium dense			27.7	
56															
58		10 8 5 5	70		58 60									44.2	
60	-55										59.5 / -54.5 Gray, FAT CLAY, contains marine shell fragments, soft, wet **CH**				
62															

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 60" PIPE (6-20)

BH-18

STATION: I-64WBL 139+70 OFFSET: 110' RT
LATITUDE: 36.841219° N LONGITUDE: 76.195696° W
SURFACE ELEVATION: 5.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
64	-60	WOH 1 1 4	100		63–65						SAME, soft	78	45	59.1	93.8
66															
68		WOH 1 1 2	100		68–70									60.2	
70	-65	2 3 3 3	100		70–72						SAME, firm			59.8	
72											Boring Terminated at 72' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-19

STATION: I-64WBL 126+00 OFFSET: 140' LT
LATITUDE: 36.837582° N LONGITUDE: 76.196575° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		18 49 14	87		1.5						0.0 / 12.0 Asphalt 7" **ASPH**			17.7
2	10	17 15 16 14	70		2						0.6 / 11.4 Gravel 4" **CRA**			
4		4 3 4 5	70		4						0.9 / 11.1 *FILL,* Orange-tan, fine, SILTY SAND, contains gravel, very dense, moist **SM**			19.7
6	5	4 5 6 4	95		6						4.0 / 8.0 *ALLUVIUM,* Orange-tan, SANDY LEAN CLAY, firm, moist **CL**			26.8
8		6 4 4 3	100		8						SAME, stiff			30.4
10					10						8.0 / 4.0 Tan-orange, fine, CLAYEY SAND, loose, moist **SC**			23.7
12	0	2 8 8 10	75		13						12.0 / 0.0 Yellow-tan, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**			
14 ∇					15									22.4
16	-5	8 10 10 11	65		18									
18					20									21.8
20														
22	-10	5 8 12 10	50		23									
24					25									22.4
26	-15													
28		8 12 18 15	60		28						SAME, dense			22.9
30					30									

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-19

STATION: I-64WBL 126+00 OFFSET: 140' LT
LATITUDE: 36.837582° N LONGITUDE: 76.196575° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32	-20	6 7 7 7	50		33–35						SAME, medium dense			25.6
34														
36	-25													
38		5 5 7 6	50		38–40									24.9
40											39.5 / -27.5 Tan, fine, POORLY GRADED SAND, medium dense, wet **SP**			
42	-30													
44		8 6 6 7	50		43–45									24.4
46	-35													
48		12 12 15 13	50		48–50									20.0
50											Boring Terminated at 50' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-20

STATION: I-64WBL 128+00 OFFSET: 140' LT
LATITUDE: 36.838001° N LONGITUDE: 76.196778° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/4/15 - 9/4/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		12 26 44	67		1.5						0.0 / 12.0 Asphalt 8" **ASPH**			5.6	
2	10	15 16 17 17	50		2						0.7 / 11.3 Gravel 3" **CRA**				
4		15 10 10 14	50		4						0.9 / 11.1 *FILL,* Orange-tan, fine, SILTY SAND, contains gravel, dense, moist **SM** SAME, medium dense			15.0 12.0	
6	5	7 7 7 6	65		6						5.8 / 6.2 Brown mottled orange, fine, CLAYEY SAND, medium dense, moist **SC**	58	28	28.0	78.4
8		9 7 10 11	100		8						7.3 / 4.7 *ALLUVIUM,* Brown mottled orange, FAT CLAY WITH SAND, stiff, moist **CH** SAME, very stiff	21	3	16.8	40.1
10					10						9.5 / 2.5 Orange-brown, fine, SILTY SAND, medium dense, wet **SM**				
12	0														
14		5 7 9 7	65		13 15									20.6	
16	-5														
18		2 3 3 4	50		18 20						SAME, loose			21.8	
22	-10														
24		5 4 7 8	50		23 25						SAME, medium dense			22.3	
26	-15														
28		4 6 8 9	50		28 30								NP	24.4	13.1

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-20

STATION: I-64WBL 128+00 OFFSET: 140' LT
LATITUDE: 36.838001° N LONGITUDE: 76.196778° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/4/15 - 9/4/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32	-20	8 9 12 10	50		33–35						SAME, tan, trace gravel			18.4	
34															
36	-25														
38		17 18 19 20	60		38–40						SAME, dense			23.2	
40															
42	-30														
44		12 15 15 17	60		43–45						SAME, gray-tan			22.2	
46															
48	-35	15 20 19 19	60		48–50									23.3	
50											Boring Terminated at 50' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-21

STATION: I-64WBL 130+00 OFFSET: 140' LT
LATITUDE: 36.838454° N LONGITUDE: 76.196753° W
SURFACE ELEVATION: 16.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/4/15 - 9/4/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	15	12 7 6	53		1.5						0.0 / 16.0 Asphalt 6" **ASPH**			14.9
2		5 7 10 10	70		2						0.5 / 15.5 Gravel 3" **CRA**			
4		9 8 8 9	60		4						0.8 / 15.2 *FILL,* Brown, fine, SILTY SAND, medium dense, moist **SM**			13.7
6	10	4 4 5 6	100		6						6.0 / 10.0 Brown, fine, CLAYEY SAND, loose, moist **SC**			15.7
8		7 7 7 7	100		8						SAME, medium dense			11.2
10 ∇	5				10									14.8
12		2 2 2 2	45		13						12.0 / 4.0 *ALLUVIUM,* Tan, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**			
14					15									24.6
16	0													
18		5 4 2 3	50		18									19.8
20	-5				20						19.5 / -3.5 Gray-brown, fine, SILTY SAND, loose, wet **SM**			
22		3 4 5 4	50		23									
24					25									21.4
26	-10													
28		7 7 10 11	40		28						28.0 / -12.0 Light tan, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**			21.4
30	-15				30									

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-21

STATION: I-64WBL 130+00 OFFSET: 140' LT
LATITUDE: 36.838454° N LONGITUDE: 76.196753° W
SURFACE ELEVATION: 16.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/4/15 - 9/4/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32														
34		7 9 8 10	40		33–35									22.2
36	-20													
38		8 10 11 12	45		38–40									20.6
40														
42	-25													
44		8 8 12 13	50		43–45									21.3
46	-30													
48		8 6 7 9	40		48–50						SAME, trace gravel			19.4
50											Boring Terminated at 50' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-22

STATION: I-64WBL 132+00 OFFSET: 140' LT
LATITUDE: 36.834444° N LONGITUDE: 76.202500° W
SURFACE ELEVATION: 22.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/2/15 - 9/2/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		13 10 10	93		1.5						0.0 / 22.0 Asphalt 8" **ASPH**			11.1	
2	20	6 7 8 8	70		2						0.7 / 21.3 Gravel 4" **CRA**				
4		6 5 6 7	50		4						1.0 / 21.0 *FILL,* Tan, fine, CLAYEY/SILTY SAND, medium dense, moist **SC/SM**			11.8	
6	15	7 9 8 9	75		6						SAME, contains marine shell fragments			14.1	
8		6 6 7 6	85		8									10.1	
10					10							22	6	15.1	38.0
12	10										12.0 / 10.0 *ALLUVIUM,* Tan to brown, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**				
		9 9 10 11	50		13 15									12.7	
16	5										17.0 / 5.0 Tan, fine, SILTY SAND, medium dense, wet **SM**				
18		8 7 7 7	50		18 20									20.1	
22	0										22.0 / 0.0 Light tan, fine, POORLY GRADED SAND WITH SILT, dense, wet **SP-SM**				
24		10 15 17 15	85		23 25								NP	20.4	11.3
26	-5														
28		10 9 8 6	70		28 30						SAME, medium dense			21.1	

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-22

STATION: I-64WBL 132+00 OFFSET: 140' LT
LATITUDE: 36.834444° N LONGITUDE: 76.202500° W
SURFACE ELEVATION: 22.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/2/15 - 9/2/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32	-10	7 16 21 15	85		33–35						SAME, dense		NP	21.4	7.1
34															
36	-15														
38		10 8 11 10	75		38–40						SAME, trace gravel, medium dense			22.5	
40															
42	-20														
44		6 5 5 4	80		43–45									18.3	
46	-25														
48		5 5 5 7	50		48–50									36.3	
50											Boring Terminated at 50' Below Ground Surface				

REMARKS: Rig Type: CME 55.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-23

STATION: I-64WBL 134+00 OFFSET: 140' LT
LATITUDE: 36.832500° N LONGITUDE: 76.186667° W
SURFACE ELEVATION: 28.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/2/15 - 9/2/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		10 11 8	67		1.5						0.0 / 28.0 Asphalt 7" **ASPH**			15.2
2		11 11 12 11	50		2						0.7 / 27.3 Gravel 5" **CRA**			
4	25	12 9 11 13	35		4						1.0 / 27.0 *FILL,* Orange-tan, fine, CLAYEY SAND, contains gravel, medium dense, moist **SC**			10.3
6		15 10 11 8	100		6						2.0 / 26.0 Orange-tan, fine, SILTY SAND, medium dense, moist **SM**			13.4
8	20	9 10 9 10	100		8									11.5
10					10									9.6
12														
14	15	9 9 7 8	95		13 15						SAME, gray, wet			18.6
16														
18	10	13 12 13 11	75		18 20									22.1
22											22.0 / 6.0 *ALLUVIUM,* Gray, SANDY LEAN CLAY, contains marine shell fragments, stiff, wet **CL**			
24	5	1 5 6 7	70		23 25						24.0 / 4.0 Gray, fine, SILTY SAND, medium dense, wet **SM**			20.1
26														
28	0	7 7 6 5	50		28 30									21.2

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-23

STATION: I-64WBL 134+00 OFFSET: 140' LT
LATITUDE: 36.832500° N LONGITUDE: 76.186667° W
SURFACE ELEVATION: 28.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/2/15 - 9/2/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32											32.0 / -4.0 Gray-tan, fine, POORLY GRADED SAND WITH SILT, dense, wet **SP-SM**			
	-5	15 14 16 14	50		33									
34					35									15.1
36														
38	-10	9 9 9 7	45		38						SAME, medium dense			
														19.5
40					40									
42											42.0 / -14.0 Gray, SANDY FAT CLAY, very soft, wet **CH**			
	-15	1 WOH 1 WOH	100		43									
44														45.5
					45									
46														
48	-20	WOH WOH WOH 1	100		48									
														48.0
50					50						Boring Terminated at 50' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-24

STATION: I-64WBL 136+00 OFFSET: 140' LT
LATITUDE: 36.832222° N LONGITUDE: 76.203056° W
SURFACE ELEVATION: 32.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/1/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		9 8 10	73		1.5						0.0 / 32.0 Asphalt 4" **ASPH**			10.2	
2	30	12 12 9 10	50		2						0.4 / 31.6 Gravel 5" **CRA**				
4		15 9 7 6	0		4						0.8 / 31.2 *FILL,* Orange-tan, fine, CLAYEY SAND, contains gravel, medium dense, moist **SC**			10.6	
6	25	9 6 5 5	100		6						6.0 / 26.0 *ALLUVIUM,* Gray, fine, SILTY SAND, medium dense, moist **SM**			12.0	
8		5 7 9 9	65		8						SAME, orange-tan			8.5	
10 ∇					10									12.0	
12	20	12 10 11 9	50		13						SAME, wet				
14					15									11.9	
16	15														
18		25 25 20 19	60		18						SAME, dense			12.5	
20					20										
22	10	15 17 22 24	60		23										
24					25								NP	11.2	25.0
26	5														
28		15 13 15 14	40		28						SAME, medium dense			14.1	
30					30										

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-24

STATION: I-64WBL 136+00 OFFSET: 140' LT
LATITUDE: 36.832222° N LONGITUDE: 76.203056° W
SURFACE ELEVATION: 32.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/1/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32	0														
		6 6 7 7	40		33–35									21.2	
34															
36	-5														
38		4 3 4 4	65		38–40						SAME, loose			22.6	
40															
42	-10														
		3 3 2 3	70		43–45								NP	27.9	16.9
44															
46	-15										47.0 / -15.0 Gray, fine to coarse, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**				
48		4 2 2 2	25		48–50								NP	16.4	7.1
50											Boring Terminated at 50' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-25

STATION: I-64WBL 138+00 OFFSET: 140' LT
LATITUDE: 36.940833° N LONGITUDE: 76.196667° W
SURFACE ELEVATION: 36.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/31/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	35	15 12 10	33		1.5						0.0 / 36.0 Asphalt 3" **ASPH**			9.9
2		12 13 13 14	90		2						0.3 / 35.7 Gravel 4" **CRA**			
4		13 9 11 15	100		4						0.6 / 35.4 *FILL,* Orange-gray, fine, SILTY SAND, contains gravel, medium dense, moist **SM**			10.9
6	30	18 12 14 13	75		6									12.2
8		10 17 17 16	100		8						SAME, dense			14.3
10					10									8.4
	25													
12											12.0 / 24.0 *ALLUVIUM,* Gray, fine, SILTY SAND, medium dense, wet **SM**			
14		14 11 10 12	65		13 15									16.4
16	20													
18		4 4 4 6	70		18						SAME, loose			13.7
20					20									
	15													
22														
24		13 12 20 24	65		23 25						SAME, dense			13.1
26	10													
28		15 17 22 27	55		28						SAME, contains marine shell fragments			13.2
30					30									
	5													

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-25

STATION: I-64WBL 138+00 OFFSET: 140' LT
LATITUDE: 36.940833° N LONGITUDE: 76.196667° W
SURFACE ELEVATION: 36.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/31/15 - 9/1/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32														
34		20 20 29 32	65		33–35									14.2
36	0													
38		17 16 18 17	60		38–40									20.1
40														
42	-5													
44		11 10 10 11	50		43–45						SAME, medium dense			19.5
46	-10													
48		5 4 3 3	50		48–50						SAME, loose			23.0
50											Boring Terminated at 50' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-26

STATION: I-64WBL 138+80 OFFSET: 140' LT
LATITUDE: 36.840979° N LONGITUDE: 76.196942° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		4 6 13 8	85						0.0 / 10.0 Topsoil 4" **TOPS**			6.0	
2		10 10 11 11	75	2					0.3 / 9.7 *FILL,* Tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			2.9	
4	5	11 10 8 9	75	4					3.3 / 6.7 *ALLUVIUM,* Gray mottled orange, fine, SILTY SAND, medium dense, moist **SM**			13.9	
6		10 5 5 5	55	6					5.8 / 4.2 Gray mottled orange, SANDY LEAN CLAY, stiff, moist **CL**			19.7	
8		4 3 4 3	75	8					SAME, firm			21.3	
10	0			10									
12													
14	-5	WOH WOH 1 1	100	13 15					12.0 / -2.0 Gray, FAT CLAY, very soft, wet **CH**	91	56	57.3	85.1
16													
18		WOH WOH WOH WOH	100	18					17.0 / -7.0 Gray-black, SANDY FAT CLAY, contains wood fragments and lenses of PEAT, very soft, wet **CH**			77.6	64.8
20	-10			20									
22													
24		2 5 4 6	100	23					23.5 / -13.5 Gray, fine, SILTY SAND, trace marine shell fragments, loose, wet **SM**			32.5	
26	-15			25									
28		WOH 1 1 1	100	28					28.5 / -18.5 Gray, SANDY LEAN CLAY, soft, wet **CL**	35	14	31.9	57.7
30	-20			30									

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-26

STATION: I-64WBL 138+80 OFFSET: 140' LT
LATITUDE: 36.840979° N LONGITUDE: 76.196942° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-25	WOH WOH WOH WOH	100		33–35						SAME, very soft			39.8	
36															
38	-30	WOH 2 1 1	75		38–40						SAME, soft			27.4	
42											42.0 / -32.0 Gray, fine, SILTY SAND, contains clay lenses, very loose, wet **SM**				
44	-35	1 1 1 2	90		43–45									31.5	
46															
48											47.0 / -37.0 Gray, SANDY FAT CLAY, very stiff, wet **CH**				
50	-40	WOH 6 10 5	75		48–50						49.3 / -39.3 Gray, fine, CLAYEY SAND, medium dense, wet **SC**			32.9	
52															
54	-45	9 8 7 16	100		53–55									28.1	
56															
58	-50	2 1 2 2	75		58–60						SAME, very loose	32	10	26.4	21.6
62															

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-26

STATION: I-64WBL 138+80 OFFSET: 140' LT
LATITUDE: 36.840979° N LONGITUDE: 76.196942° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
64	-55	WOH 5 13 16	100		63–65						SAME, medium dense			30.0	
68	-60	3 3 4 6	100		68–70						SAME, contains clay lenses, loose			40.7	
74	-65	3 3 6 5	50		73–75									33.8	
78	-70	3 3 6 5	90		78–80						SAME, loose	40	20	47.9	45.7
82											82.0 / -72.0 Gray, fine, SILTY SAND, medium dense, wet **SM**				
84	-75	4 5 8 10	70		83–85									30.9	
88	-80	8 8 9 12	65		88–90									31.0	
92											92.0 / -82.0				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-26

STATION: I-64WBL 138+80 OFFSET: 140' LT
LATITUDE: 36.840979° N LONGITUDE: 76.196942° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/26/15 - 8/26/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 10.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		3 3 2 5			93						Gray, FAT CLAY, firm, wet **CH**				
94			100									84	50	58.1	88.5
	-85				95										
96															
98		WOH 1 4 4			98										
			100											59.7	
100	-90				100						Boring Terminated at 100' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-27

STATION: I-64WBL 140+50 OFFSET: 190' LT
LATITUDE: 36.841317° N LONGITUDE: 76.197337° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/30/15 - 9/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		Hand Auger	100						0.0 / 10.0 *FILL,* Brown to orange, fine, SILTY SAND, contains gravel, moist **SM**			5.6	
2		Hand Auger	100	2					1.0 / 9.0 *ALLUVIUM,* Brown to orange-tan, fine, CLAYEY SAND, loose, moist **SC**			18.3	
4	5	2 3 5 3	100	4								18.1	48.4
6		2 3 5 5	50	6								14.3	
8		4 4 9 11	100	8					SAME, medium dense			18.5	
10	0			10					9.3 / 0.7 Orange-tan, fine, SILTY SAND, medium dense, moist **SM**				
12		4 1 5 5	55	13					12.0 / -2.0 Tan, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**				
14 ∇	-5			15								22.6	
16													
18		1 1 1 1	35	18					SAME, very loose		NP	28.0	13.5
20	-10			20					19.8 / -9.8 Gray, fine, SILTY SAND, very loose, wet **SM**				
22									22.0 / -12.0 Gray, SANDY FAT CLAY, very soft, wet **CH**				
24		WOH WOH 1 1	100	23								28.1	
26	-15			25					24.3 / -14.3 Gray, fine, SILTY SAND, contains clay lenses, very loose, wet **SM**				
28		1 1 1 1	85	28							NP	31.4	45.3
30	-20			30									

REMARKS: Rig Type: CME 55. Hand augered upper 4' due to potential utility conflicts.

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VDOT Virginia Department of Transportation	**PROJECT #:** 0264-122-108 (UPC57048) **LOCATION:** City of Norfolk **STRUCTURE:** SOUND BARRIER #1	**BH-27** **PAGE 2 OF 4**

STATION: I-64WBL 140+50 OFFSET: 190' LT
LATITUDE: 36.841317° N LONGITUDE: 76.197337° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/15 - 9/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
											32.0 / -22.0 Gray, FAT CLAY WITH SAND, very soft, wet **CH**				
34		WOH WOH 1 1	100		33									33.2	
	-25				35										
36															
38		2 1 2 1	0		38						SAME, soft				
40	-30				40										
42															
44		2 4 7 11	75		43						SAME, firm			28.0	
	-35				45						44.3 / -34.3 Gray, fine, SILTY SAND, medium dense, wet **SM**				
46															
48		1 1 1 1	15		48						47.0 / -37.0 Gray, SANDY LEAN CLAY, soft, wet **CL**	31	9	35.9	69.1
50	-40				50										
52															
54		1 1 1 3	100		53									30.4	
	-45				55						54.5 / -44.5 Gray, fine, CLAYEY SAND, very loose, wet **SC**				
56															
58		12 7 7 17	65		58						57.0 / -47.0 Gray, fine, SILTY SAND, medium dense, wet **SM**			26.8	
60	-50				60										
62															

REMARKS: Rig Type: CME 55. Hand augered upper 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-27

STATION: I-64WBL 140+50 OFFSET: 190' LT
LATITUDE: 36.841317° N LONGITUDE: 76.197337° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/15 - 9/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
64	-55	12 12 11 11	50		63–65									26.0	
66															
68		2 3 5 7	75		68–70						SAME, loose			35.5	19.8
70	-60										69.5 / -59.5 Gray, fine, CLAYEY SAND, loose, wet **SC**				
72															
74	-65	10 11 10 12	50		73–75						SAME, medium dense			23.8	
76															
78		7 4 4 5	50		78–80						SAME, loose			30.0	
80	-70														
82															
84	-75	4 5 11 10	65		83–85						SAME, medium dense			31.3	
86															
88		5 6 7 9	70		88–90									35.4	
90	-80														
92															

REMARKS: Rig Type: CME 55. Hand augered upper 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SOUND BARRIER #1

BH-27

STATION: I-64WBL 140+50 OFFSET: 190' LT
LATITUDE: 36.841317° N LONGITUDE: 76.197337° W
SURFACE ELEVATION: 10.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/30/15 - 9/30/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
94	-85	3 4 4 6	100		93 95						93.5 / -83.5 Gray, FAT CLAY WITH SAND, firm, wet **CH**			54.5	
96															
98		WOH WOH 1 3	100		98						SAME, very soft	80	51	59.7	82.7
100	-90				100						Boring Terminated at 100' Below Ground Surface				

REMARKS: Rig Type: CME 55. Hand augered upper 4' due to potential utility conflicts.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #6

BH-28

STATION: I-264EB 21+50 OFFSET: 100' RT
LATITUDE: 36.844294° N LONGITUDE: 76.195280° W
SURFACE ELEVATION: 19.0 ft COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/28/15 - 9/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.5 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 3 6 8	75								0.0 / 19.0 Topsoil 3" **TOPS**		NP	7.7	22.0
2		11 13 7 7	100		2						0.3 / 18.7 *ALLUVIUM,* Brown, fine, SILTY SAND, loose, moist **SM**				
4	15	5 7 6 8	100		4						2.0 / 17.0 Brown, fine, CLAYEY SAND, loose, moist **SC**			10.7	49.4
6		5 6 6 7	100		6						3.5 / 15.5 Orange-brown, LEAN CLAY, very stiff, moist **CL**			21.9	89.2
8		7 11 13 6	90		8						6.0 / 13.0 Orange-brown, fine, SILTY SAND, medium dense, moist **SM**			12.9	39.4
10	10				10								NP	6.5	17.8
12											12.0 / 7.0 Orange-tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**				
14	5	4 6 4 6	100		13 15								NP	21.3	8.1
											Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 55. Bulk sample collected from 4' to 8'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #6

BH-29

STATION: I-264EB 22+00 | OFFSET: 150' RT
LATITUDE: 36.844233° N | LONGITUDE: 76.194819° W
SURFACE ELEVATION: 18.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/15 - 9/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 3 10 6	75								0.0 / 18.0 Topsoil 6" **TOPS**			9.0	29.0
2	15	4 5 5 6	90		2						0.5 / 17.5 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, moist **SM**			20.6	88.2
4		6 6 6 6	90		4						2.0 / 16.0 Orange-brown, LEAN CLAY, firm, moist **CL**				
6		2 3 6 10	65		6						4.0 / 14.0 Orange-brown, fine, SILTY SAND, medium dense, moist **SM** SAME, loose		NP	10.6 9.1	32.9 20.0
8	10	5 5 8 8	90		8						7.5 / 10.5 Gray, fine to medium, POORLY GRADED SAND WITH SILT, loose, moist **SP-SM**		NP	6.4	9.7
10					10						SAME, tan, medium dense				
12															
14	5	4 4 11 9	100		13 15						SAME, fine		NP	19.4	7.8
											Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 55. Bulk sample collected from 4' to 8'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #6

BH-30

STATION: I-264EB 23+25 | OFFSET: 70' RT
LATITUDE: 36.854372° N | LONGITUDE: 76.194497° W
SURFACE ELEVATION: 18.0 ft | COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/28/15 - 9/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 9.25 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		1 2 5 5	65						0.0 / 18.0 Topsoil 3" **TOPS**			14.5	57.6
2	15	4 5 8 8	75	2					0.3 / 17.7 *ALLUVIUM,* Orange-brown, fine, SANDY LEAN CLAY, stiff, moist **CL**			20.8	81.9
4		8 8 10 8	85	4					SAME, very stiff			13.4	35.7
6		7 7 8 9	100	6					5.0 / 13.0 Orange-brown, fine, SILTY SAND, medium dense, moist **SM**		NP	11.2	14.4
8	10	4 6 6 7	100	8					SAME, wet		NP	16.4	12.2
10				10									
12													
14	5	3 6 10 8	100	13 15					14.5 / 3.5 Tan, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM** Boring Terminated at 15' Below Ground Surface		NP	22.5	8.0

REMARKS: Rig Type: CME 55. Bulk sample collected from 4' to 8'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #7

BH-31

STATION: Ramp D7CD 19+00 OFFSET: 100' RT
LATITUDE: 36.843328° N LONGITUDE: 76.194691° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		4 13 15 16	65						0.0 / 8.0 Topsoil 2" **TOPS**			6.3	52.0
2		14 12 11 7	40	2					0.2 / 7.8 *ALLUVIUM,* Dark brown, SANDY LEAN CLAY, very stiff, dry **CL**			8.3	54.3
4	5	13 8 5 5	75	4								39.0	42.2
6		2 2 2 1	75	6					5.0 / 3.0 Brown, fine, CLAYEY SAND, loose, moist **SC**			57.4	42.1
8	0	1 1 2 1	95	8					SAME, very loose	80	36	75.4	48.7
10				10									
12													
14	-5	1 2 3 3	70	13 15					14.2 / -6.2 Gray, fine, SILTY SAND, loose, wet **SM** Boring Terminated at 15' Below Ground Surface			27.0	24.1

REMARKS: Rig Type: CME 55. Bulk sample collected from 2' to 10'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #7

BH-32

STATION: Ramp D7 36+00 | OFFSET: 90' RT
LATITUDE: 36.843361° N | LONGITUDE: 76.194680° W
SURFACE ELEVATION: 8.0 ft | COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		6 11 14 15	75						0.0 / 8.0 Topsoil 2" **TOPS**			5.1	40.2
2		12 9 11 9	65	2					0.2 / 7.8 *ALLUVIUM,* Orange-tan, fine, CLAYEY SAND, medium dense, dry **SC**			6.9	40.1
4	5	8 6 6 5	35	4								6.4	47.2
6		4 2 2 2	90	6								90.2	61.1
8	0	3 5 4 2	90	8					7.0 / 1.0 Gray, SANDY LEAN CLAY, soft, moist **CL** SAME, stiff			117.6	77.4
10				10									
12													
▽	-5	2 4 2 3	65	13 15								20.1	59.9
14									Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 55. Bulk sample collected from 2' to 10'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: SWM #7

BH-33

STATION: Ramp D7 38+50 | OFFSET: 100' RT
LATITUDE: 36.843700° N | LONGITUDE: 76.194510° W
SURFACE ELEVATION: 8.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		4 7 13 13	95								0.0 / 8.0 Topsoil 2" **TOPS**			4.1	31.7
2		14 10 6 7	75		2						0.2 / 7.8 *ALLUVIUM,* Tan, fine, SILTY SAND, medium dense, dry **SM**		NP	13.7	30.4
4	5	7 4 3 2	100		4									50.1	42.1
6		2 1 1 1	75		6						6.0 / 2.0 Gray, SANDY LEAN CLAY, contains organics, soft, moist **CL**			136.0	52.1
8	0	1 2 2 1	75		8									162.6	63.1
10					10										
12											12.0 / -4.0 Gray, LEAN CLAY WITH SAND, soft, wet **CL**				
14	-5	WOH 2 2 2	50		13 15									26.2	80.7
											Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 55. Bulk sample collected from 2' to 10'.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: BC (7-1)

BH-34

STATION: Ramp D7 39+50 | OFFSET: 110' RT
LATITUDE: 36.843954° N | LONGITUDE: 76.194396° W
SURFACE ELEVATION: 8.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		7 19 23 18	100								0.0 / 8.0 Topsoil 3" **TOPS**			3.4	
2		12 7 10 8	75		2						0.3 / 7.7 *ALLUVIUM,* Tan to gray, fine, SILTY SAND, dense, dry **SM**				
	5										SAME, medium dense, moist			11.7	
4		7 4 4 3	100		4						SAME, loose			78.6	
6		2 1 1 1	100		6						5.5 / 2.5 Gray, SANDY LEAN CLAY, soft, moist **CL**			38.2	
8	0	WOH 1 1 2	100		8						7.5 / 0.5 Gray, fine, CLAYEY SAND, very loose, moist **SC**	209	91	151.0	13.2
10					10						9.0 / -1.0 Gray, ORGANIC CLAY, contains organics, soft, moist **OH**				
12															
	-5	WOH WOH 1 1	100		13 15						SAME, very soft			91.7	
14															
16															
18	-10	WOH 1 WOH 1	100		18									34.3	
20					20										
22															
	-15	1 1 2 1	85		23 25						22.0 / -14.0 Gray, fine, SILTY SAND, contains marine shell fragments, very loose, moist **SM**			29.8	
24															
26															
28	-20	WOH WOH WOH 3	100		28						27.0 / -19.0 Gray, FAT CLAY, very soft, wet **CH**			29.2	
30					30						29.8 / -21.8 Gray, fine, SILTY SAND, very loose, wet **SM**				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: BC (7-1)

BH-34

STATION: Ramp D7 39+50 | OFFSET: 110' RT
LATITUDE: 36.843954° N | LONGITUDE: 76.194396° W
SURFACE ELEVATION: 8.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: C. Young

GROUND WATER
FIRST ENCOUNTERED AT 13.0 ft DEPTH

FIELD DATA / **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-25	WOH WOH 2 2	100		33 35										
34											34.0 / -26.0 Gray, fine, CLAYEY SAND, contains organics, soft, wet **SC**	35	10	34.6	49.2
36															
38	-30	WOH 1 1 3	75		38 40						37.0 / -29.0 Gray, fine, SILTY SAND, contains clay lenses, very loose, wet **SM**			47.7	
40															
42															
	-35	5 4 5 9	75		43 45						SAME, loose			35.8	
44															
46															
48	-40	7 7 6 10	75		48 50						SAME, medium dense			31.1	
50											Boring Terminated at 50' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "N"

BH-35

STATION: Ramp D7 44+00 | OFFSET: 26' RT
LATITUDE: 36.845328° N | LONGITUDE: 76.192241° W
SURFACE ELEVATION: 24.0 ft | COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/15/15 - 9/15/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 23.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		24 18 11	80		1.5						0.0 / 24.0 Asphalt 4" **ASPH**			9.5
2		11 9			2						0.3 / 23.7 Gravel 6" **CRA**			
		9 18	70								0.8 / 23.2 *FILL,* Brown mottled orange, fine, SILTY SAND, contains gravel, dense, moist **SM**			3.6
4	20	7 13			4						3.0 / 21.0 Light tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			
		11 13	75											5.7
6		14 10			6									
		8 7	100											4.8
8		9 11			8									
	15	10 15	100											4.4
10					10									
12											12.0 / 12.0 *ALLUVIUM,* Orange-tan, SANDY LEAN CLAY, stiff, moist **CL**			
		3 5			13									
14	10	5 6	90		15						14.0 / 10.0 Orange-tan, fine, CLAYEY SAND, medium dense, moist **SC**			16.9
16														
18		5 7			18									
	5	10 10	75								18.75 / 5.25 Tan-orange, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			20.4
20					20									
22														
		8 5			23						SAME, tan to brown, wet			
24	0	8 8	60											23.3
					25						Boring Terminated at 25' Below Ground Surface			

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "N"

BH-36

STATION: Ramp D7 45+00 OFFSET: 26' RT
LATITUDE: 36.845246° N LONGITUDE: 76.192027° W
SURFACE ELEVATION: 25.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/16/15 - 9/16/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 23.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		12 19 13	80		1.5						0.0 / 25.0 Asphalt 4" **ASPH**			11.7	
2		14 10 11 10	75		2						0.3 / 24.7 Gravel 6" **CRA**				
4		16 17 20 14	65		4						0.8 / 24.2 *FILL,* Brown, coarse, SILTY SAND, contains gravel, dense, moist **FL**			5.0	
6	20	18 16 17 13	75		6						2.0 / 23.0 Light tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **FL**			7.8	
8		17 18 18 21	90		8						SAME, dense			7.1	
10	15				10								NP	6.1	9.1
12															
14		12 14 20 19	60		13									12.8	
16	10				15						14.5 / 10.5 *ALLUVIUM,* Tan-brown, fine, CLAYEY SAND, dense, moist **SC**				
18		6 6 7 9	75		18						14.75 / 10.25 Light tan, fine, POORLY GRADED SAND WITH SILT, dense, moist **SP-SM**				
20	5				20						17.0 / 8.0 Tan mottled orange, fine, SILTY SAND, medium dense, moist **SM**	22	NP	14.5	24.3
22															
24		5 4 2 3	75		23						SAME, loose, wet		NP	25.7	18.5
	0				25						Boring Terminated at 25' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "N"

BH-37

STATION: Ramp D7 46+00 OFFSET: 26' RT
LATITUDE: 36.845392° N LONGITUDE: 76.191692° W
SURFACE ELEVATION: 26.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/16/15 - 9/16/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 23.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	25	20 13 11	73		1.5 2						0.0 / 26.0 Asphalt 5" **ASPH** 0.4 / 25.6 Gravel 6" **CRA**			12.1
2		12 18 21 21	100		4						0.9 / 25.1 *FILL,* Brown, fine, SILTY SAND, contains gravel, dense, moist **SM**			8.9
4		20 18 17 21	100		6						4.0 / 22.0 *ALLUVIUM,* Tan mottled orange, fine, POORLY GRADED SAND WITH SILT, dense, moist **SP-SM**			5.7
6	20	8 19 25 21	100		8									6.4
8		21 20 26 29	100		10									7.6
10	15													
12					13									
14		18 25 22 26	65		15									8.5
16	10													
18		13 20 28 27	75		18 20									7.3
20	5													
22														
24		16 14 15 13	50		23 25						SAME, tan, medium dense, wet			19.4

Boring Terminated at 25' Below Ground Surface

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "O"

BH-38

STATION: Ramp D7 43+00 | OFFSET: 20' LT
LATITUDE: 36.845053° N | LONGITUDE: 76.192990° W
SURFACE ELEVATION: 25.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 9/27/15 - 9/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
									0.0 / 25.0 Asphalt 6" **ASPH**			8.0	
		16 14	47	1.5									
2		14 14		2					0.5 / 24.5 Concrete 6" **CONC**				
		20 20	75						1.0 / 24.0 Gravel 6" **CRA**			2.9	
4		14 16		4					1.5 / 23.5 *FILL,* Brown, fine, SILTY SAND, contains gravel, medium dense, moist **SM**				
	20	22 21	75									5.1	
6		20 22		6					SAME, dense				
		21 29	85						3.25 / 21.75 *ALLUVIUM,* Light tan, fine, POORLY GRADED SAND WITH SILT, dense, moist **SP-SM**		NP	4.6	10.1
8		18 23		8									
		27 30	85									5.0	
10	15			10									
12													
		9 10		13					SAME, medium dense				
14		13 11	50								NP	12.4	10.9
	10			15									
16													
18 ∇		7 5		18					SAME, wet				
		6 7	40									21.1	
20	5			20									
22													
		2 4		23					SAME, loose				
24		4 2	35								NP	23.5	6.7
	0			25									
									Boring Terminated at 25' Below Ground Surface				

REMARKS:

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "O"

BH-39

STATION: Ramp D7 44+00 | OFFSET: 20' LT
LATITUDE: 36.945312° N | LONGITUDE: 76.192406° W
SURFACE ELEVATION: 26.0 ft | COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/27/15 - 9/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
	25	14 8	100		1						0.0 / 26.0 Asphalt 6" **ASPH**			6.1
2		12 13			2						0.5 / 25.5 Concrete 6" **CONC**			
		14 13	75								1.0 / 25.0 Gravel 5" **CRA**			3.9
4		17 12			4						1.4 / 24.6 *FILL,* Light tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			
		14 15	90											4.0
6	20	19 16			6						SAME, dense			
		14 14	75											4.0
8		14 19			8									
		18 19	100											4.9
10					10									
	15													
12											12.0 / 14.0 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, moist **SM**			
		11 8			13									
14		5 4	40		15									16.3
16	10													
18 ∇		6 7			18									
		7 6	50											10.0
20					20									
	5													
22														
		6 9			23									
24		13 14	40											22.5
					25						Boring Terminated at 25' Below Ground Surface			

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "O"

BH-40

STATION: Ramp D7 45+00 OFFSET: 20' LT
LATITUDE: 36.845520° N LONGITUDE: 76.192058° W
SURFACE ELEVATION: 27.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/28/15 - 9/28/15
Drilling Method(s):
SPT Method:
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER

FIELD DATA											LAB DATA		
		SOIL				ROCK							
								DIP °					
DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	STRATA LEGEND	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
											LL	PI	

FIELD DESCRIPTION OF STRATA

DEPTH (ft)	ELEVATION (ft)
2	25
4	
6	
	20
8	
10	
12	15
14	
16	
	10
18	
20	
22	5
24	

Auger refusal. Unable to penetrate pavements and perform soil test boring.

REMARKS: Rig Type: CME 45. Auger refusal, unable to penetrate pavement due to subsurface obstruction.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "O"

BH-41

STATION: Ramp D7 46+00 | OFFSET: 20' LT
LATITUDE: 36.845453° N | LONGITUDE: 76.191517° W
SURFACE ELEVATION: 28.0 ft | COORD. DATUM: NAD 83

FIELD DATA

Date(s) Drilled: 9/28/15 - 9/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH

LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		16 12	80		1						0.0 / 28.0 Asphalt 6" **ASPH**			9.1
2		18 15			2						0.5 / 27.5 Concrete 6.5" **CONC**			
	25	17 17	80								1.0 / 27.0 Gravel 3" **CRA**			7.0
4		14 13			4						1.3 / 26.7 *FILL,* Brown mottled orange, fine, SILTY SAND, contains gravel, medium dense, moist **SM**			8.0
		14 16	100											
6		13 18			6						2.0 / 26.0 Light tan, fine, POORLY GRADED SAND WITH SILT, dense, moist **SP-SM**			8.2
		20 26	100											
8	20	22 23			8						SAME, medium dense			
		23 29	90								SAME, dense			6.6
10					10						9.5 / 18.5 *ALLUVIUM,* Orange-brown, SILTY SAND, contains clay lenses, dense, moist **SM**			
12											12.0 / 16.0 Tan, fine, POORLY GRADED SAND WITH SILT, dense, moist **SP-SM**			
	15	16 22			13									
14		26 26	50		15									10.8
16														
18 ∇	10	13 23			18						SAME, very dense			
		39 34	50											12.9
20					20									
22														
	5	19 23			23						SAME, dense, wet			
24		23 24	60											11.6
					25						Boring Terminated at 25' Below Ground Surface			

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 84"X96" BC (7-15)

BH-42

STATION: I-264EB CD 32+00 OFFSET: 90' RT
LATITUDE: 36.844945° N LONGITUDE: 76.191621° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 5.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		WOH 1 1	13		1.5						0.0 / 8.0 Asphalt 3" **ASPH**			13.4	
2		WOH WOH			2						0.4 / 7.6 Gravel 5" **CRA**				
	5	1 2	40								0.7 / 7.3 *FILL,* Gray, fine, SILTY SAND, contains gravel, very loose, wet **SM**			21.6	
4		WOH WOH			4										
▽		WOH 2	100								3.8 / 4.2 *ALLUVIUM,* Gray, SANDY LEAN CLAY, very soft, wet **CL**			58.1	
6		1 2 1	100		6						5.5 / 2.5 Brown, CLAYEY SAND, contains organics, very loose, wet **SC**			71.2	
8	0	1 WOH 1			8							33	11	39.6	37.8
		2	75												
10					10						9.5 / -1.5 Tan, fine, SILTY SAND, very loose, wet **SM**				
12															
	-5	5 6			13						SAME, medium dense				
14		11 12	75		15									23.5	
16															
18	-10	3 2 1	85		18						SAME, gray, contains marine shell fragments, very loose			28.2	
20		2			20										
22											22.0 / -14.0 Black, PEAT, soft, wet **PT**				
	-15	1 1			23										
24		1 1	50								24.0 / -16.0 Gray, SANDY LEAN CLAY, soft, wet **CL**	34	17	29.2	69.8
					25										
26															
28	-20	1 1 7	75		28						27.0 / -19.0 Gray, fine, SILTY SAND, loose, wet **SM**			30.1	
30		8			30						Boring Terminated at 30' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 84"X96" BC (7-15)

BH-43

STATION: I-264EB CD 33+75 OFFSET: 20' RT
LATITUDE: 36.845058° N LONGITUDE: 76.191167° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 8/27/15 - 8/27/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 7.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		5 10 7 9	65						0.0 / 8.0 Topsoil 3" **TOPS**			2.9	
2	5	9 7 5 6	40	2					0.3 / 7.7 *FILL,* Tan mottled orange, fine, SILTY SAND, contains gravel, medium dense, dry **SM**			5.0	
4		5 5 4 6	65	4					4.8 / 3.2 *ALLUVIUM,* Brown-gray, fine, CLAYEY SAND, loose, moist **SC**			15.1	
6		4 3 2 1	75	6					6.8 / 1.2 Gray, SANDY LEAN CLAY, firm, wet **CL**			37.0	
8	0	2 1 2 2	75	8					SAME, soft	65	30	51.4	66.3
10				10					9.5 / -1.5 Black, SANDY ELASTIC SILT, contains PEAT, soft, wet **MH**				
12													
14	-5	4 4 3 6	100	13 15					13.5 / -5.5 Brown, fine, SILTY SAND, loose, wet **SM**			25.0	
16													
18	-10	3 3 4 5	70	18					SAME, gray, contains marine shell fragments			24.5	
20				20									
22													
24	-15	WOH 1 1 1	100	23 25					22.0 / -14.0 Gray, SANDY FAT CLAY, soft, wet **CH**	64	37	50.1	79.4
26													
28	-20	1 1 2 1	100	28					27.0 / -19.0 Gray, fine, CLAYEY SAND, very loose, wet **SC**			26.3	
30				30					Boring Terminated at 30' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8-34)

BH-44

STATION: I-264EB CD 40+00 OFFSET: 5' RT
LATITUDE: 36.845225° N LONGITUDE: 76.188938° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/21/15 - 9/21/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		8 9 8 5	75		2						0.0 / 8.0 Topsoil 5" **TOPS**			4.9	
2	5	6 5 8 8	75		4						0.42 / 7.58 *FILL,* DEBRIS FILL, contains asphalt and rock fragments **FL**			7.1	
4		10 7 6 5	75		6						1.5 / 6.5 Brown, SILTY SAND, contains gravel, medium dense, moist **SM**			6.7	
6		4 4 3 3	75		8						2.5 / 5.5 *ALLUVIUM,* Tan, fine CLAYEY SAND, medium dense, moist **SC**			16.5	
8	0	4 4 2 2	75		10						6.0 / 2.0 Brown mottled orange, SANDY LEAN CLAY, firm, moist **CL**			28.6	
10											7.25 / 0.75 Black, ORGANIC CLAY, firm, moist **OL/OH** SAME, contains wood fragments				
12	-5	4 5 8 9	70		13 15						12.0 / -4.0 Tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			22.0	
14															
16															
18	-10	7 5 6 6	50		18 20						SAME, gray, wet			21.8	
20															
22	-15	2 2 2 1	95		23 25						22.0 / -14.0 Gray, fine, SILTY SAND, contains marine shell fragments, loose, wet **SM**			26.6	
24															
26															
28	-20	1 0 2 2	85		28 30						28.5 / -20.5 Gray, ORGANIC CLAY, soft, wet **OH**	204	55	114.6	26.5
30											29.25 / -21.25 Brown, PEAT, contains wood fragments, soft, wet **PT**				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8-34)

BH-44

STATION: I-264EB CD 40+00 OFFSET: 5' RT
LATITUDE: 36.845225° N LONGITUDE: 76.188938° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/21/15 - 9/21/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 14.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-25	WOH WOH WOH WOH	100		33 35						32.0 / -24.0 Gray, fine, SILT WITH SAND, very soft, wet **ML**	35	10	35.1	71.3
34															
36															
38	-30	9 9 12 10	70		38 40						37.0 / -29.0 Gray, fine, SILTY SAND, medium dense, wet **SM**			29.4	
40											Boring Terminated at 40' Below Ground Surface				

REMARKS: Rig Type: CME 55.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 108"X96"BC

BH-45

STATION: Ramp D7CD 17+25 OFFSET: 30' RT
LATITUDE: 36.843177° N LONGITUDE: 76.194853° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/9/15 - 10/9/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		1 3 1 3	90								0.0 / 8.0 Topsoil 8" **TOPS**			
2		1 1 2 1			2						0.7 / 7.3 *ALLUVIUM,* Gray, fine, CLAYEY SAND, loose, moist **SC**			
	5		100								2.0 / 6.0 Brown-tan, fine, POORLY GRADED SAND WITH SILT, very loose, moist **SP-SM**			
4		WOH WOH WOH WOH			4									
6 ▽		WOH WOH 1 0	100		6						5.0 / 3.0 Dark gray, ORGANIC CLAY, contains wood fragments, very soft, wet **OH**			
8	0	WOH WOH WOH WOH	100		8									
10					10									
12											12.0 / -4.0 Gray, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**			
	-5	1 1 5 3	75		13									
14					15									
16														
18	-10	4 2 2 8	50		18									
20					20									
22											22.0 / -14.0 Gray, FAT CLAY, very soft, wet **CH**			
	-15	WOH WOH WOH WOH	100		23									
24					25									
26														
28	-20	1 0 1 0	100		28									
30					30									

REMARKS: Rig Type: CME 55.

SPT_LOG:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 108"X96"BC

BH-45

STATION: Ramp D7CD 17+25 OFFSET: 30' RT
LATITUDE: 36.843177° N LONGITUDE: 76.194853° W
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/9/15 - 10/9/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
32														
	-25	WOH WOH WOH WOH	100		33 35									
34														
36														
											37.0 / -29.0 Gray, fine, SILTY SAND, very loose, wet **SM**			
38	-30	1 1 1 1	100		38 40									
40														
42														
	-35	5 7 7 8	100		43 45						SAME, medium dense			
44														
											Boring Terminated at 45' Below Ground Surface			

REMARKS: Rig Type: CME 55.

SPT_LOG:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-5)

BH-46

STATION: D7 Conn 305+25 | OFFSET: 50' RT
LATITUDE: 36.845511° N | LONGITUDE: 76.188615° W
SURFACE ELEVATION: 20.0 ft | COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/15 - 9/29/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		WOH 2 4 4	75								0.0 / 20.0 Topsoil 3" **TOPS**			11.0	
2		5 7 8 7	75		2						0.3 / 19.7 *FILL,* Brown, fine, SILTY SAND, contains roots, loose, moist **SM**				
											SAME, medium dense			9.1	
4		5 7 8 10	100		4						3.5 / 16.5 Asphalt 3" **ASPH**			12.7	
6	15	10 9 10 12	95		6						3.8 / 16.2 *ALLUVIUM,* Brown, fine, SILTY SAND, medium dense, moist **SM**				
											SAME, gray, contains marine shell fragments			12.5	
8		12 15 17 23	100		8						SAME, dense			12.1	
10	10				10										
12															
		1 2 4 5	40		13						SAME, loose, wet				
14														17.5	
	5				15										
16															
18		2 5 5 7	65		18						17.0 / 3.0 Gray, SANDY LEAN CLAY, stiff, wet **CL**			17.2	
20	0				20						19.3 / 0.7 Gray, fine, POORLY GRADED SAND WITH SILT, contains clay lenses, medium dense, wet **SP-SM**				
22															
		10 10 13 13	50		23										
24														21.9	
	-5				25										
26															
28		9 12 11 10	40		28						27.0 / -7.0 Gray, fine, SILTY SAND, medium dense, wet **SM**			22.5	
30	-10				30										

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-5)

BH-46

STATION: D7 Conn 305+25 OFFSET: 50' RT
LATITUDE: 36.845511° N LONGITUDE: 76.188615° W
SURFACE ELEVATION: 20.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/29/15 - 9/29/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 18.0 ft DEPTH

FIELD DATA											LAB DATA			
DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
34	-15	3 1 1 2	60		33 35						SAME, contains marine shell fragments, very loose		NP	26.6	15.8
36															
38		WOH 1 1 2	65		38						37.0 / -17.0 Gray, ORGANIC CLAY, contains interbedded PEAT, soft, wet **OH**	33	15	30.9	69.2
40	-20				40						39.3 / -19.3 Gray, SANDY LEAN CLAY, soft, wet **CL** Boring Terminated at 40' Below Ground Surface				

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-4)

BH-47

STATION: D7 Conn 307+75 OFFSET: 45' RT
LATITUDE: 36.845467° N LONGITUDE: 76.186902° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 3.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		WOH 1 2 3	75								0.0 / 13.0 Topsoil 4" **TOPS**			18.0	51.6
2		4 3 4 8			2						0.3 / 12.7 *ALLUVIUM,* Brown, SANDY LEAN CLAY, firm, moist **CL**				
	10		100											20.9	
4		4 2 1 1			4						3.5 / 9.5 Gray, fine, SILTY SAND, very loose, wet **SM**				
			90											21.4	
6		1 2 5 7			6						SAME, loose				
			100											21.6	
8	5	6 10 14 13			8						SAME, medium dense				
			100											19.2	
10					10										
12															
	0	6 7 9 7			13										
14			65											21.6	
					15										
16															
18	-5	3 2 2 2			18						SAME, gray, contains marine shell fragments, loose				
			75											22.9	
20					20										
22											22.0 / -9.0 Brown, PEAT, very soft, wet **PT**				
	-10	WOH WOH WOH WOH			23										
24			50								24.0 / -11.0 Gray, FAT CLAY WITH SAND, very soft, wet **CH**			39.3	
					25										
26															
28	-15	2 1 1 2			28						27.0 / -14.0 Gray, fine, SILTY SAND, contains clay lenses, very loose, wet **SM**				
			65											39.3	
30					30										

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-4)

BH-47

STATION: D7 Conn 307+75 OFFSET: 45' RT
LATITUDE: 36.845467° N LONGITUDE: 76.186902° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 3.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-20	1 1 1 1	25		33 35						32.0 / -19.0 Gray, LEAN CLAY WITH SAND, soft, wet **CL**			58.2	72.8
34															
36															
38	-25	WOH WOH 1 1	50		38 40						SAME, very soft			46.6	
40											Boring Terminated at 40' Below Ground Surface				

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-3)

BH-48

STATION: D7 Conn 310+00 OFFSET: 60' RT
LATITUDE: 36.845404° N LONGITUDE: 76.186179° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 7.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		WOH 1 1 3	100								0.0 / 13.0 Topsoil 2" **TOPS**			37.9
2		6 10 10 13	100		2						0.2 / 12.8 *ALLUVIUM,* Tan mottled orange, fine, SILTY SAND, medium dense, moist **SM**			7.6
4	10	6 10 10 11	90		4									16.2
6		2 1 1 1	100		6						SAME, very loose, wet			26.5
8	5	1 1 1 4	100		8						7.3 / 5.7 Brown, fine, CLAYEY SAND, trace marine shell fragments, very loose, wet **SC**			28.1
10					10									
12														
	0	4 4 6 8	65		13						12.0 / 1.0 Gray, fine, POORLY GRADED SAND WITH SILT, trace marine shell fragments, medium dense, wet **SP-SM**			
14					15									23.1
16														
18	-5	6 7 5 3	40		18									24.4
20					20						19.5 / -6.5 Gray, fine, SILTY SAND, very loose, wet **SM**			
22														
	-10	1 1 1 0	100		23									
24					25						24.5 / -11.5 Gray, SANDY FAT CLAY, very soft, wet **CH**			32.5
26														
28	-15	WOH WOH 1 1	90		28									26.4
30					30									

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-3)

BH-48

STATION: D7 Conn 310+00 OFFSET: 60' RT
LATITUDE: 36.845404° N LONGITUDE: 76.186179° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 7.0 ft DEPTH

FIELD DATA												LAB DATA		
		SOIL				ROCK								
DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)
32														
	-20	1 1 1 1	100		33 35						SAME, soft			39.9
34														
36														
38	-25	1 0 1 1	100		38 40						SAME, very soft			54.2
40											Boring Terminated at 40' Below Ground Surface			

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-2)

BH-49

STATION: D7 Conn 312+00 OFFSET: 175' RT
LATITUDE: 36.845237° N LONGITUDE: 76.185711° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 4.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		WOH 3 10 7	85								0.0 / 13.0 Topsoil 5" **TOPS**			9.9	
2	10	7 11 11 9	80		2						0.5 / 12.5 *ALLUVIUM,* Orange-tan, fine, SILTY SAND, medium dense, moist **SM**			11.1	
4 ∇		8 9 10 9	95		4						SAME, orange-brown, wet			22.5	
6		7 5 3 2	100		6						SAME, loose			21.3	
8	5	WOH 1 2 2	100		8						SAME, very loose			25.2	22.8
10					10										
12											12.0 / 1.0 Gray, fine, POORLY GRADED SAND WITH SILT, contains marine shell fragments, medium dense, wet **SP-SM**				
14	0	4 6 7 7	55		13 15									24.4	
16															
18	-5	7 7 4 4	40		18									24.7	
20					20										
22															
24	-10	2 1 1 1	60		23 25						24.5 / -11.5 Gray, fine, CLAYEY SAND, very loose, wet **SC**			29.1	
26															
28	-15	WOH WOH WOH WOH	0		28										
30					30										

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: 96"X96" BC (8E-2)

BH-49

STATION: D7 Conn 312+00 OFFSET: 175' RT
LATITUDE: 36.845237° N LONGITUDE: 76.185711° W
SURFACE ELEVATION: 13.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/5/15 - 10/5/15
Drilling Method(s): Mod Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 4.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
32															
	-20	WOH WOH 4 6	100		33 35						32.0 / -19.0 Gray, SANDY FAT CLAY, soft, wet **CH**			36.3	
34															
36															
38	-25	1 1 1 4	85		38 40									38.3	46.1
40											Boring Terminated at 40' Below Ground Surface				

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "Q"

BH-50

STATION: I-264EB CD 42+25 OFFSET: 25' RT
LATITUDE: 36.845351° N LONGITUDE: 76.188425° W
SURFACE ELEVATION: 15.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/21/15 - 9/21/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 9.75 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		8 15 12 8	75						0.0 / 15.0 Topsoil 2" **TOPS**			20.3	
2		10 14 14 13	75	2					0.2 / 14.8 *ALLUVIUM,* Tan mottled orange, LEAN CLAY WITH SAND, very stiff, dry **CL** SAME, moist	39	18	12.1	83.3
4		10 9 7 5	95	4					4.0 / 11.0 Orange-tan, fine to medium, SILTY SAND, medium dense, moist **SM**		NP	3.9	14.2
6	10	7 7 7 7	75	6					5.5 / 9.5 Orange-tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			3.9	
8		6 8 7 7	75	8								8.1	
10	5			10									
12													
14		5 6 9 10	65	13 15					SAME, gray, wet			22.5	
16	0												
18		6 7 8 8	50	18					SAME, contains marine shell fragments			22.2	
20	-5			20									
22													
24		2 1 2 2	85	23 25					SAME, very loose		NP	26.0	8.6
26	-10												
28		5 2 2 1	100	28					SAME, loose			22.7	
30	-15			30					Boring Terminated at 30' Below Ground Surface				

REMARKS: Rig Type: CME 45.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "Q"

BH-51

STATION: Ramp A 10+15 OFFSET: 10' RT
LATITUDE: 36.845047° N LONGITUDE: 76.187791° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/21/15 - 9/21/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 8.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	SOIL: STANDARD PENETRATION TEST HAMMER BLOWS	SOIL: SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	ROCK: CORE RECOVERY (%)	ROCK: ROCK QUALITY DESIGNATION	ROCK: DIP ° STRATA	ROCK: DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
		6 5 6	67		1.5 2						0.0 / 12.0 Asphalt 2" **ASPH**			13.9
2	10	7 6 10 9	75		4						0.2 / 11.8 Gravel 4" **CRA**			
4		12 10 11 10	60		6						0.5 / 11.5 *ALLUVIUM,* Brown, SANDY LEAN CLAY, stiff, moist **CL**			10.7
6	5	6 5 6 6	70		8						SAME, very stiff			
8 ▽		1 6 9 6	85		10						4.0 / 8.0 Orange-tan, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM**			3.7
10														11.7
12	0				13						SAME, wet			24.1
14		9 10 11 9	75		15									24.1
16	-5													
18		2 4 8 10	60		18 20						SAME, gray, contains marine shell fragments			23.1
20														
22	-10										22.0 / -10.0 Gray, fine, SILTY SAND, contains marine shell fragments, very loose, wet **SM**			
24		2 1 1 2	95		23 25									27.9
26	-15													
28		2 1 1 1	95		28 30									32.2
30											Boring Terminated at 30' Below Ground Surface			

REMARKS: Rig Type: CME 45.

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PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: RETAINING WALL "Q"

BH-52

STATION: Ramp A 11+20 OFFSET: 10' RT
LATITUDE: 36.845333° N LONGITUDE: 76.187653° W
SURFACE ELEVATION: 12.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 9/21/15 - 9/21/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 5.5 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		3 4 5 5	75								0.0 / 12.0 Topsoil 2" **TOPS**			2.9	
2	10	7 7 7 7	95		2						0.2 / 11.8 *FILL,* Tan, fine, SILTY SAND, trace gravel, loose, moist **SM**			13.6	
4		7 4 4 5	95		4						2.0 / 10.0 *ALLUVIUM,* Tan to brown, fine, POORLY GRADED SAND WITH SILT, medium dense, moist **SP-SM** SAME, loose, wet			20.6	
6	5	2 1 1 2	100		6						SAME, very loose		NP	22.7	11.7
8		6 5 6 6	100		8						SAME, medium dense			19.7	
10					10										
12	0														
14		5 6 7 11	70		13 15						13.0 / -1.0 Gray, fine, SILTY SAND, contains marine shell fragments, medium dense, wet **SM**			24.0	
16	-5	6 7 5 6	50		16 18						SAME, very loose			24.7	
18															
20															
22	-10														
24		2 1 1 2	100		23 25								NP	30.2	26.6
26															
28	-15	WOH WOH 1 1	100		28 30						27.0 / -15.0 Gray, SANDY LEAN CLAY, very soft, wet **CL**	26	9	24.3	61.4
30											Boring Terminated at 30' Below Ground Surface				

REMARKS: Rig Type: CME 45.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: POND 8I

BH-53

STATION:
LATITUDE: 36.845031° N
SURFACE ELEVATION: 12.0 ft

OFFSET:
LONGITUDE: 76.183185° W
COORD. DATUM: NAD 83

Date(s) Drilled: 8/28/15 - 8/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		2 10 8 10	65								0.0 / 12.0 Topsoil 5" **TOPS**	33	15	6.0	55.1
2	10	4 9 15 10	75		2						0.5 / 11.5 *ALLUVIUM,* Gray, SANDY LEAN CLAY, firm, moist **CL**	28	15	11.5	37.4
4		9 9 7 7	100		4						3.0 / 9.0 Brown, fine, CLAYEY SAND, medium dense, moist **SC**		NP	10.7	10.1
6 ∇	5	2 1 2 2	100		6						5.0 / 7.0 Gray, fine, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**		NP	18.0	8.3
8		2 2 2 2	100		8						8.0 / 4.0 Gray, fine, SILTY SAND, very loose, wet **SM**		NP	35.0	13.8
10					10										
12	0				13						12.0 / 0.0 Gray, fine, POORLY GRADED SAND WITH SILT, contains marine shell fragments, medium dense, wet **SP-SM**		NP	23.9	5.8
14		3 5 15 15	100		15						Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 45. Bulk sample collected from 2' to 8'.

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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: POND 8I

BH-54

STATION:
LATITUDE: 36.844631° N
SURFACE ELEVATION: 12.0 ft

OFFSET:
LONGITUDE: 76.182125° W
COORD. DATUM: NAD 83

Date(s) Drilled: 8/28/15 - 8/28/15
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: R. Williams

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA / LAB DATA

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)	FINES CONTENT -#200 (%)
		5 10 9 10	95						0.0 / 12.0 Topsoil 4" **TOPS**	22	7	8.7	68.3
2	10	8 9 10 9	75	2					0.3 / 11.7 *ALLUVIUM,* Gray, SANDY LEAN CLAY, firm, moist **CL**			9.4	47.6
4		16 9 10 10	50	4					4.0 / 8.0 Gray-brown, fine, CLAYEY SAND, medium dense, moist **SC**	24	6	15.5	12.0
6 ▽	5	13 8 6 3	100	6					5.0 / 7.0 Gray, fine, POORLY GRADED SAND WITH CLAY, medium dense, wet **SP-SM**		NP	17.6	8.5
8		2 2 1 2	100	8					7.0 / 5.0 Gray, fine, SILTY SAND, contains marine shell fragments, medium dense, wet **SM**		NP	23.5	13.8
10				10					9.0 / 3.0 Gray, fine to coarse, POORLY GRADED SAND WITH SILT, medium dense, wet **SP-SM**				
12	0												
		5 4 7 8	0	13 15							NP	20.2	10.0
									Boring Terminated at 15' Below Ground Surface				

REMARKS: Rig Type: CME 45. Bulk sample collected from 2' to 8'.

SPT_LOGB:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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Virginia Department of Transportation

PROJECT #: 0264-122-108 (UPC57048)
LOCATION: City of Norfolk
STRUCTURE: DBL 108"X96"BC

BH-55

STATION: Ramp D7CD 25+50 OFFSET: 15' RT
LATITUDE: 36.844851° N LONGITUDE: 76192138.000000°
SURFACE ELEVATION: 8.0 ft COORD. DATUM: NAD 83

Date(s) Drilled: 10/9/2015 - 10/9/2015
Drilling Method(s): Mud Rotary
SPT Method: Automatic Hammer
Other Test(s):
Driller: Fishburne Drilling
Logger: D. Anderson

GROUND WATER
FIRST ENCOUNTERED AT 6.0 ft DEPTH

FIELD DATA | **LAB DATA**

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS (SOIL)	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%) (ROCK)	ROCK QUALITY DESIGNATION	DIP ° STRATA	DIP ° JOINTS	STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LIQUID LIMIT (LL)	PLASTICITY INDEX (PI)	MOISTURE CONTENT (%)
2, 4	5	2 2 1 2 / 2 2 2 2 / 2 2 2 2	60, 40		2, 4						0.0 / 8.0 *ALLUVIUM,* Brown-gray, fine, CLAYEY SAND, contains organics, very loose, moist **SC**; SAME, loose			
6	0	1 1 1 0 / 1 1 1 1	75, 45, 50		6, 8, 10						5.0 / 3.0 Brown, SANDY FAT CLAY, contains organics, soft, wet **CH**			
12, 14	-5	2 2 6 5	55		13, 15						8.0 / 0.0 Gray-brown, fine, SILTY SAND, very loose, wet **SM**; 12.0 / -4.0 Gray, fine, POORLY GRADED SAND WITH SILT, loose, wet **SP-SM**			
18, 20	-10	1 1 0 0	100		18, 20						19.0 / -11.0 Gray, fine, CLAYEY SAND, contains clay lenses, very loose, wet **SC**			
24	-15	1 1 1 2	100		23, 25									
28, 30	-20	4 4 9 6	100		28, 30						SAME, medium dense; Boring Terminated at 30' Below Ground Surface			

REMARKS: Rig Type: CME 45.

SPT_LOG:04-9663O UPC57048.GPJ:8.30.002:021011:10/13/15

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Enclosure 3

Laboratory Test Results

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-01												
	S-1	0.00 - 2.00	12.3	CL	31	16	15	67.1				
	S-2	2.00 - 4.00	15.4	CL	32	15	17	57.8				
	S-3	4.00 - 6.00	15.6	SM	NP	NP	NP	42.5				
	S-4	6.00 - 8.00	18.9	SM	NP	NP	NP	27.7				
	S-5	8.00 - 10.00	19.4	SM	NP	NP	NP	25.3				
	S-6	13.00 - 15.00	14.7	SP-SM	NP	NP	NP	5.1				
BH-02												
	S-1	0.00 - 2.00	19.1									
	S-2	2.00 - 4.00	9.5	SM	NP	NP	NP	27.4				
	S-3	4.00 - 6.00	17.6									
	S-4	6.00 - 8.00	15.7	SM	NP	NP	NP	16.8				
	S-5	8.00 - 10.00	20.0									
	S-6	13.00 - 15.00	23.6									
	S-7	18.00 - 20.00	29.9									
	S-8	23.00 - 25.00	38.9	SC	33	24	9	48.5				
	S-9	28.00 - 30.00	43.5									
	S-10	33.00 - 35.00	37.8	CL	35	22	13	79.4				
	S-11	38.00 - 40.00	41.5									
	S-12	43.00 - 45.00	42.6	CH	57	19	38	95.4				
	S-13	48.00 - 50.00	43.0									
	S-14	53.00 - 55.00	57.9	CH	64	23	41	96.0				
	S-15	58.00 - 60.00	35.5	SC	25	17	8	33.1				
	S-16	63.00 - 65.00	46.2									
	S-17	68.00 - 70.00	27.7									
	S-18	73.00 - 75.00	35.3									
	S-19	78.00 - 80.00	62.2	CH	66	27	39	91.0				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-03												
	S-1	0.00 - 2.00	18.1									
	S-2	2.00 - 4.00	26.8	CL	36	19	17	93.3				
	S-3	4.00 - 6.00	8.0									
	S-4	6.00 - 8.00	23.4									
	S-5	8.00 - 10.00	31.7									
	S-6	13.00 - 15.00	20.1									
	S-7	18.00 - 20.00	31.8	SM	NP	NP	NP	17.4				
	S-8	23.00 - 25.00	51.5	CL	48	22	26	62.2				
	S-9	28.00 - 30.00	40.5									
	S-10	33.00 - 35.00	40.2	CL	41	24	17	78.6				
	S-11	38.00 - 40.00	49.7									
	S-12	43.00 - 45.00	45.8									
	S-13	48.00 - 50.00	41.8	CL	47	18	29	79.1				
	S-14	53.00 - 55.00	50.2									
	S-15	58.00 - 60.00	56.7	CL	48	20	28	71.2				
	S-16	63.00 - 65.00	55.3	CH	51	21	30	74.2				
	S-17	68.00 - 70.00	50.8									
	S-18	73.00 - 75.00	52.2	CH	53	23	30	66.2				
	S-19	78.00 - 80.00	52.8									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Friday, October 02, 2015

ECS MID-ATLANTIC, LLC
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Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-04												
	S-1	0.00 - 2.00	9.0									
	S-2	2.00 - 4.00	15.1	SC	34	15	19	49.3				
	S-3	4.00 - 6.00	20.0									
	S-4	6.00 - 8.00	31.1	CL	35	22	13	68.2				
	S-5	8.00 - 10.00	15.0									
	S-6	13.00 - 15.00	22.1									
	S-7	18.00 - 20.00	24.0	SM	NP	NP	NP	12.3				
	S-8	23.00 - 25.00	46.2	CH	53	24	29	61.1				
	S-9	28.00 - 30.00	44.7									
	S-10	33.00 - 35.00	46.2									
	S-12	38.00 - 40.00	40.1	CL	44	24	20	85.2				
	S-13	43.00 - 45.00	39.4									
	S-14	48.00 - 50.00	42.9	CL	47	19	28	91.7				
	S-15	53.00 - 55.00	51.0									
	S-16	58.00 - 60.00	53.2	CH	63	23	40	77.6				
	S-17	63.00 - 65.00	49.6									
	S-18	68.00 - 70.00	37.0	SC	31	20	11	28.0				
	S-19	73.00 - 75.00	36.4									
	S-20	78.00 - 80.00	47.6									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

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Printed On: Friday, October 02, 2015

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Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-05												
	S-1	0.00 - 2.00	10.4									
	S-2	2.00 - 4.00	12.0									
	S-3	4.00 - 6.00	17.6									
	S-4	6.00 - 8.00	27.2	CH	50	23	27	86.8				
	S-5	8.00 - 10.00	29.9	CL	43	17	26	72.8				
	S-6	13.00 - 15.00	21.9									
	S-7	18.00 - 20.00	22.7									
	S-8	23.00 - 25.00	22.6									
	S-9	28.00 - 30.00	29.1									
	S-10	33.00 - 35.00	35.6	SC	37	23	14	49.7				
	S-11	38.00 - 40.00	41.1	CL	41	25	16	81.8				
	S-12	43.00 - 45.00	41.7									
	S-13	48.00 - 50.00	45.5	CL	49	27	22	93.7				
	S-14	53.00 - 55.00	54.0									
	S-15	58.00 - 60.00	56.4	CH	52	22	30	62.6				
	S-16	63.00 - 65.00	38.6	SC	31	18	13	40.8				
	S-17	68.00 - 70.00	32.8									
	S-18	73.00 - 75.00	32.9									
	S-19	78.00 - 80.00	41.4	SC	36	15	21	39.1				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

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Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-06												
	S-1	0.00 - 2.00	9.4									
	S-2	2.00 - 4.00	6.6									
	S-3	4.00 - 6.00	24.0	SC-SM	20	15	5	40.9				
	S-4	6.00 - 8.00	19.5	SP-SM	NP	NP	NP	10.1				
	S-5	8.00 - 10.00	21.4									
	S-6	13.00 - 15.00	23.3									
	S-7	18.00 - 20.00	19.2	SP-SM	NP	NP	NP	6.0				
	S-8	23.00 - 25.00	22.4									
	S-9	28.00 - 30.00	26.2									
	S-10	33.00 - 35.00	24.2	SP-SM	NP	NP	NP	7.5				
	S-11	38.00 - 40.00	20.8									
	S-12	43.00 - 45.00	39.4	CL	41	23	18	81.4				
	S-13	45.00 - 47.00	42.1	CL	48	22	26	93.1				
	S-14	48.00 - 50.00	48.1	CH	57	30	27	72.2				
	S-15	53.00 - 55.00	39.4	CH	53	21	32	55.9				
	S-16	58.00 - 60.00	28.6									
	S-17	63.00 - 65.00	31.7									
	S-18	68.00 - 70.00	27.7									
	S-19	73.00 - 75.00	29.0									
	S-20	78.00 - 80.00	42.3	SC	45	24	21	33.6				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

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Phone: (757) 366-5100
Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-07												
	S-1	0.00 - 2.00	12.1									
	S-2	2.00 - 4.00	19.4									
	S-3	4.00 - 6.00	28.0	CH				90.2				
	S-4	6.00 - 8.00	28.7	CH	50	23	27	88.6				
	S-5	8.00 - 10.00	11.6									
	S-6	13.00 - 15.00	21.1									
	S-7	18.00 - 20.00	22.3	SP-SM	NP	NP	NP	8.7				
	S-8	23.00 - 25.00	23.6									
	S-9	28.00 - 30.00	19.0									
	S-10	33.00 - 35.00	24.4	SP-SM	NP	NP	NP	5.7				
	S-11	38.00 - 40.00	23.4									
	S-12	43.00 - 45.00	25.1	SP-SM	NP	NP	NP	7.7				
	S-13	48.00 - 50.00	24.8									
	S-14	53.00 - 55.00	24.4									
	S-15	58.00 - 60.00	24.1									
	S-16	63.00 - 65.00	38.6	SC-SM	25	19	6	28.1				
	S-17	68.00 - 70.00	30.2									
	S-18	73.00 - 75.00	29.5	SM	NP	NP	NP	12.1				
	S-19	78.00 - 80.00	9.9	SP-SM	NP	NP	NP	10.9				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

ECS MID-ATLANTIC, LLC
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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-08												
	S-1	0.00 - 2.00	8.2									
	S-2	2.00 - 4.00	13.3									
	S-3	4.00 - 6.00	12.2									
	S-4	6.00 - 8.00	6.2									
	S-5	8.00 - 10.00	16.6									
	S-6	13.00 - 15.00	21.1									
	S-7	18.00 - 20.00	20.9									
	S-8	23.00 - 25.00	28.6									
	S-9	28.00 - 30.00	28.8									
	S-10	33.00 - 35.00	36.6									
	S-11	38.00 - 40.00	32.3									
	S-12	43.00 - 45.00	35.3									
	S-13	48.00 - 50.00	27.6									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Friday, October 02, 2015

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Phone: (757) 366-5100
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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-09												
	S-1	0.00 - 2.00	11.8									
	S-2	2.00 - 4.00	9.6									
	S-3	4.00 - 6.00	69.3	SC				45.9				
	S-4	6.00 - 8.00	46.8	SC	73	29	44	38.6				
	S-5	8.00 - 10.00	44.7									
	S-7	18.00 - 20.00	25.8									
	S-8	23.00 - 25.00	36.1									
	S-9	28.00 - 30.00	32.2									
	S-10	33.00 - 35.00	31.6	CL	33	24	9	60.9				
	S-11	38.00 - 40.00	28.3									
	S-12	43.00 - 45.00	31.4									
	S-13	48.00 - 50.00	30.7									
	S-14	53.00 - 55.00	30.9									
	S-15	58.00 - 60.00	37.3									
	S-16	63.00 - 65.00	57.0									
	S-17	68.00 - 70.00	50.3									
	S-18	73.00 - 75.00	29.0									
	S-19	78.00 - 80.00	37.1									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-10												
	S-1	0.00 - 2.00	3.5									
	S-2	2.00 - 4.00	5.5									
	S-3	4.00 - 6.00	24.1									
	S-4	6.00 - 8.00	24.9	CL	35	22	13	71.7				
	S-5	8.00 - 10.00	23.1									
	S-6	13.00 - 15.00	22.9									
	S-7	18.00 - 20.00	20.6									
	S-8	23.00 - 25.00	24.0									
	S-9	28.00 - 30.00	52.4									
	S-10	33.00 - 35.00	59.6									
	S-11	38.00 - 40.00	68.4									
	S-12	43.00 - 45.00	41.1									
	S-13	48.00 - 50.00	36.1	CL	35	24	11	53.9				
BH-11												
	S-1	0.00 - 2.00	7.4									
	S-2	2.00 - 4.00	11.1									
	S-3	4.00 - 6.00	8.8	SC				45.4				
	S-4	6.00 - 8.00	11.5	SC				33.9				
	S-5	8.00 - 10.00	9.9									
	S-6	13.00 - 15.00	15.0									
	S-7	18.00 - 20.00	23.1	CL	49	23	26	89.1				
	S-8	23.00 - 25.00	30.2	CL				78.0				
	S-9	28.00 - 30.00	17.4									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-12												
	S-1	0.00 - 2.00	9.2									
	S-2	2.00 - 4.00	6.4									
	S-3	4.00 - 6.00	11.0									
	S-4	6.00 - 8.00	16.2									
	S-5	8.00 - 10.00	7.7									
	S-6	13.00 - 15.00	14.4									
	S-7	18.00 - 20.00	10.6									
	S-8	23.00 - 25.00	26.5									
	S-9	28.00 - 30.00	19.5									
BH-13												
	S-1	0.00 - 2.00	10.8									
	S-2	2.00 - 4.00	20.0	SM	21	18	3	26.8				
	S-3	4.00 - 6.00	5.1									
	S-4	6.00 - 8.00	14.6	SM	NP	NP	NP	14.3				
	S-5	8.00 - 10.00	8.4									
	S-6	13.00 - 15.00	7.3									
	S-7	18.00 - 20.00	22.6	SM	NP	NP	NP	13.6				
	S-8	23.00 - 25.00	24.2	CL	38	24	14	91.5				
	S-9	28.00 - 30.00	20.0									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-14												
	S-1	0.00 - 2.00	7.9									
	S-2	2.00 - 4.00	5.0									
	S-3	4.00 - 6.00	10.1									
	S-4	6.00 - 8.00	8.7									
	S-5	8.00 - 10.00	14.2									
	S-6	13.00 - 15.00	14.3									
	S-7	18.00 - 20.00	14.7									
	S-8	23.00 - 25.00	18.9									
	S-9	28.00 - 30.00	15.6									
BH-15												
	S-1	0.00 - 2.00	8.4	SM	NP	NP	NP	17.9				
	S-2	2.00 - 4.00	12.8									
	S-3	4.00 - 6.00	10.3									
	S-4	6.00 - 8.00	9.4									
	S-5	8.00 - 10.00	11.9									
	S-6	13.00 - 15.00	17.9									
	S-7	18.00 - 20.00	18.4	SM	NP	NP	NP	17.1				
	S-8	23.00 - 25.00	18.9									
	S-9	28.00 - 30.00	12.6									
	S-10	33.00 - 35.00	18.7	SP-SM	NP	NP	NP	9.9				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-16												
BH-17												
	S-1	0.00 - 2.00	6.5									
	S-2	2.00 - 4.00	6.8									
	S-3	4.00 - 6.00	40.3									
	S-5	8.00 - 10.00	22.6									
	S-6	13.00 - 15.00	43.9									
	S-7	18.00 - 20.00	63.4									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-18												
	S-1	0.00 - 2.00	10.8									
	S-2	2.00 - 4.00	42.2									
	S-3	4.00 - 6.00	19.2									
	S-4	6.00 - 8.00	24.2									
	S-5	8.00 - 10.00	18.3	SC				45.5				
	S-6	13.00 - 15.00	23.3									
	S-7	18.00 - 20.00	27.4									
	S-8	23.00 - 25.00	26.1									
	S-9	28.00 - 30.00	32.8									
	S-10	33.00 - 35.00	33.2									
	S-11	38.00 - 40.00	38.7									
	S-12	43.00 - 45.00	35.7	CL	35	21	14	71.7				
	S-13	48.00 - 50.00	30.7									
	S-14	53.00 - 55.00	27.7									
	S-15	58.00 - 60.00	44.2									
	S-16	63.00 - 65.00	59.1	CH	78	33	45	93.8				
	S-17	68.00 - 70.00	60.2									
	S-18	70.00 - 72.00	59.8									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-19												
	S-1	0.00 - 2.00	17.7									
	S-2	2.00 - 4.00	19.7									
	S-3	4.00 - 6.00	26.8									
	S-4	6.00 - 8.00	30.4									
	S-5	8.00 - 10.00	23.7									
	S-6	13.00 - 15.00	22.4									
	S-7	18.00 - 20.00	21.8									
	S-8	23.00 - 25.00	22.4									
	S-9	28.00 - 30.00	22.9									
	S-10	33.00 - 35.00	25.6									
	S-11	38.00 - 40.00	24.9									
	S-12	43.00 - 45.00	24.4									
	S-13	48.00 - 50.00	20.0									
BH-20												
	S-1	0.00 - 2.00	5.6									
	S-2	2.00 - 4.00	15.0									
	S-3	4.00 - 6.00	12.0									
	S-4	6.00 - 8.00	28.0	CH	58	30	28	78.4				
	S-5	8.00 - 10.00	16.8	SM	21	18	3	40.1				
	S-6	13.00 - 15.00	20.6									
	S-7	18.00 - 20.00	21.8									
	S-8	23.00 - 25.00	22.3									
	S-9	28.00 - 30.00	24.4	SM	NP	NP	NP	13.1				
	S-10	33.00 - 35.00	18.4									
	S-11	38.00 - 40.00	23.2									
	S-12	43.00 - 45.00	22.2									
	S-13	48.00 - 50.00	23.3									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-21												
	S-1	0.00 - 2.00	14.9									
	S-2	2.00 - 4.00	13.7									
	S-3	4.00 - 6.00	15.7									
	S-4	6.00 - 8.00	11.2									
	S-5	8.00 - 10.00	14.8									
	S-6	13.00 - 15.00	24.6									
	S-7	18.00 - 20.00	19.8									
	S-8	23.00 - 25.00	21.4									
	S-9	28.00 - 30.00	21.4									
	S-10	33.00 - 35.00	22.2									
	S-11	38.00 - 40.00	20.6									
	S-12	43.00 - 45.00	21.3									
	S-13	48.00 - 50.00	19.4									
BH-22												
	S-1	0.00 - 2.00	11.1									
	S-2	2.00 - 4.00	11.8									
	S-3	4.00 - 6.00	14.1									
	S-4	6.00 - 8.00	10.1									
	S-5	8.00 - 10.00	15.1	SC-SM	22	16	6	38.0				
	S-6	13.00 - 15.00	12.7									
	S-7	18.00 - 20.00	20.1									
	S-8	23.00 - 25.00	20.4	SP-SM	NP	NP	NP	11.3				
	S-9	28.00 - 30.00	21.1									
	S-10	33.00 - 35.00	21.4	SP-SM	NP	NP	NP	7.1				
	S-11	38.00 - 40.00	22.5									
	S-12	43.00 - 45.00	18.3									
	S-13	48.00 - 50.00	36.3									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-23												
	S-1	0.00 - 2.00	15.2									
	S-2	2.00 - 4.00	10.3									
	S-3	4.00 - 6.00	13.4									
	S-4	6.00 - 8.00	11.5									
	S-5	8.00 - 10.00	9.6									
	S-6	13.00 - 15.00	18.6									
	S-7	18.00 - 20.00	22.1									
	S-8	23.00 - 25.00	20.1									
	S-9	28.00 - 30.00	21.2									
	S-10	33.00 - 35.00	15.1									
	S-11	38.00 - 40.00	19.5									
	S-12	43.00 - 45.00	45.5									
	S-13	48.00 - 50.00	48.0									
BH-24												
	S-1	0.00 - 2.00	10.2									
	S-2	2.00 - 4.00	10.6									
	S-3	4.00 - 6.00	12.0									
	S-4	6.00 - 8.00	8.5									
	S-5	8.00 - 10.00	12.0									
	S-6	13.00 - 15.00	11.9									
	S-7	18.00 - 20.00	12.5									
	S-8	23.00 - 25.00	11.2	SM	NP	NP	NP	25.0				
	S-9	28.00 - 30.00	14.1									
	S-10	33.00 - 35.00	21.2									
	S-11	38.00 - 40.00	22.6									
	S-12	43.00 - 45.00	27.9	SM	NP	NP	NP	16.9				
	S-13	48.00 - 50.00	16.4	SP-SM	NP	NP	NP	7.1				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-25												
	S-1	0.00 - 2.00	9.9									
	S-2	2.00 - 4.00	10.9									
	S-3	4.00 - 6.00	12.2									
	S-4	6.00 - 8.00	14.3									
	S-5	8.00 - 10.00	8.4									
	S-6	13.00 - 15.00	16.4									
	S-7	18.00 - 20.00	13.7									
	S-8	23.00 - 25.00	13.1									
	S-9	28.00 - 30.00	13.2									
	S-10	33.00 - 35.00	14.2									
	S-11	38.00 - 40.00	20.1									
	S-12	43.00 - 45.00	19.5									
	S-13	48.00 - 50.00	23.0									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-26												
	S-1	0.00 - 2.00	6.0									
	S-2	2.00 - 4.00	2.9									
	S-3	4.00 - 6.00	13.9									
	S-4	6.00 - 8.00	19.7									
	S-5	8.00 - 10.00	21.3									
	S-6	13.00 - 15.00	57.3	CH	91	35	56	85.1				
	S-7	18.00 - 20.00	77.6	CH				64.8				
	S-8	23.00 - 25.00	32.5									
	S-9	28.00 - 30.00	31.9	CL	35	21	14	57.7				
	S-10	33.00 - 35.00	39.8									
	S-11	38.00 - 40.00	27.4									
	S-12	43.00 - 45.00	31.5									
	S-13	48.00 - 50.00	32.9									
	S-14	53.00 - 55.00	28.1									
	S-15	58.00 - 60.00	26.4	SC	32	22	10	21.6				
	S-16	63.00 - 65.00	30.0									
	S-17	68.00 - 70.00	40.7									
	S-18	73.00 - 75.00	33.8									
	S-19	78.00 - 80.00	47.9	SC	40	20	20	45.7				
	S-20	83.00 - 85.00	30.9									
	S-21	88.00 - 90.00	31.0									
	S-22	93.00 - 95.00	58.1	CH	84	34	50	88.5				
	S-23	98.00 - 100.00	59.7									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 04:9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-27												
	S-1	0.00 - 2.00	5.6									
	S-2	2.00 - 4.00	18.3									
	S-3	4.00 - 6.00	18.1	SC				48.4				
	S-4	6.00 - 8.00	14.3									
	S-5	8.00 - 10.00	18.5									
	S-6	13.00 - 15.00	22.6									
	S-7	18.00 - 20.00	28.0	SM	NP	NP	NP	13.5				
	S-8	23.00 - 25.00	28.1									
	S-9	28.00 - 30.00	31.4	SM	NP	NP	NP	45.3				
	S-10	33.00 - 35.00	33.2									
	S-12	43.00 - 45.00	28.0									
	S-13	48.00 - 50.00	35.9	CL	31	22	9	69.1				
	S-14	53.00 - 55.00	30.4									
	S-15	58.00 - 60.00	26.8									
	S-16	63.00 - 65.00	26.0									
	S-17	68.00 - 70.00	35.5	SM				19.8				
	S-18	73.00 - 75.00	23.8									
	S-19	78.00 - 80.00	30.0									
	S-20	83.00 - 85.00	31.3									
	S-21	88.00 - 90.00	35.4									
	S-22	93.00 - 95.00	54.5									
	S-23	98.00 - 100.00	59.7	CH	80	29	51	82.7				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-28												
	S-1	0.00 - 2.00	7.7	SM	NP	NP	NP	22.0				
	S-2	2.00 - 4.00	10.7	SC				49.4				
	S-3	4.00 - 6.00	21.9	CL				89.2				
	S-4	6.00 - 8.00	12.9	SM				39.4				
	S-5	8.00 - 10.00	6.5	SM	NP	NP	NP	17.8				
	S-6	13.00 - 15.00	21.3	SP-SM	NP	NP	NP	8.1				
BH-29												
	S-1	0.00 - 2.00	9.0	SM				29.0				
	S-2	2.00 - 4.00	20.6	CL				88.2				
	S-3	4.00 - 6.00	10.6	SM				32.9				
	S-4	6.00 - 8.00	9.1	SM	NP	NP	NP	20.0				
	S-5	8.00 - 10.00	6.4	SP-SM	NP	NP	NP	9.7				
	S-6	13.00 - 15.00	19.4	SP-SM	NP	NP	NP	7.8				
BH-30												
	S-1	0.00 - 2.00	14.5	CL				57.6				
	S-2	2.00 - 4.00	20.8	CL				81.9				
	S-3	4.00 - 6.00	13.4	SM				35.7				
	S-4	6.00 - 8.00	11.2	SM	NP	NP	NP	14.4				
	S-5	8.00 - 10.00	16.4	SM	NP	NP	NP	12.2				
	S-6	13.00 - 15.00	22.5	SP-SM	NP	NP	NP	8.0				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-31												
	S-1	0.00 - 2.00	6.3					52.0				
	S-2	2.00 - 4.00	8.3					54.3				
	S-3	4.00 - 6.00	39.0					42.2				
	S-4	6.00 - 8.00	57.4					42.1				
	S-5	8.00 - 10.00	75.4	SM	80	44	36	48.7				
	S-6	13.00 - 15.00	27.0					24.1				
BH-32												
	S-1	0.00 - 2.00	5.1					40.2				
	S-2	2.00 - 4.00	6.9					40.1				
	S-3	4.00 - 6.00	6.4					47.2				
	S-4	6.00 - 8.00	90.2					61.1				
	S-5	8.00 - 10.00	117.6					77.4				
	S-6	13.00 - 15.00	20.1					59.9				
BH-33												
	S-1	0.00 - 2.00	4.1					31.7				
	S-2	2.00 - 4.00	13.7	SM	NP	NP	NP	30.4				
	S-3	4.00 - 6.00	50.1					42.1				
	S-4	6.00 - 8.00	136.0					52.1				
	S-5	8.00 - 10.00	162.6					63.1				
	S-6	13.00 - 15.00	26.2					80.7				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-34												
	S-1	0.00 - 2.00	3.4									
	S-2	2.00 - 4.00	11.7									
	S-3	4.00 - 6.00	78.6									
	S-4	6.00 - 8.00	38.2									
	S-5	8.00 - 10.00	151.0		209	118	91	13.2				
	S-6	13.00 - 15.00	91.7									
	S-7	18.00 - 20.00	34.3									
	S-8	23.00 - 25.00	29.8									
	S-9	28.00 - 30.00	29.2									
	S-10	33.00 - 35.00	34.6	SM	35	25	10	49.2				
	S-11	38.00 - 40.00	47.7									
	S-12	43.00 - 45.00	35.8									
	S-13	48.00 - 50.00	31.1									
BH-35												
	S-1	0.00 - 2.00	9.5									
	S-2	2.00 - 4.00	3.6									
	S-3	4.00 - 6.00	5.7									
	S-4	6.00 - 8.00	4.8									
	S-5	8.00 - 10.00	4.4									
	S-6	13.00 - 15.00	16.9									
	S-7	18.00 - 20.00	20.4									
	S-8	23.00 - 25.00	23.3									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-36												
	S-1	0.00 - 2.00	11.7									
	S-2	2.00 - 4.00	5.0									
	S-3	4.00 - 6.00	7.8									
	S-4	6.00 - 8.00	7.1									
	S-5	8.00 - 10.00	6.1	SP-SM	NP	NP	NP	9.1				
	S-6	13.00 - 15.00	12.8									
	S-7	18.00 - 20.00	14.5	SM	22	NP	NP	24.3				
	S-8	23.00 - 25.00	25.7	SM	NP	NP	NP	18.5				
BH-37												
	S-1	0.00 - 2.00	12.1									
	S-2	2.00 - 4.00	8.9									
	S-3	4.00 - 6.00	5.7									
	S-4	6.00 - 8.00	6.4									
	S-5	8.00 - 10.00	7.6									
	S-6	13.00 - 15.00	8.5									
	S-7	18.00 - 20.00	7.3									
	S-8	23.00 - 25.00	19.4									
BH-38												
	S-1	0.00 - 2.00	8.0									
	S-2	2.00 - 4.00	2.9									
	S-3	4.00 - 6.00	5.1									
	S-4	6.00 - 8.00	4.6	SP-SM	NP	NP	NP	10.1				
	S-5	8.00 - 10.00	5.0									
	S-6	13.00 - 15.00	12.4	SP-SM	NP	NP	NP	10.9				
	S-7	18.00 - 20.00	21.1									
	S-8	23.00 - 25.00	23.5	SP-SM	NP	NP	NP	6.7				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-39												
	S-1	0.00 - 2.00	6.1									
	S-2	2.00 - 4.00	3.9									
	S-3	4.00 - 6.00	4.0									
	S-4	6.00 - 8.00	4.0									
	S-5	8.00 - 10.00	4.9									
	S-6	13.00 - 15.00	16.3									
	S-7	18.00 - 20.00	10.0									
	S-8	23.00 - 25.00	22.5									
BH-41												
	S-1	0.00 - 2.00	9.1									
	S-2	2.00 - 4.00	7.0									
	S-3	4.00 - 6.00	8.0									
	S-4	6.00 - 8.00	8.2									
	S-5	8.00 - 10.00	6.6									
	S-6	13.00 - 15.00	10.8									
	S-7	18.00 - 20.00	12.9									
	S-8	23.00 - 25.00	11.6									
BH-42												
	S-1	0.00 - 2.00	13.4									
	S-2	2.00 - 4.00	21.6									
	S-3	4.00 - 6.00	58.1									
	S-4	6.00 - 8.00	71.2									
	S-5	8.00 - 10.00	39.6	SC	33	22	11	37.8				
	S-6	13.00 - 15.00	23.5									
	S-7	18.00 - 20.00	28.2									
	S-8	23.00 - 25.00	29.2	CL	34	17	17	69.8				
	S-9	28.00 - 30.00	30.1									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-43												
	S-1	0.00 - 2.00	2.9									
	S-2	2.00 - 4.00	5.0									
	S-3	4.00 - 6.00	15.1									
	S-4	6.00 - 8.00	37.0									
	S-5	8.00 - 10.00	51.4	MH	65	35	30	66.3				
	S-6	13.00 - 15.00	25.0									
	S-7	18.00 - 20.00	24.5									
	S-8	23.00 - 25.00	50.1	CH	64	27	37	69.1				
	S-9	28.00 - 30.00	26.3									
BH-44												
	S-1	0.00 - 2.00	4.9									
	S-2	2.00 - 4.00	7.1									
	S-3	4.00 - 6.00	6.7									
	S-4	6.00 - 8.00	16.5									
	S-5	8.00 - 10.00	28.6									
	S-6	13.00 - 15.00	22.0									
	S-7	18.00 - 20.00	21.8									
	S-8	23.00 - 25.00	26.6									
	S-9	28.00 - 30.00	114.6	SM	204	149	55	26.5				
	S-10	33.00 - 35.00	35.1	ML	35	25	10	71.3				
	S-11	38.00 - 40.00	29.4									
BH-45												

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

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					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-46												
	S-1	0.00 - 2.00	11.0									
	S-2	2.00 - 4.00	9.1									
	S-3	4.00 - 6.00	12.7									
	S-4	6.00 - 8.00	12.5									
	S-5	8.00 - 10.00	12.1									
	S-6	13.00 - 15.00	17.5									
	S-7	18.00 - 20.00	17.2									
	S-8	23.00 - 25.00	21.9									
	S-9	28.00 - 30.00	22.5									
	S-10	33.00 - 35.00	26.6	SM	NP	NP	NP	15.8				
	S-11	38.00 - 40.00	30.9	CL	33	18	15	69.2				
BH-47												
	S-1	0.00 - 2.00	18.0	CL				51.6				
	S-2	2.00 - 4.00	20.9									
	S-3	4.00 - 6.00	21.4									
	S-4	6.00 - 8.00	21.6									
	S-5	8.00 - 10.00	19.2									
	S-6	13.00 - 15.00	21.6									
	S-7	18.00 - 20.00	22.9									
	S-8	23.00 - 25.00	39.3									
	S-9	28.00 - 30.00	39.3									
	S-10	33.00 - 35.00	58.2	CL				72.8				
	S-11	38.00 - 40.00	46.6									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-48												
	S-1	0.00 - 2.00	37.9									
	S-2	2.00 - 4.00	7.6									
	S-3	4.00 - 6.00	16.2									
	S-4	6.00 - 8.00	26.5									
	S-5	8.00 - 10.00	28.1									
	S-6	13.00 - 15.00	23.1									
	S-7	18.00 - 20.00	24.4									
	S-8	23.00 - 25.00	32.5									
	S-9	28.00 - 30.00	26.4									
	S-10	33.00 - 35.00	39.9									
	S-11	38.00 - 40.00	54.2									
BH-49												
	S-1	0.00 - 2.00	9.9									
	S-2	2.00 - 4.00	11.1									
	S-3	4.00 - 6.00	22.5									
	S-4	6.00 - 8.00	21.3									
	S-5	8.00 - 10.00	25.2	SM				22.8				
	S-6	13.00 - 15.00	24.4									
	S-7	18.00 - 20.00	24.7									
	S-8	23.00 - 25.00	29.1									
	S-10	33.00 - 35.00	36.3									
	S-11	38.00 - 40.00	38.3	SC				46.1				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 04:9663-O

Project Name: VDOT I-64/264 PN:0264-122-108 UPC57048

PM: David M. Anderson

PE: Michael J. Galli

Printed On: Monday, October 12, 2015

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-50												
	S-1	0.00 - 2.00	20.3									
	S-2	2.00 - 4.00	12.1	CL	39	21	18	83.3				
	S-3	4.00 - 6.00	3.9	SM	NP	NP	NP	14.2				
	S-4	6.00 - 8.00	3.9									
	S-5	8.00 - 10.00	8.1									
	S-6	13.00 - 15.00	22.5									
	S-7	18.00 - 20.00	22.2									
	S-8	23.00 - 25.00	26.0	SP-SM	NP	NP	NP	8.6				
	S-9	28.00 - 30.00	22.7									
BH-51												
	S-1	0.00 - 2.00	13.9									
	S-2	2.00 - 4.00	10.7									
	S-3	4.00 - 6.00	3.7									
	S-4	6.00 - 8.00	11.7									
	S-5	8.00 - 10.00	24.1									
	S-6	13.00 - 15.00	24.1									
	S-7	18.00 - 20.00	23.1									
	S-8	23.00 - 25.00	27.9									
	S-9	28.00 - 30.00	32.2									

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

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Laboratory Testing Summary

Sample Source	Sample Number	Depth (feet)	MC[1] (%)	Soil Type[2]	Atterberg Limits[3]			Percent Passing No. 200 Sieve[4]	Moisture - Density (Corr.)[5]		CBR Value[6]	Other
					LL	PL	PI		Maximum Density (pcf)	Optimum Moisture (%)		
BH-52												
	S-1	0.00 - 2.00	2.9									
	S-2	2.00 - 4.00	13.6									
	S-3	4.00 - 6.00	20.6									
	S-4	6.00 - 8.00	22.7	SP-SM	NP	NP	NP	11.7				
	S-5	8.00 - 10.00	19.7									
	S-6	13.00 - 15.00	24.0									
	S-7	18.00 - 20.00	24.7									
	S-8	23.00 - 25.00	30.2	SM	NP	NP	NP	26.6				
	S-9	28.00 - 30.00	24.3	CL	26	17	9	61.4				
BH-53												
	S-1	0.00 - 2.00	6.0	CL	33	18	15	55.1				
	S-2	2.00 - 4.00	11.5	SC	28	13	15	37.4				
	S-3	4.00 - 6.00	10.7	SP-SM	NP	NP	NP	10.2				
	S-4	6.00 - 8.00	25.4	SP-SM	NP	NP	NP	8.3				
	S-5	8.00 - 10.00	35.0	SM	NP	NP	NP	13.8				
	S-6	13.00 - 15.00	23.9	SP-SM	NP	NP	NP	5.8				
BH-54												
	S-1	0.00 - 2.00	8.7	CL-ML	22	15	7	68.3				
	S-2	2.00 - 4.00	9.4	SC				47.6				
	S-3	4.00 - 6.00	15.5	SP-SC	24	18	6	12.0				
	S-4	6.00 - 8.00	17.6	SP-SM	NP	NP	NP	8.5				
	S-5	8.00 - 10.00	23.5	SM	NP	NP	NP	13.8				
	S-6	13.00 - 15.00	20.2	SP-SM	NP	NP	NP	10.0				

Notes: 1. ASTM D 2216, 2. ASTM D 2487, 3. ASTM D 4318, 4. ASTM D 1140, 5. See test reports for test method, 6. See test reports for test method

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content (ASTM D 2974)

Project No. 04:9663-O

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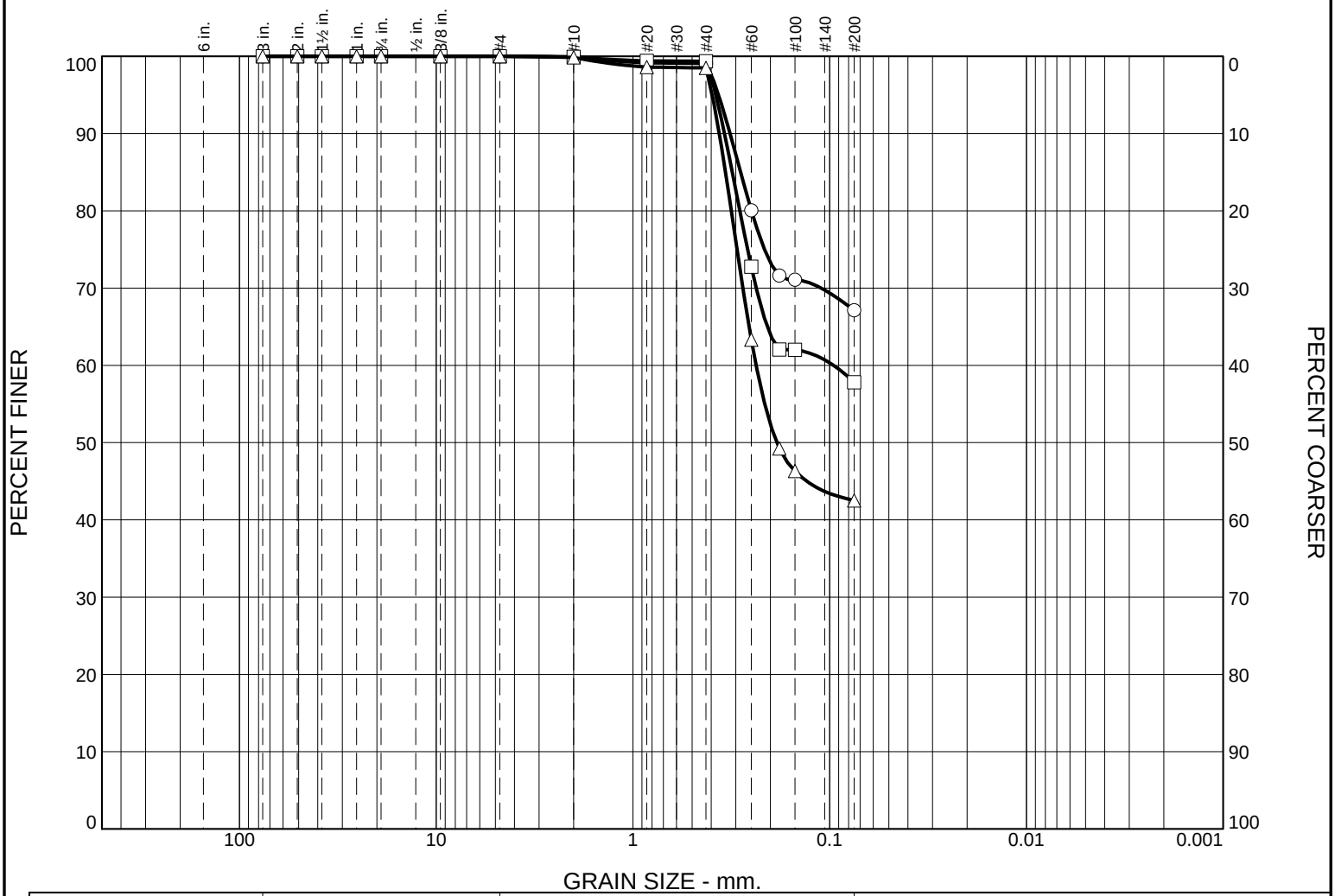
Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.8	32.0	67.1	
□	0.0	0.0	0.0	0.1	0.5	41.6	57.8	
△	0.0	0.0	0.0	0.1	1.4	56.0	42.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31	16	0.2834							
□	32	15	0.3123	0.0954						
△	NP	NP	0.3382	0.2363	0.1854					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown mottled orange, SANDY LEAN CLAY	08/24/2015	CL	12.3
□ Brown mottled orange, SANDY LEAN CLAY	08/24/2015	CL	15.4
△ Brown, SILTY SAND	08/24/2015	SM	15.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-01 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-01 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-01 **Depth:** 4.00-6.00 **Sample Number:** S-3

Remarks:

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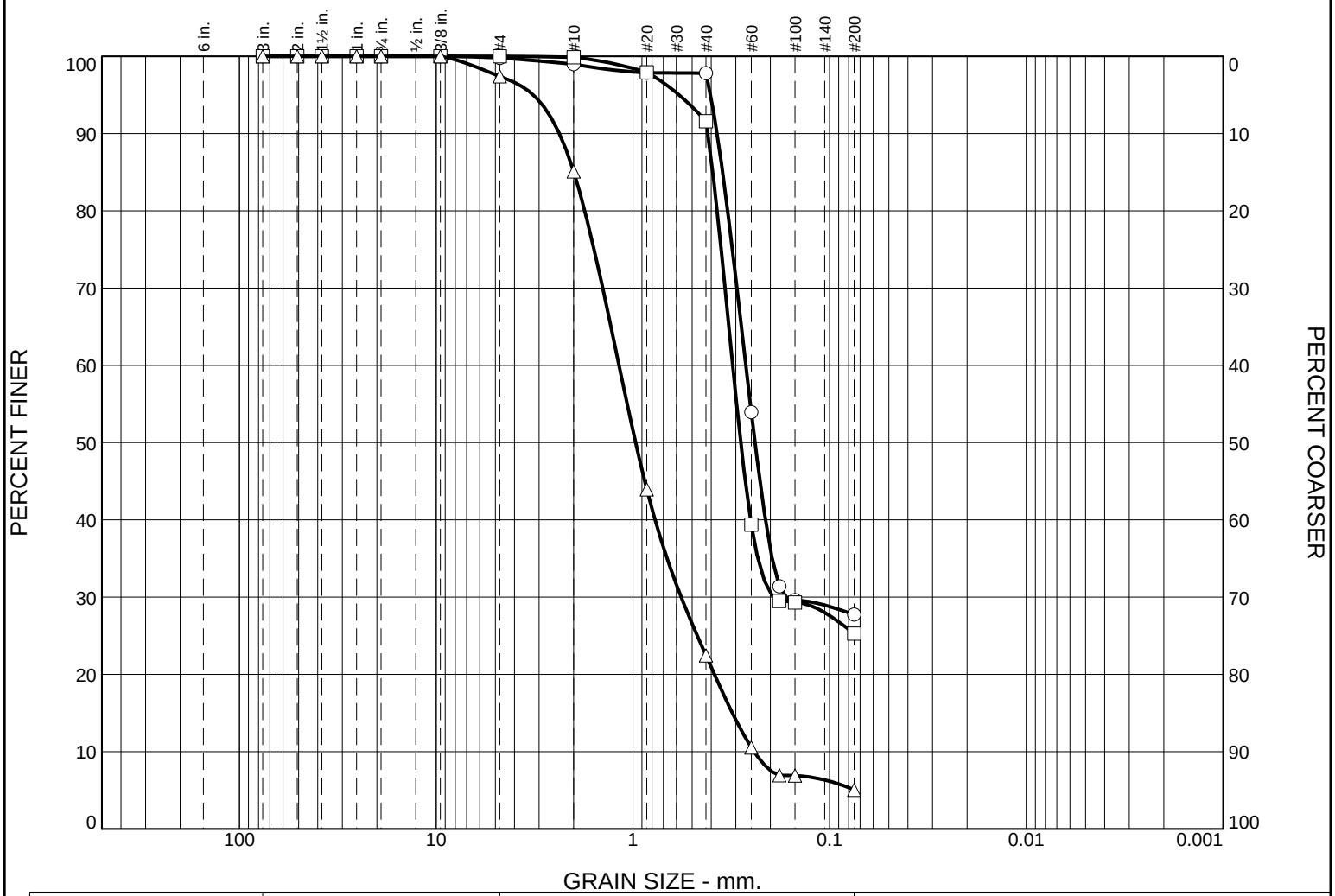
Figure

Tested By: TL **Checked By:** RJW

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.8	1.2	70.1	27.7	
□	0.0	0.0	0.0	0.1	8.3	66.3	25.3	
△	0.0	0.0	2.6	12.3	62.6	17.4	5.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3499	0.2666	0.2394	0.1673				
□	NP	NP	0.3927	0.3110	0.2830	0.1921				
△	NP	NP	1.9945	1.1769	0.9687	0.5681	0.3121	0.2422	1.13	4.86

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SILTY SAND	08/24/2015	SM	18.9
□ Brown, SILTY SAND	08/24/2015	SM	19.4
△ Brown-orange, POORLY GRADED SAND WITH SILT	08/24/2015	SP-SM	14.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-01 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-01 **Depth:** 8.00-10.00 **Sample Number:** S-5

△ **Source of Sample:** BH-01 **Depth:** 13.00-15.00 **Sample Number:** S-6

Remarks:

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Virginia Beach, VA 23452
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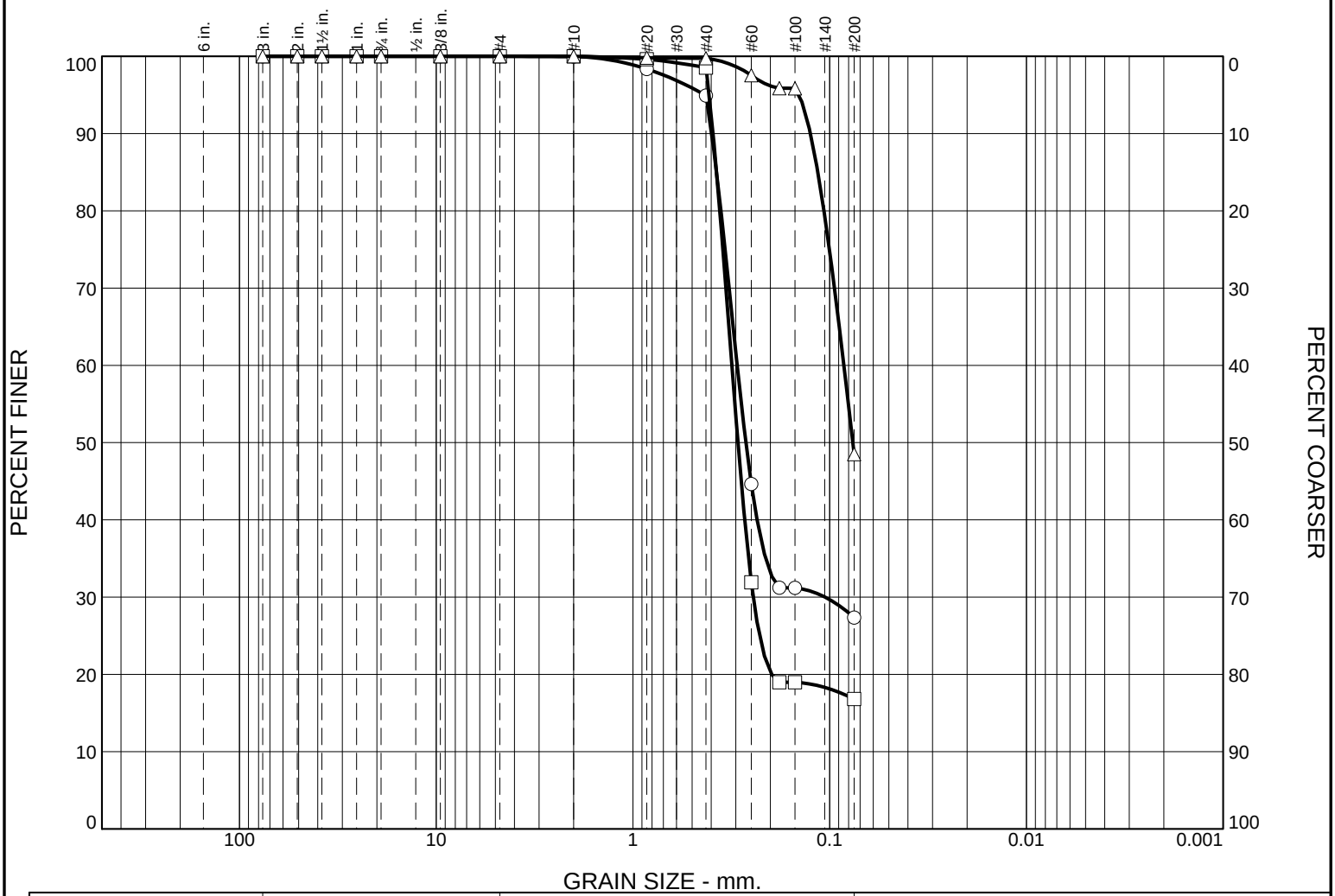
Figure

Tested By: TL **Checked By:** RJW

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	5.1	67.5	27.4	
□	0.0	0.0	0.0	0.0	1.5	81.7	16.8	
△	0.0	0.0	0.0	0.0	0.3	51.2	48.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3757	0.2950	0.2664	0.1054				
□	NP	NP	0.3756	0.3139	0.2923	0.2445				
△	33	24	0.1148	0.0846	0.0762					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SILTY SAND	08/24/2015	SM	9.5
□ Light brown, SILTY SAND	08/24/2015	SM	15.7
△ Gray, CLAYEY SAND	08/24/2015	SC	38.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-02 **Depth:** 2.00-4.00 **Sample Number:** S-2

□ **Source of Sample:** BH-02 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-02 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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Phone: (757) 366-5100
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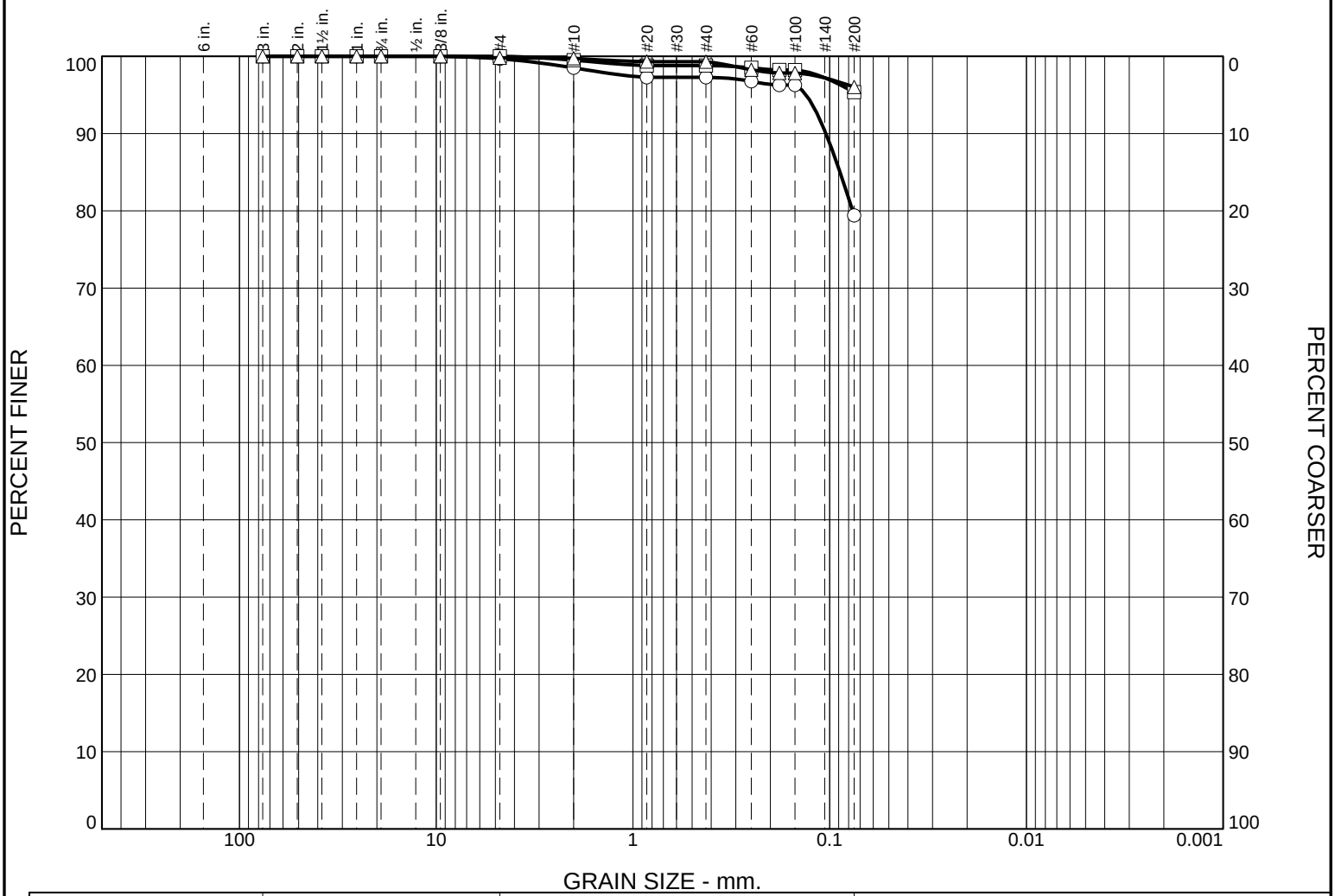
Figure

Tested By: ○ TL □ TL △ hr **Checked By:** RJW

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	1.2	1.2	17.9	79.4	
□	0.0	0.0	0.0	0.5	0.7	3.4	95.4	
△	0.0	0.0	0.2	0.1	0.4	3.3	96.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	35	22	0.0886							
□	57	19								
△	64	23								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, LEAN CLAY WITH SAND, contains marine shell fragments	08/24/2015	CL	37.8
□ Dark gray, FAT CLAY, trace marine shell fragments	08/24/2015	CH	42.6
△ Dark gray, FAT CLAY, contains marine shell fragments	08/24/2015	CH	57.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-02 **Depth:** 33.00-35.00 **Sample Number:** S-10

□ **Source of Sample:** BH-02 **Depth:** 43.00-45.00 **Sample Number:** S-12

△ **Source of Sample:** BH-02 **Depth:** 53.00-55.00 **Sample Number:** S-14

Remarks:

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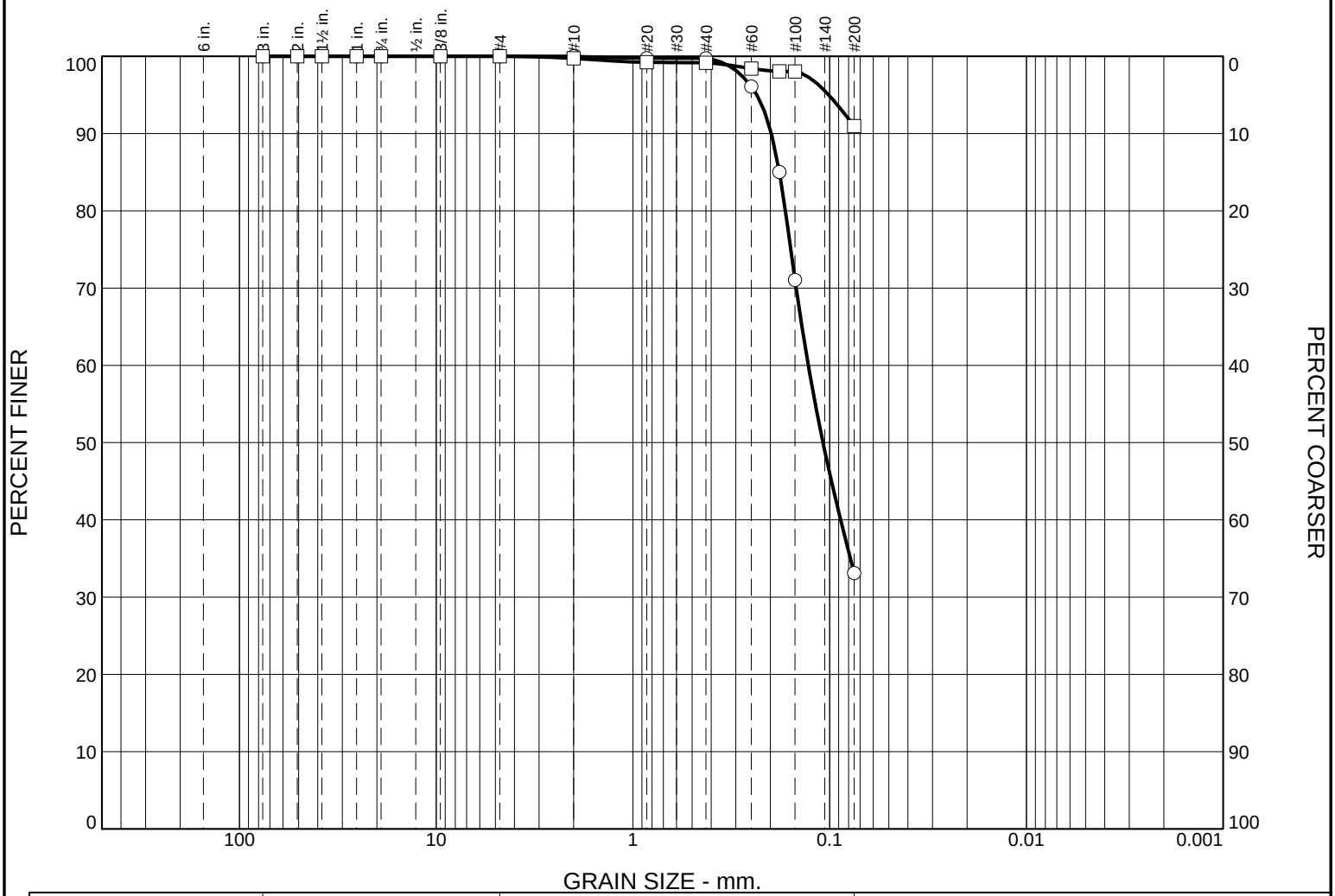
Figure

Tested By: ○ tl □ hr △ tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	66.6	33.1	
□	0.0	0.0	0.0	0.3	0.5	8.2	91.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	25	17	0.1799	0.1284	0.1081					
□	66	27								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, CLAYEY SAND	08/24/2015	SC	35.5
□ Gray, FAT CLAY	08/24/2015	CH	62.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-02 **Depth:** 58.00-60.00 **Sample Number:** S-15

□ **Source of Sample:** BH-02 **Depth:** 78.00-80.00 **Sample Number:** S-19

Remarks:

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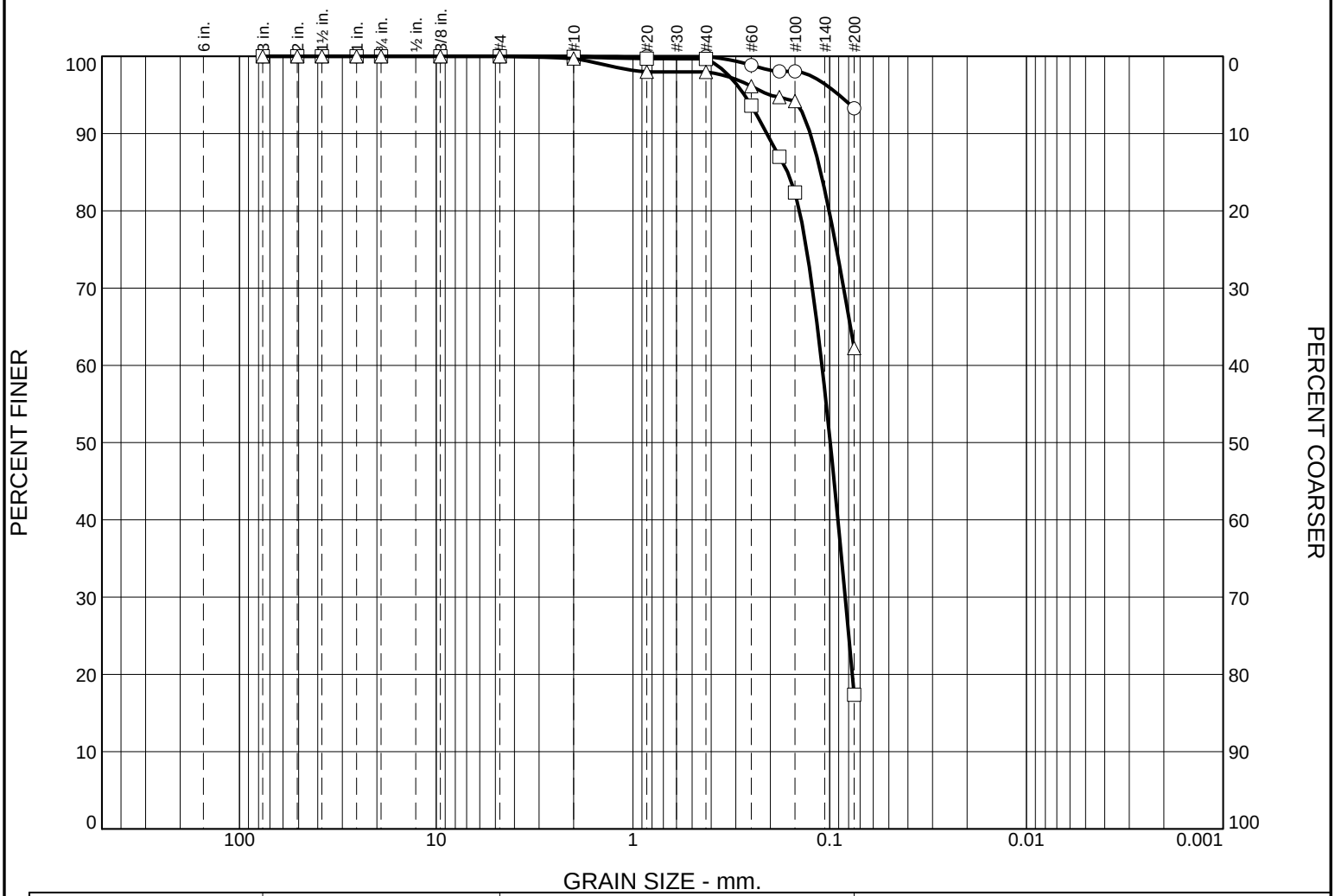
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	6.7	93.3	
□	0.0	0.0	0.0	0.1	0.2	82.3	17.4	
△	0.0	0.0	0.0	0.3	1.7	35.8	62.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	36	19								
□	NP	NP	0.1634	0.1094	0.0992	0.0833				
△	48	22	0.1110							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange mottled gray, LEAN CLAY	08/24/2015	CL	26.8
□ Gray, SILTY SAND	08/24/2015	SM	31.8
△ Gray, SANDY LEAN CLAY	08/24/2015	CL	51.5

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-03 **Depth:** 2.00-4.00 **Sample Number:** S-2

□ **Source of Sample:** BH-03 **Depth:** 18.00-20.00 **Sample Number:** S-7

△ **Source of Sample:** BH-03 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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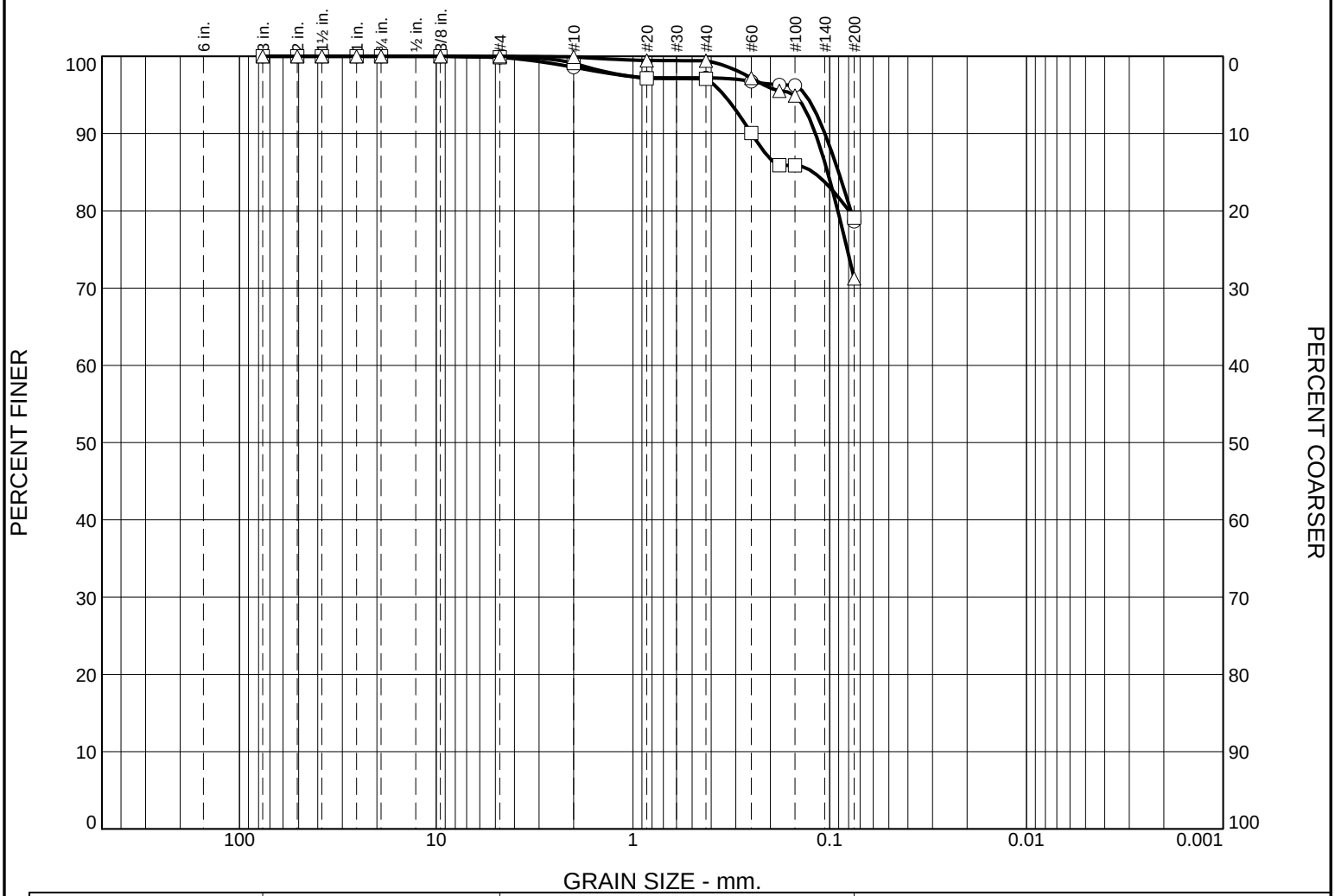
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	1.3	1.4	18.6	78.6	
□	0.0	0.0	0.1	0.8	2.0	18.0	79.1	
△	0.0	0.0	0.0	0.1	0.5	28.2	71.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	41	24	0.0900							
□	47	18	0.1211							
△	48	20	0.1024							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SANDY LEAN CLAY, contains marine shell fragments	08/24/2015	CL	40.2
□ Gray, SANDY LEAN CLAY, contains marine shell fragments	08/24/2015	CL	41.8
△ Gray, SANDY LEAN CLAY	08/24/2015	CL	56.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-03 **Depth:** 33.00-35.00 **Sample Number:** S-10

□ **Source of Sample:** BH-03 **Depth:** 48.00-50.00 **Sample Number:** S-13

△ **Source of Sample:** BH-03 **Depth:** 58.00-60.00 **Sample Number:** S-15

Remarks:

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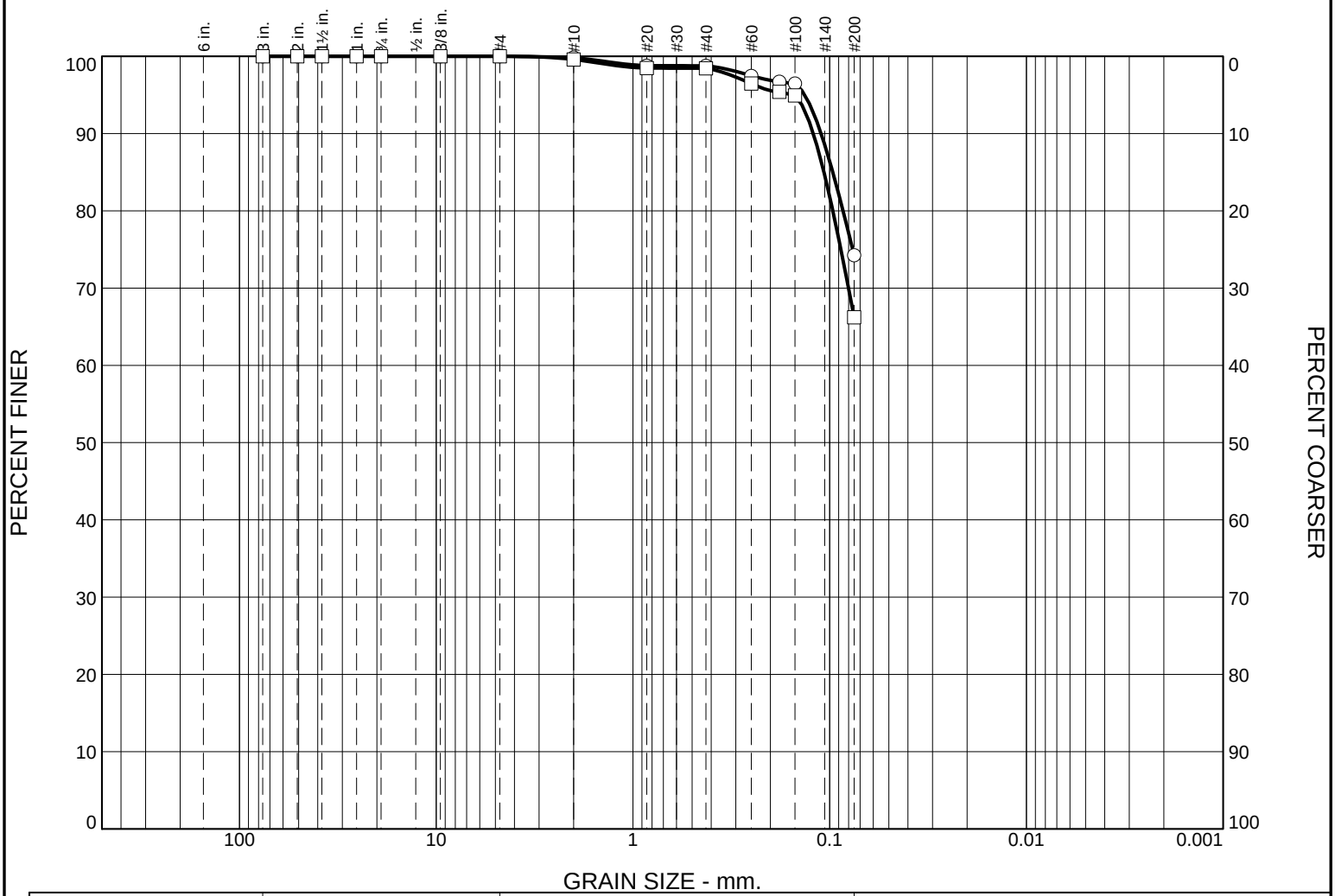
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.2	1.0	24.6	74.2	
□	0.0	0.0	0.0	0.4	1.1	32.3	66.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	51	21	0.0963							
□	53	23	0.1068							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, FAT CLAY WITH SAND	08/24/2015	CH	55.3
□ Gray, SANDY FAT CLAY	08/24/2015	CH	52.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-03 **Depth:** 63.00-65.00 **Sample Number:** S-16

□ **Source of Sample:** BH-03 **Depth:** 73.00-75.00 **Sample Number:** S-18

Remarks:

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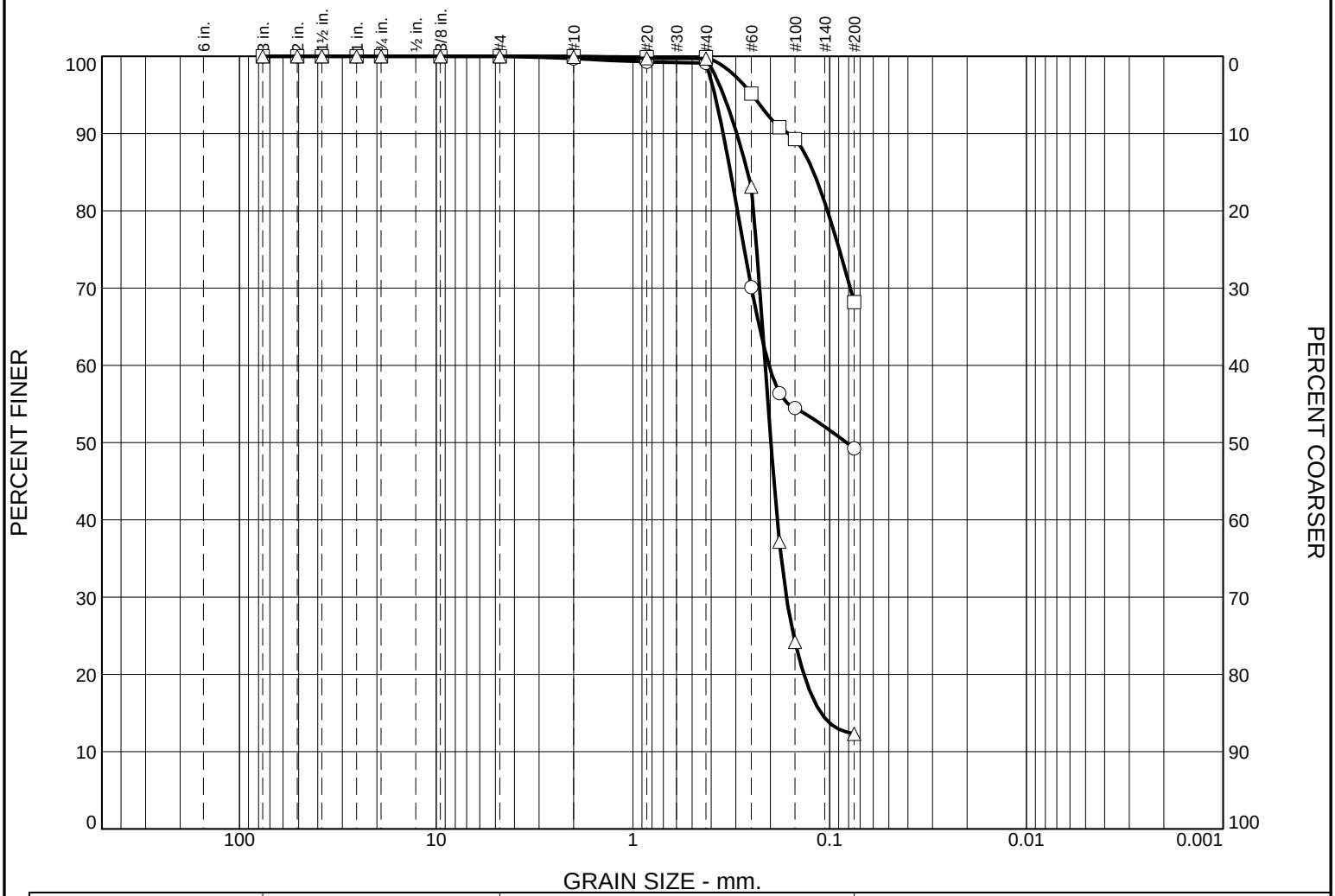
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	0.6	49.8	49.3	
□	0.0	0.0	0.0	0.0	0.1	31.7	68.2	
△	0.0	0.0	0.0	0.1	0.2	87.4	12.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	34	15	0.3189	0.2033	0.0820					
□	35	22	0.1207							
△	NP	NP	0.2610	0.2124	0.1988	0.1659	0.1105			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, CLAYEY SAND	08/24/2015	SC	15.1
□ Brown, SANDY LEAN CLAY	08/24/2015	CL	31.1
△ Gray, SILTY SAND	08/24/2015	SM	24.0

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-04 **Depth:** 2.00-4.00 **Sample Number:** S-2

□ **Source of Sample:** BH-04 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-04 **Depth:** 18.00-20.00 **Sample Number:** S-7

Remarks:

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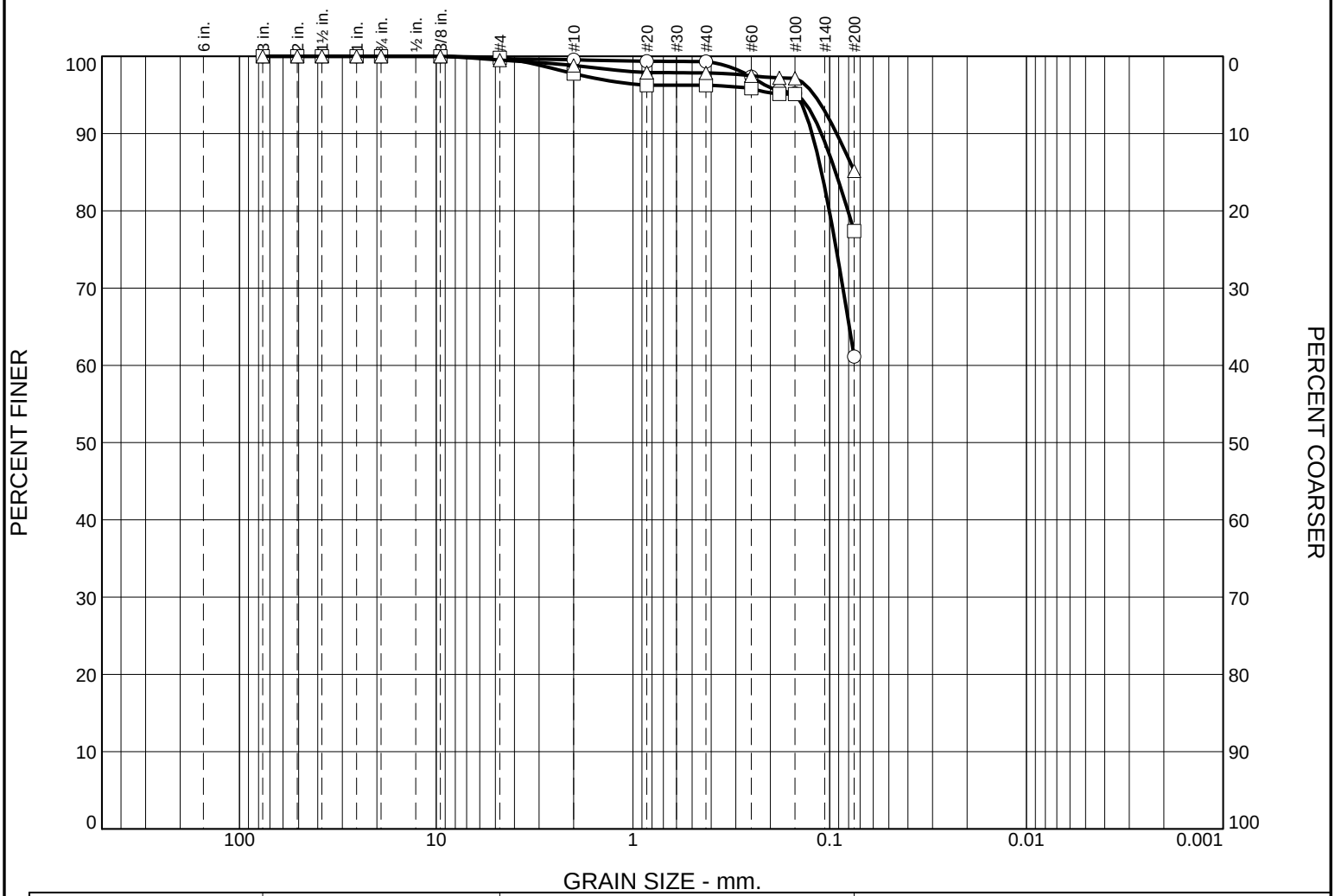
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.1	0.3	38.2	61.1	
□	0.0	0.0	0.2	2.0	1.5	18.9	77.4	
△	0.0	0.0	0.5	0.7	1.0	12.6	85.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	53	24	0.1099							
□	33	22	0.0932							
△	44	24								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SANDY FAT CLAY, contains marine shell fragments	08/24/2015	CH	46.2
□ Gray, LEAN CLAY WITH SAND, contains marine shell fragments	08/24/2015	CL	38.6
△ Gray, LEAN CLAY	08/24/2015	CL	40.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-04 **Depth:** 23.00-25.00 **Sample Number:** S-8

□ **Source of Sample:** BH-04 **Depth:** 35.00-37.00 **Sample Number:** S-11

△ **Source of Sample:** BH-04 **Depth:** 38.00-40.00 **Sample Number:** S-12

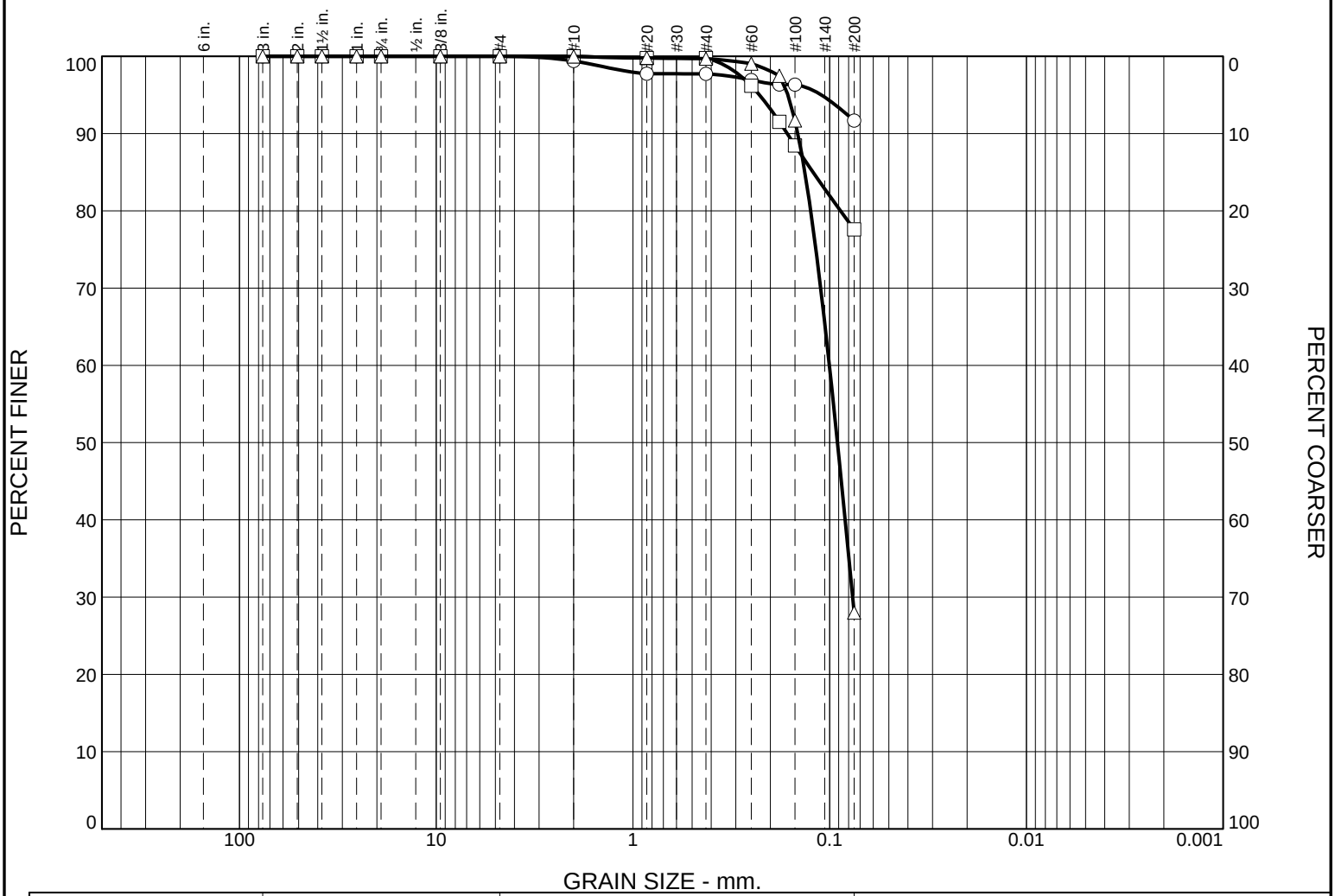
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: ○ tl □ hmr △ tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	1.7	6.0	91.7	
□	0.0	0.0	0.0	0.0	0.2	22.2	77.6	
△	0.0	0.0	0.0	0.0	0.3	71.7	28.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	47	19								
□	63	23	0.1215							
△	31	20	0.1336	0.1003	0.0912	0.0763				

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, LEAN CLAY	08/24/2015	CL	42.9
□ Gray, FAT CLAY WITH SAND	08/24/2015	CH	53.2
△ Gray, CLAYEY SAND	08/24/2015	SC	37.0

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-04 **Depth:** 48.00-50.00 **Sample Number:** S-14

□ **Source of Sample:** BH-04 **Depth:** 58.00-60.00 **Sample Number:** S-16

△ **Source of Sample:** BH-04 **Depth:** 68.00-70.00 **Sample Number:** S-18

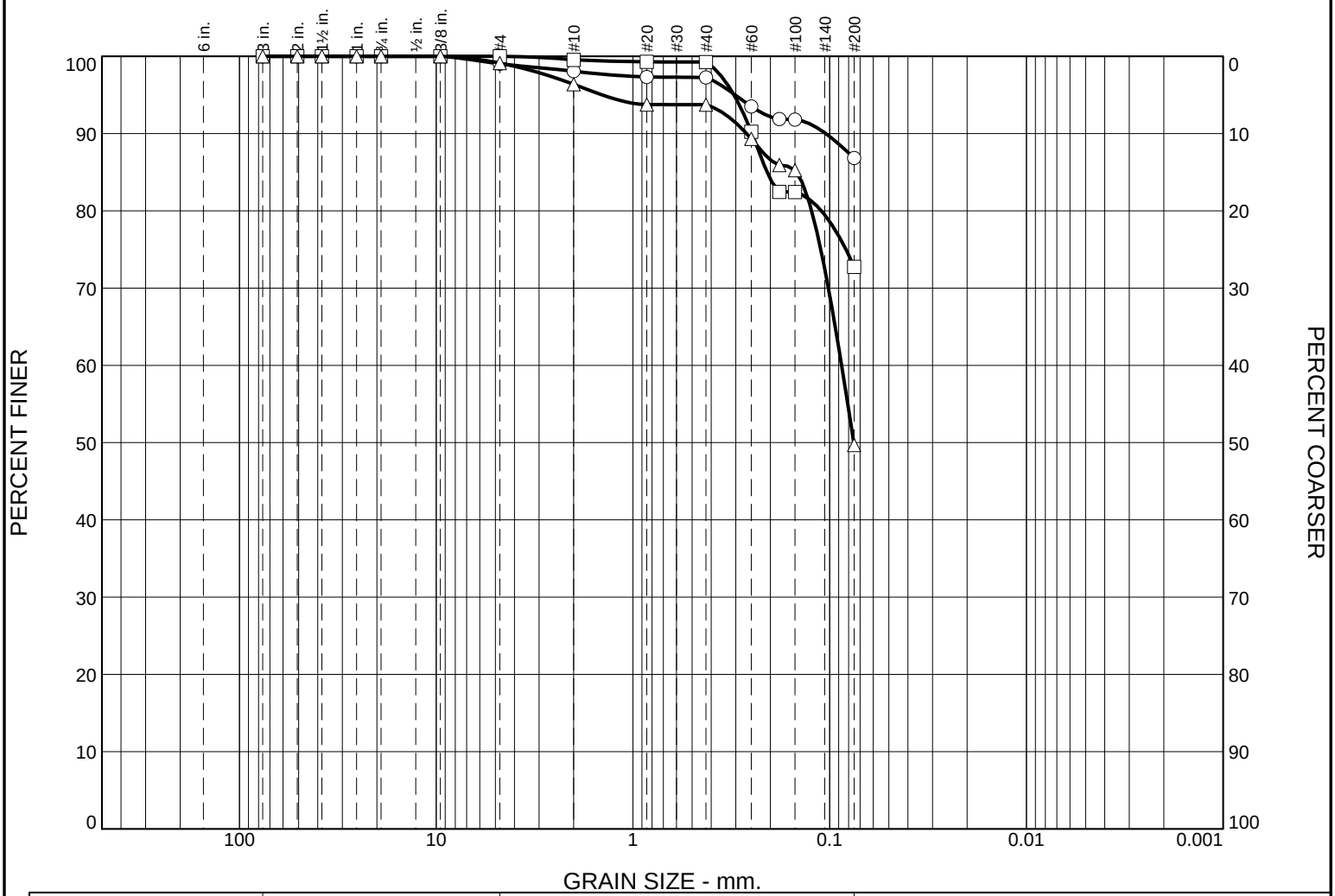
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: ○ tl □ tl △ rjw **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.0	0.9	0.8	10.5	86.8	
□	0.0	0.0	0.0	0.5	0.2	26.5	72.8	
△	0.0	0.0	0.9	2.7	2.7	44.0	49.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	50	23								
□	43	17	0.2079							
△	37	23	0.1472	0.0869	0.0753					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-brown, FAT CLAY	08/24/2015	CH	27.2
□ Orange-brown, LEAN CLAY WITH SAND	08/24/2015	CL	29.9
△ Gray, CLAYEY SAND, contains marine shell fragments	08/24/2015	SC	35.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-05 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-05 **Depth:** 8.00-10.00 **Sample Number:** S-5

△ **Source of Sample:** BH-05 **Depth:** 33.00-35.00 **Sample Number:** S-10

Remarks:

ECS MID-ATLANTIC, LLC
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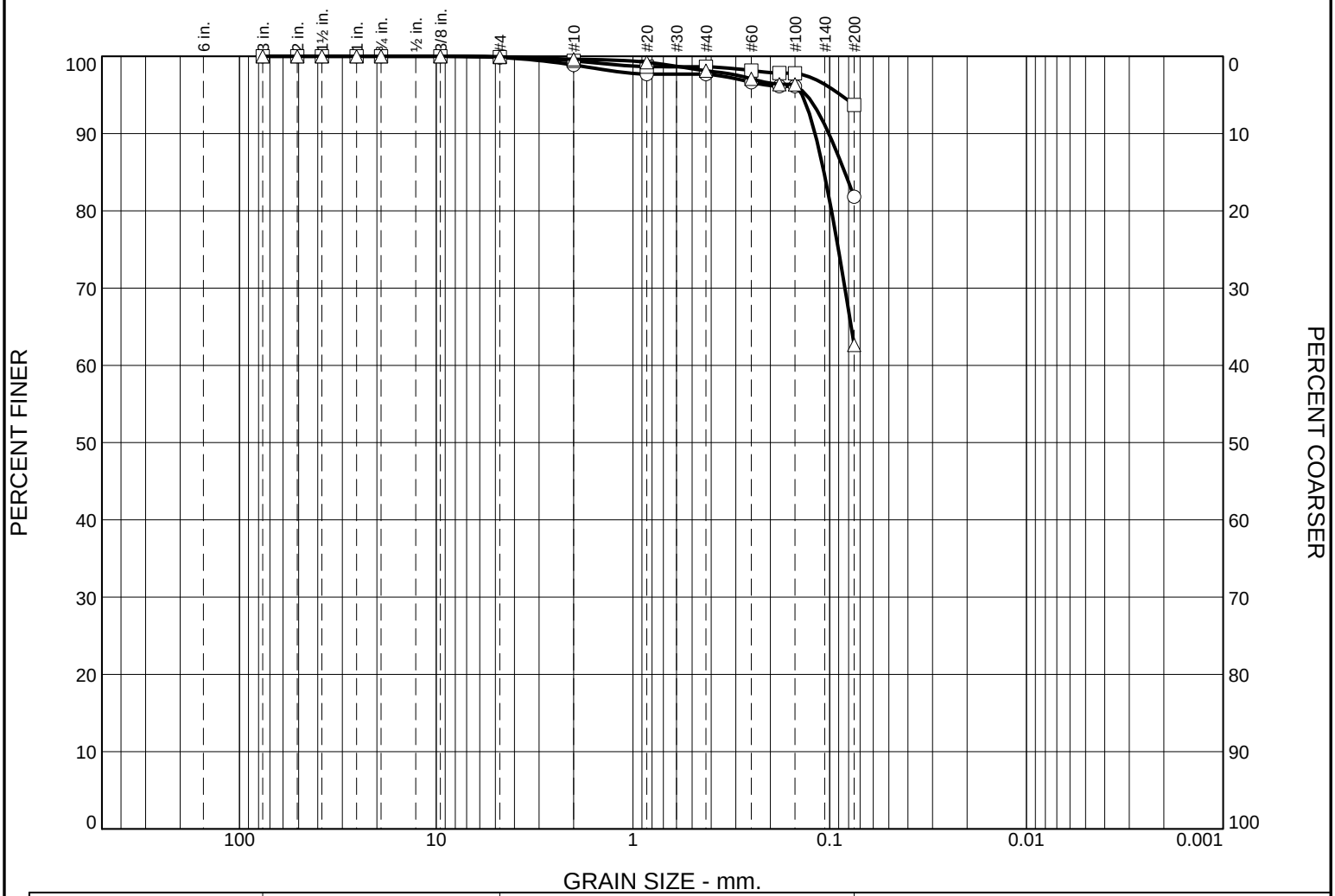
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.9	1.2	15.9	81.8	
□	0.0	0.0	0.1	0.5	0.8	4.9	93.7	
△	0.0	0.0	0.1	0.3	1.5	35.5	62.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	41	25	0.0837							
□	49	27								
△	52	22	0.1068							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, LEAN CLAY WITH SAND	08/24/2015	CL	41.1
□ Gray, LEAN CLAY	08/24/2015	CL	45.5
△ Gray, SANDY FAT CLAY, contains marine shell fragments	08/24/2015	CH	56.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-05 **Depth:** 38.00-40.00 **Sample Number:** S-11

□ **Source of Sample:** BH-05 **Depth:** 48.00-50.00 **Sample Number:** S-13

△ **Source of Sample:** BH-05 **Depth:** 58.00-60.00 **Sample Number:** S-15

Remarks:

ECS MID-ATLANTIC, LLC
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Phone: (757) 366-5100
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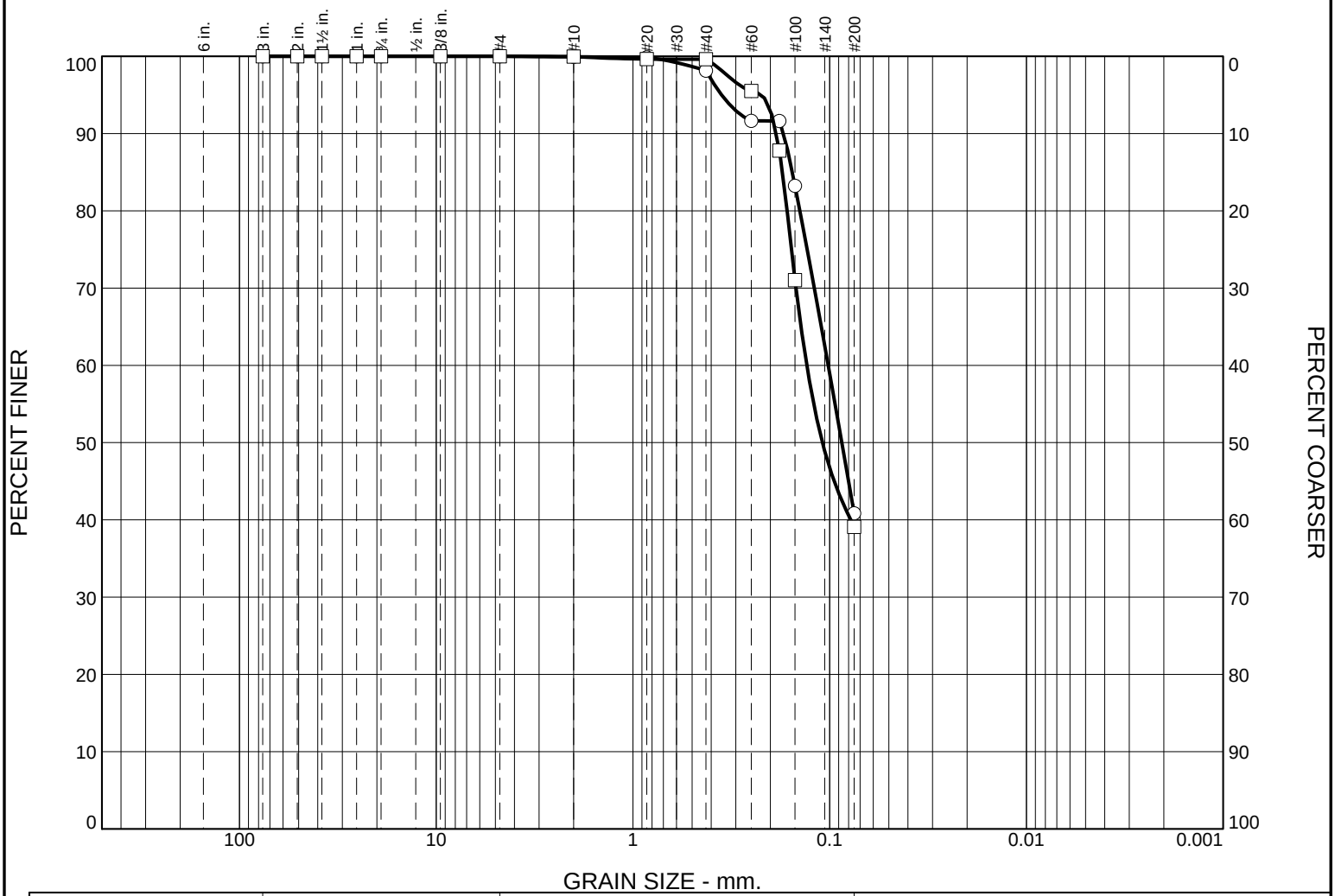
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	1.8	57.3	40.8	
□	0.0	0.0	0.0	0.0	0.4	60.5	39.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31	18	0.1548	0.1016	0.0867					
□	36	15	0.1737	0.1307	0.1088					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, CLAYEY SAND	08/24/2015	SC	38.6
□ Gray, CLAYEY SAND	08/24/2015	SC	41.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-05 **Depth:** 63.00-65.00 **Sample Number:** S-16

□ **Source of Sample:** BH-05 **Depth:** 78.00-80.00 **Sample Number:** S-19

Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
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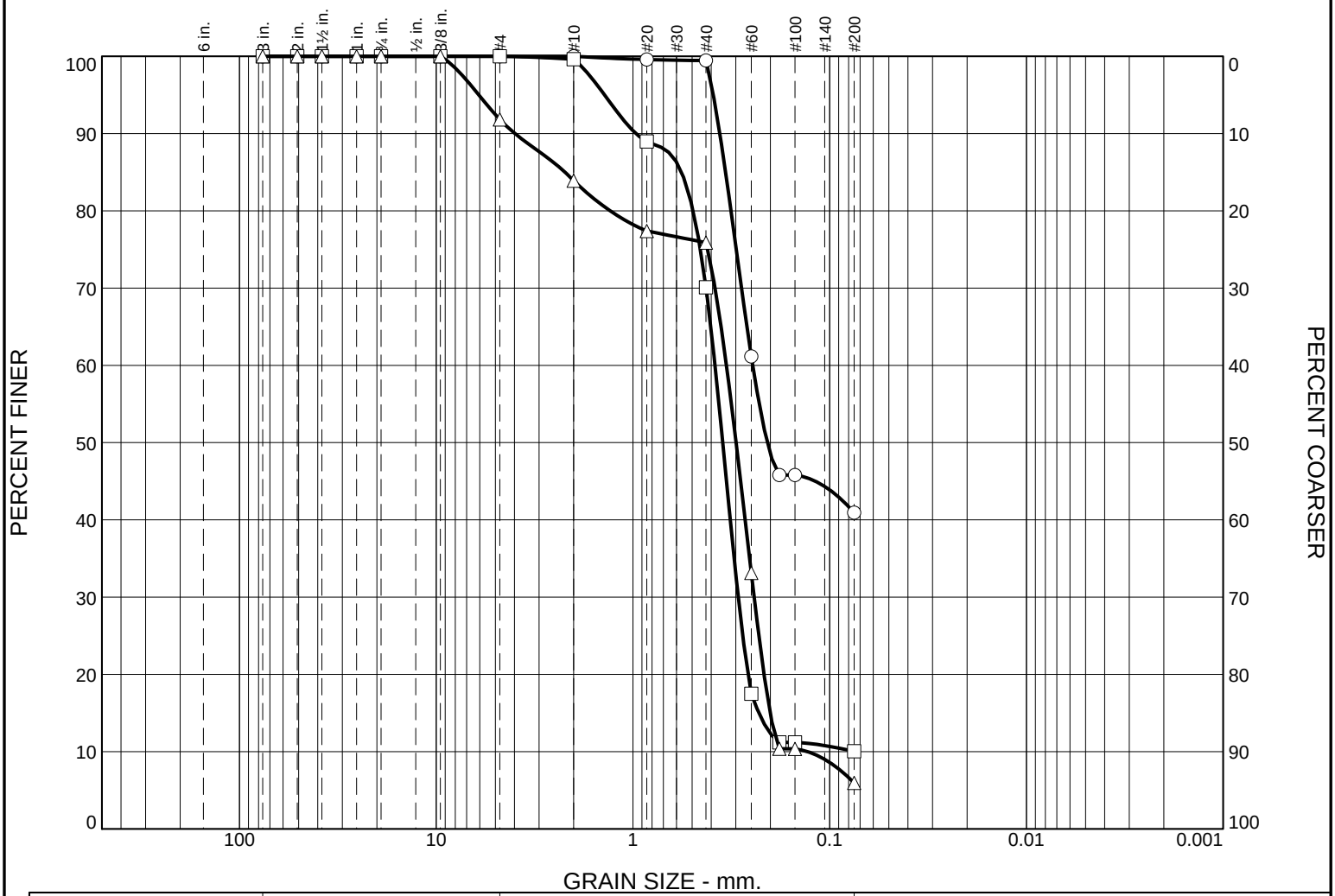
Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.5	58.6	40.9	
□	0.0	0.0	0.0	0.4	29.5	60.0	10.1	
△	0.0	0.0	8.2	7.9	8.0	69.9	6.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	20	15	0.3379	0.2460	0.2073					
□	NP	NP	0.5659	0.3825	0.3494	0.2913	0.2288			
△	NP	NP	2.2130	0.3345	0.2987	0.2418	0.2005	0.1295	1.35	2.58

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown mottled orange, CLAYEY/SILTY SAND	08/24/2015	SC-SM	24.0
□ Orange-brown, POORLY GRADED SAND WITH SILT	08/24/2015	SP-SM	19.5
△ Tan, POORLY GRADED SAND WITH SILT	08/24/2015	SP-SM	19.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-06 **Depth:** 4.00-6.00 **Sample Number:** S-3

□ **Source of Sample:** BH-06 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-06 **Depth:** 18.00-20.00 **Sample Number:** S-7

Remarks:

ECS MID-ATLANTIC, LLC
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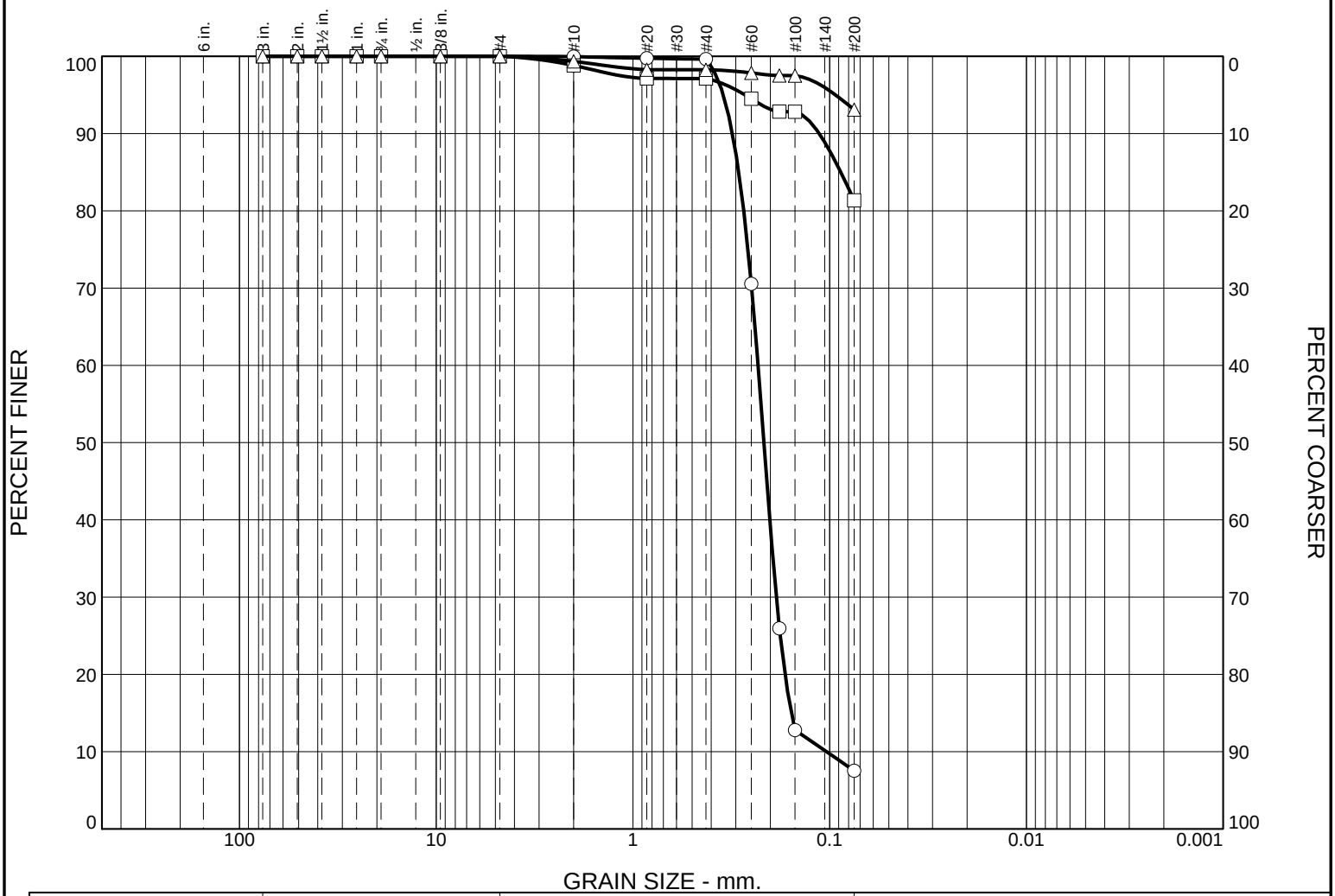
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	92.1	7.5	
□	0.0	0.0	0.0	1.2	1.7	15.7	81.4	
△	0.0	0.0	0.0	0.7	1.0	5.2	93.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.2895	0.2310	0.2157	0.1866	0.1565	0.1037	1.45	2.23
□	41	23	0.0877							
△	48	22								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan, POORLY GRADED SAND WITH SILT	08/24/2015	SP-SM	24.2
□ Gray, LEAN CLAY WITH SAND, contains marine shell fragments	08/24/2015	CL	39.4
△ Gray, LEAN CLAY	10/05/2015	CL	42.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-06 **Depth:** 33.00-35.00 **Sample Number:** S-10

□ **Source of Sample:** BH-06 **Depth:** 43.00-45.00 **Sample Number:** S-12

△ **Source of Sample:** BH-06 **Depth:** 45.00-47.00 **Sample Number:** S-13

Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
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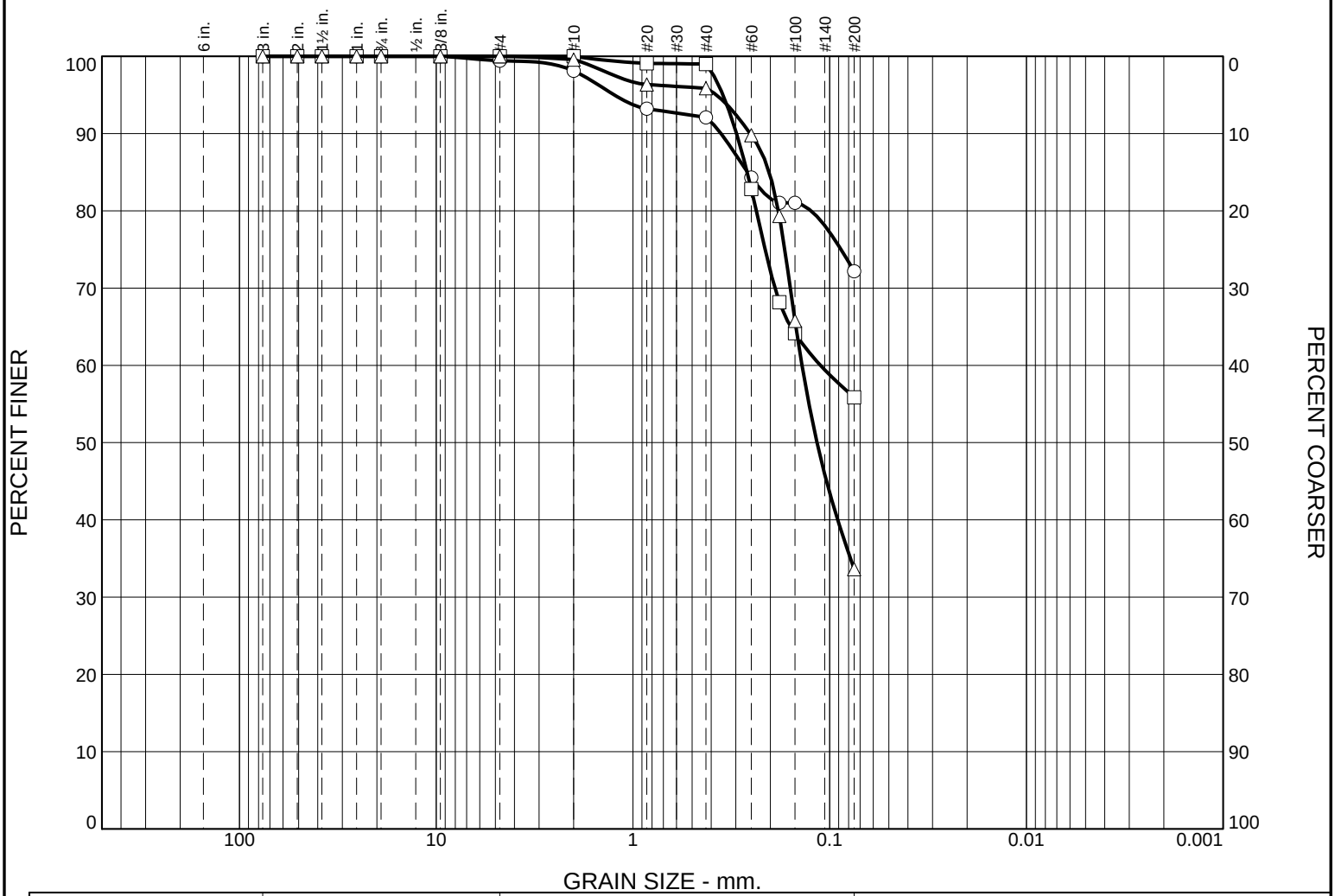
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: ○ tl □ tl △ hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	1.3	6.0	19.9	72.2	
□	0.0	0.0	0.0	0.0	1.0	43.1	55.9	
△	0.0	0.0	0.0	0.4	3.7	62.3	33.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	57	30	0.2614							
□	53	21	0.2624	0.1114						
△	45	24	0.2027	0.1382	0.1159					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, FAT CLAY WITH SAND	08/24/2015	CH	48.1
□ Gray, SANDY FAT CLAY	08/24/2015	CH	39.4
△ Gray, CLAYEY SAND	08/24/2015	SC	42.3

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-06 **Depth:** 48.00-50.00 **Sample Number:** S-14

□ **Source of Sample:** BH-06 **Depth:** 53.00-55.00 **Sample Number:** S-15

△ **Source of Sample:** BH-06 **Depth:** 78.00-80.00 **Sample Number:** S-20

Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
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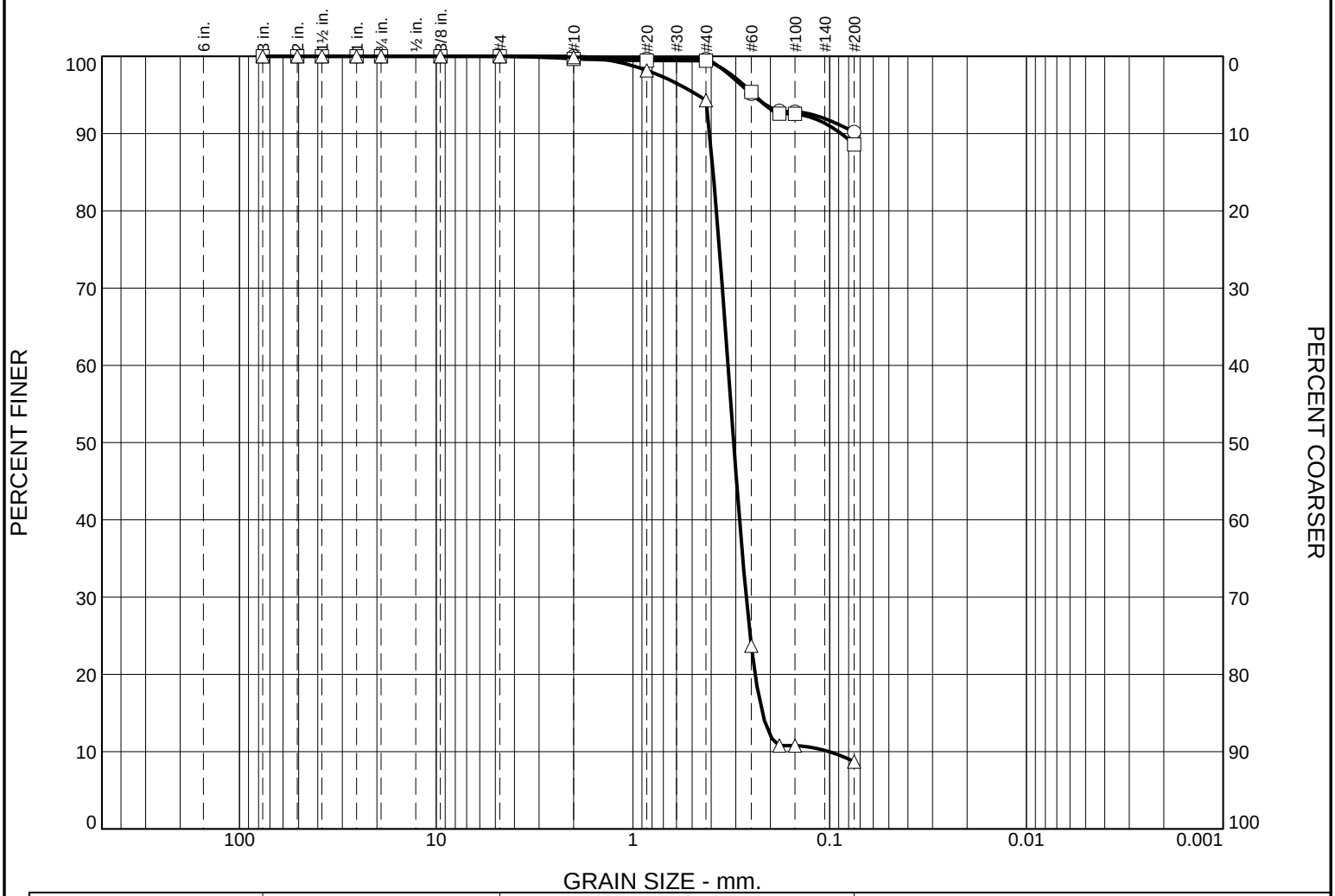
Fax: (757) 366-5203

Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.3	9.5	90.2	
□	0.0	0.0	0.0	0.3	0.3	10.8	88.6	
△	0.0	0.0	0.0	0.1	5.6	85.6	8.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○										
□	50	23								
△	NP	NP	0.3910	0.3284	0.3074	0.2654	0.2196	0.1006	2.13	3.26

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, FAT CLAY	10/05/2015	CH	28.0
□ Gray mottled orange, FAT CLAY	10/05/2015	CH	28.7
△ Light tan, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	22.3

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-07 **Depth:** 4.00-6.00 **Sample Number:** S-3

□ **Source of Sample:** BH-07 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-07 **Depth:** 18.0-20.0 **Sample Number:** S-7

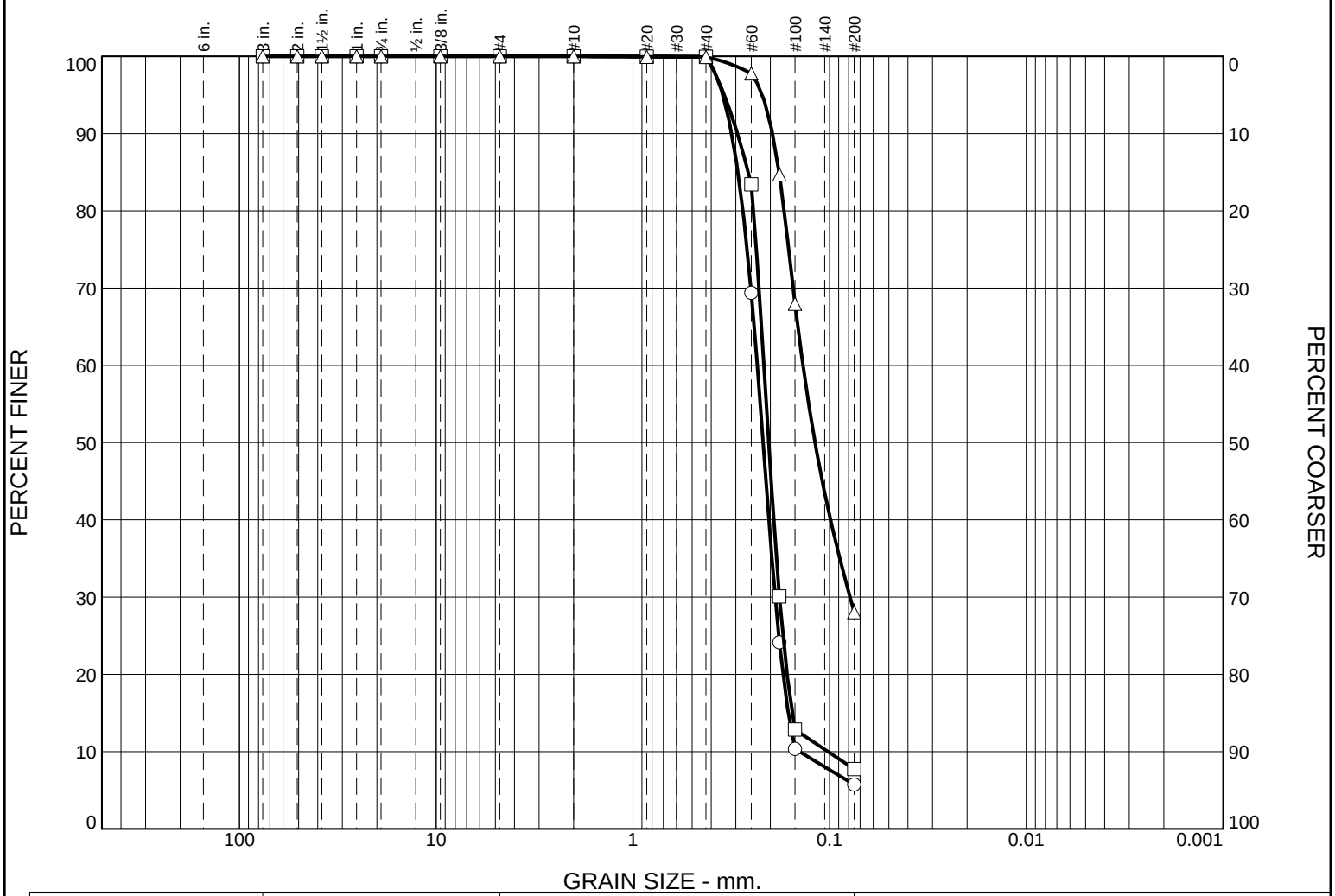
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	94.3	5.7	
□	0.0	0.0	0.0	0.0	0.1	92.2	7.7	
△	0.0	0.0	0.0	0.0	0.1	71.8	28.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.2924	0.2331	0.2177	0.1891	0.1622	0.1423	1.08	1.64
□	NP	NP	0.2592	0.2157	0.2039	0.1799	0.1548	0.1018	1.47	2.12
△	25	19	0.1807	0.1366	0.1186	0.0787				

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Yellow-tan, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	24.4
□ Yellow-tan, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	25.1
△ Gray, CLAYEY/SILTY SAND	10/05/2015	SC-SM	38.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-07 **Depth:** 33.0-35.0 **Sample Number:** S-10

□ **Source of Sample:** BH-07 **Depth:** 43.0-45.0 **Sample Number:** S-12

△ **Source of Sample:** BH-07 **Depth:** 63.0-65.0 **Sample Number:** S-16

Remarks:

ECS MID-ATLANTIC, LLC
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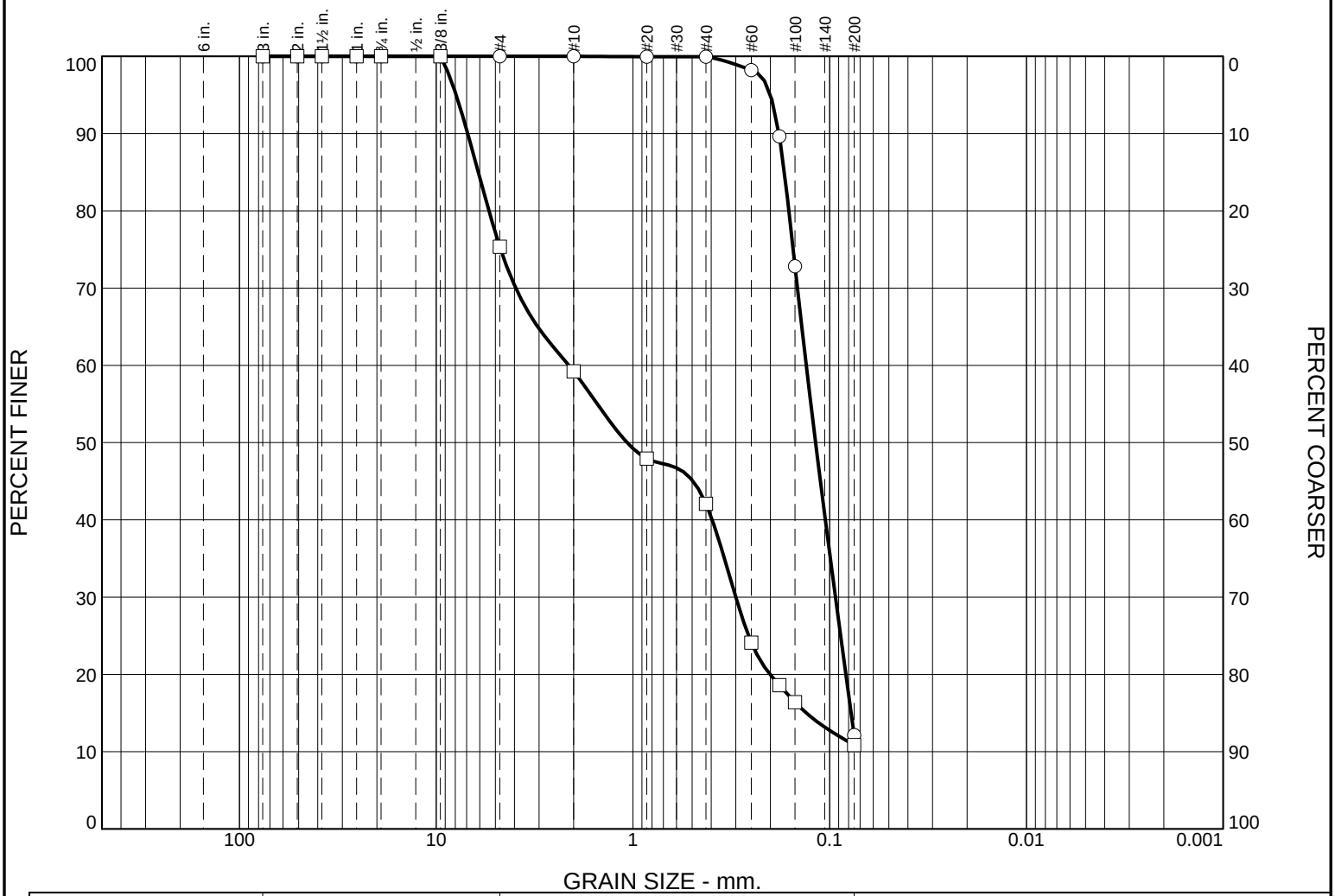
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	87.8	12.1	
□	0.0	0.0	24.7	16.1	17.1	31.2	10.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.1698	0.1315	0.1179	0.0934	0.0777			
□	NP	NP	6.1053	2.1170	1.0695	0.2997	0.1312			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SILTY SAND	10/05/2015	SM	29.5
□ Gray, POORLY GRADED SAND WITH SILT	09/01/2015	SP-SM	9.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-07 **Depth:** 73.0-75.0 **Sample Number:** S-18

□ **Source of Sample:** BH-07 **Depth:** 78.0-80.0 **Sample Number:** S-19

Remarks:

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Virginia Beach, VA 23452
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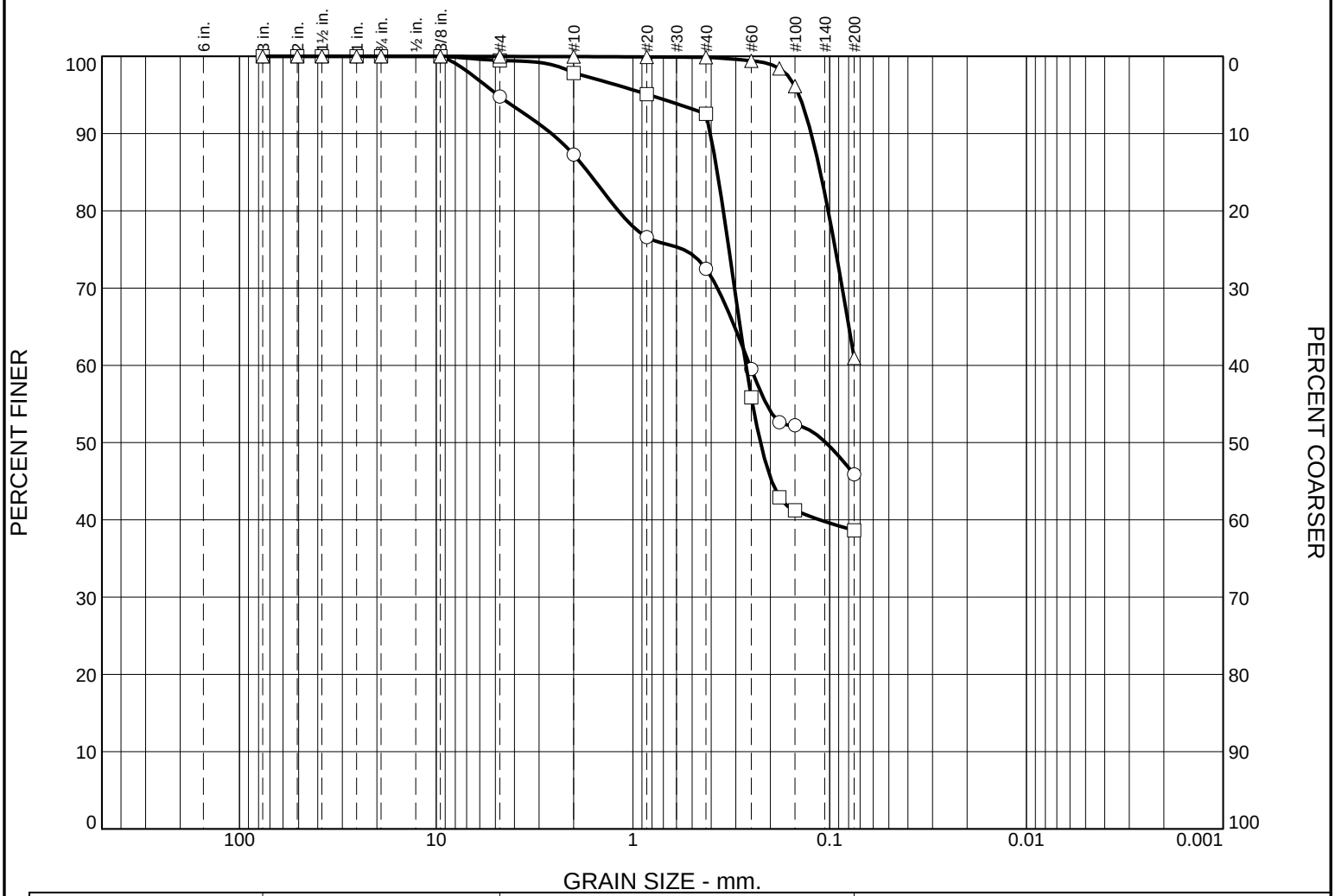
Figure

Tested By: ○ HMR □ hmr **Checked By:** RJW

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.2	7.5	14.8	26.6	45.9	
□	0.0	0.0	0.5	1.7	5.2	54.0	38.6	
△	0.0	0.0	0.0	0.0	0.1	39.0	60.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			1.6864	0.2543	0.1045					
□	73	29	0.3723	0.2662	0.2246					
△	33	24	0.1115							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown-gray, CLAYEY SAND, contains root fragments	10/05/2015	SC	69.3
□ Brown-gray, CLAYEY SAND	10/05/2015	SC	46.8
△ Gray, SANDY LEAN CLAY	10/05/2015	CL	31.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-09 **Depth:** 4.00-6.00 **Sample Number:** S-3

□ **Source of Sample:** BH-09 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-09 **Depth:** 33.00-35.00 **Sample Number:** S-10

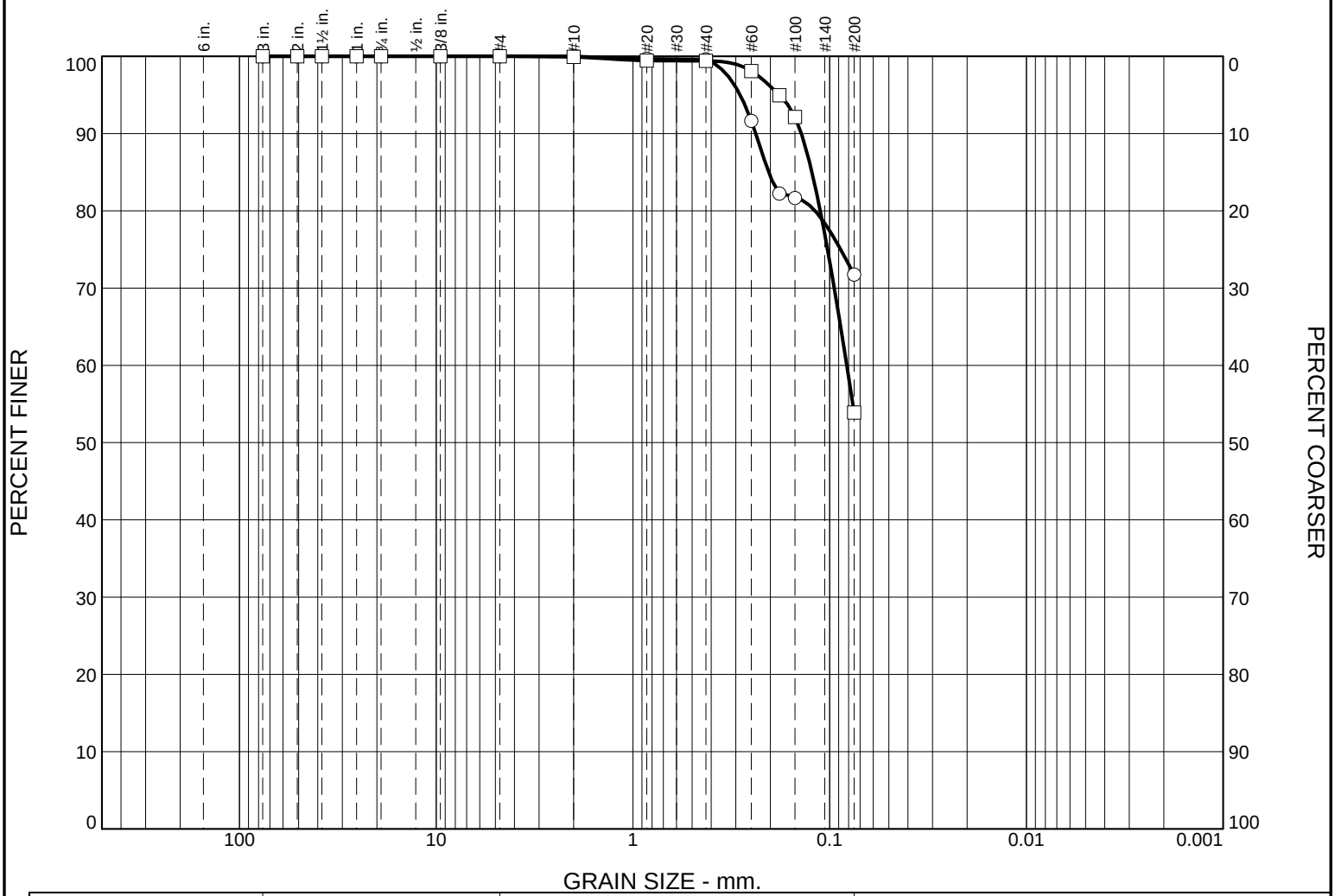
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: ○ tl □ hmr △ hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	27.9	71.7	
□	0.0	0.0	0.0	0.1	0.5	45.5	53.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	35	22	0.2040							
□	35	24	0.1230	0.0818						

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan-orange, LEAN CLAY WITH SAND	09/01/2015	CL	24.9
□ Gray, SANDY LEAN CLAY	09/01/2015	CL	36.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-10 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-10 **Depth:** 48.00-50.00 **Sample Number:** S-13

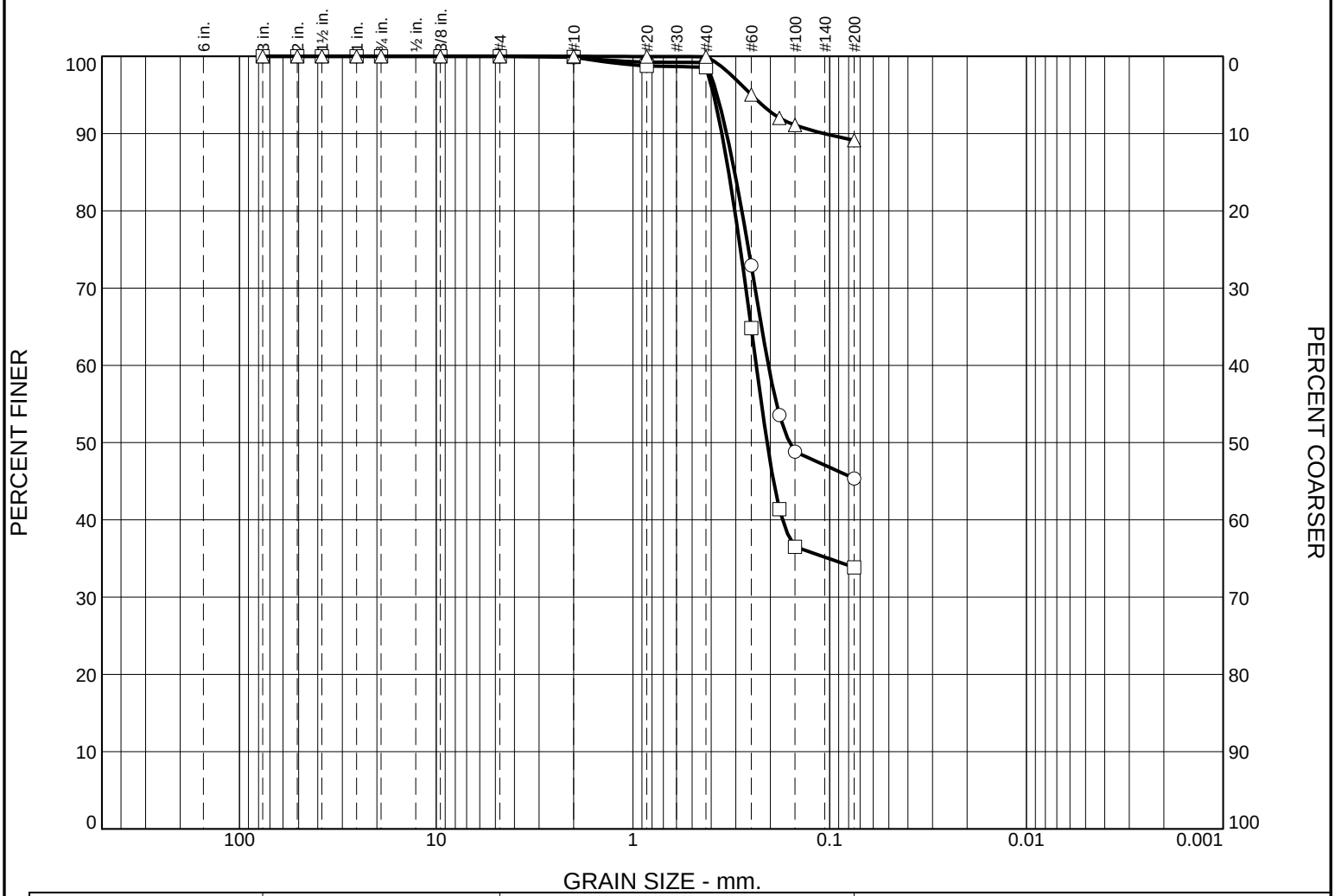
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.7	53.8	45.4	
□	0.0	0.0	0.0	0.1	1.3	64.7	33.9	
△	0.0	0.0	0.0	0.0	0.0	10.9	89.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3039	0.2047	0.1595					
□			0.3258	0.2359	0.2078					
△	49	23								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray-orange, CLAYEY SAND	09/05/2015	SC	8.8
□ Gray-orange, CLAYEY SAND	09/05/2015	SC	11.5
△ Gray, LEAN CLAY	09/05/2015	CL	23.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-11 **Depth:** 4.00-6.00 **Sample Number:** S-3

□ **Source of Sample:** BH-11 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-11 **Depth:** 18.00-20.00 **Sample Number:** S-7

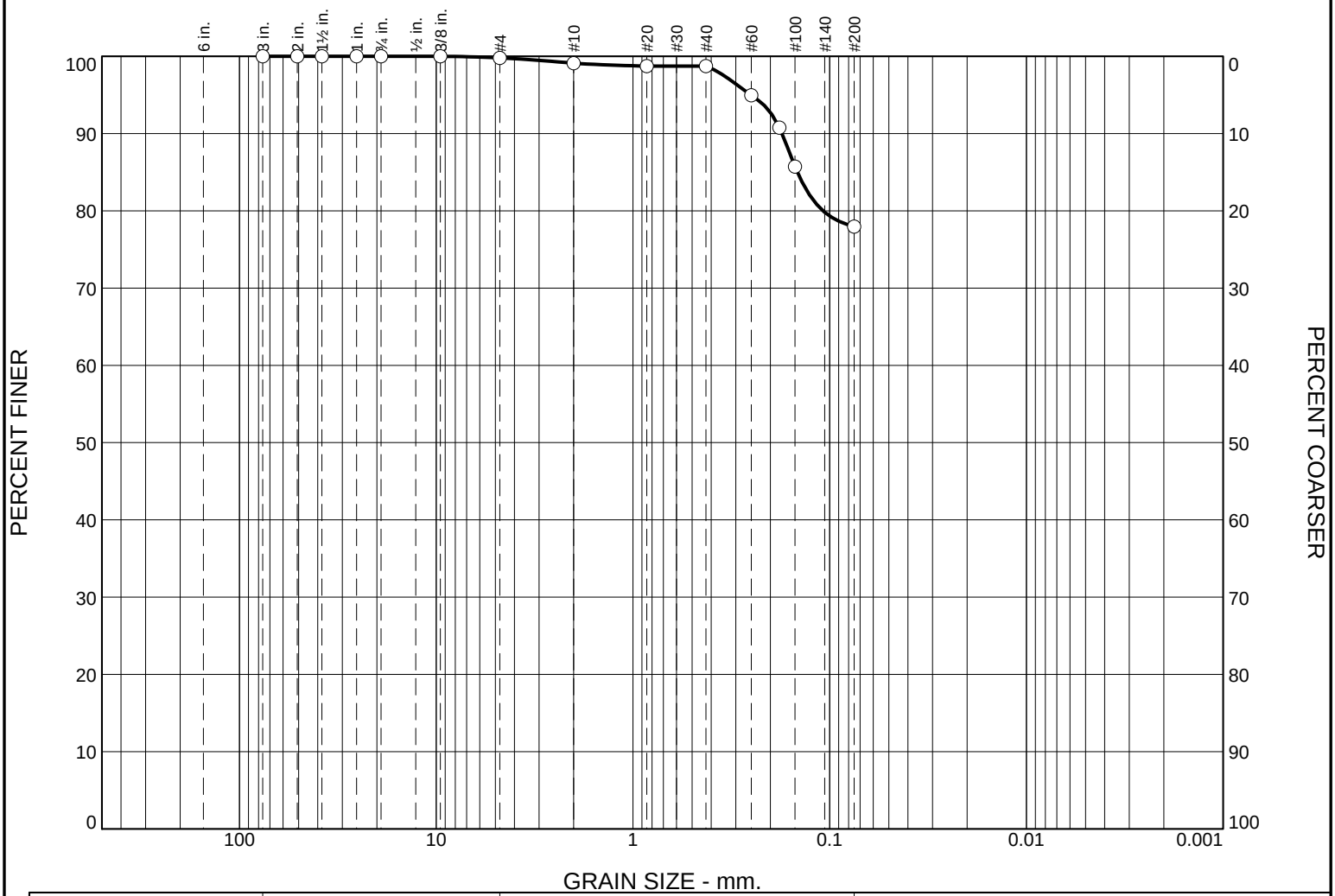
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	0.7	0.4	20.7	78.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1459							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, LEAN CLAY WITH SAND	09/05/2015	CL	30.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-11 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

ECS MID-ATLANTIC, LLC
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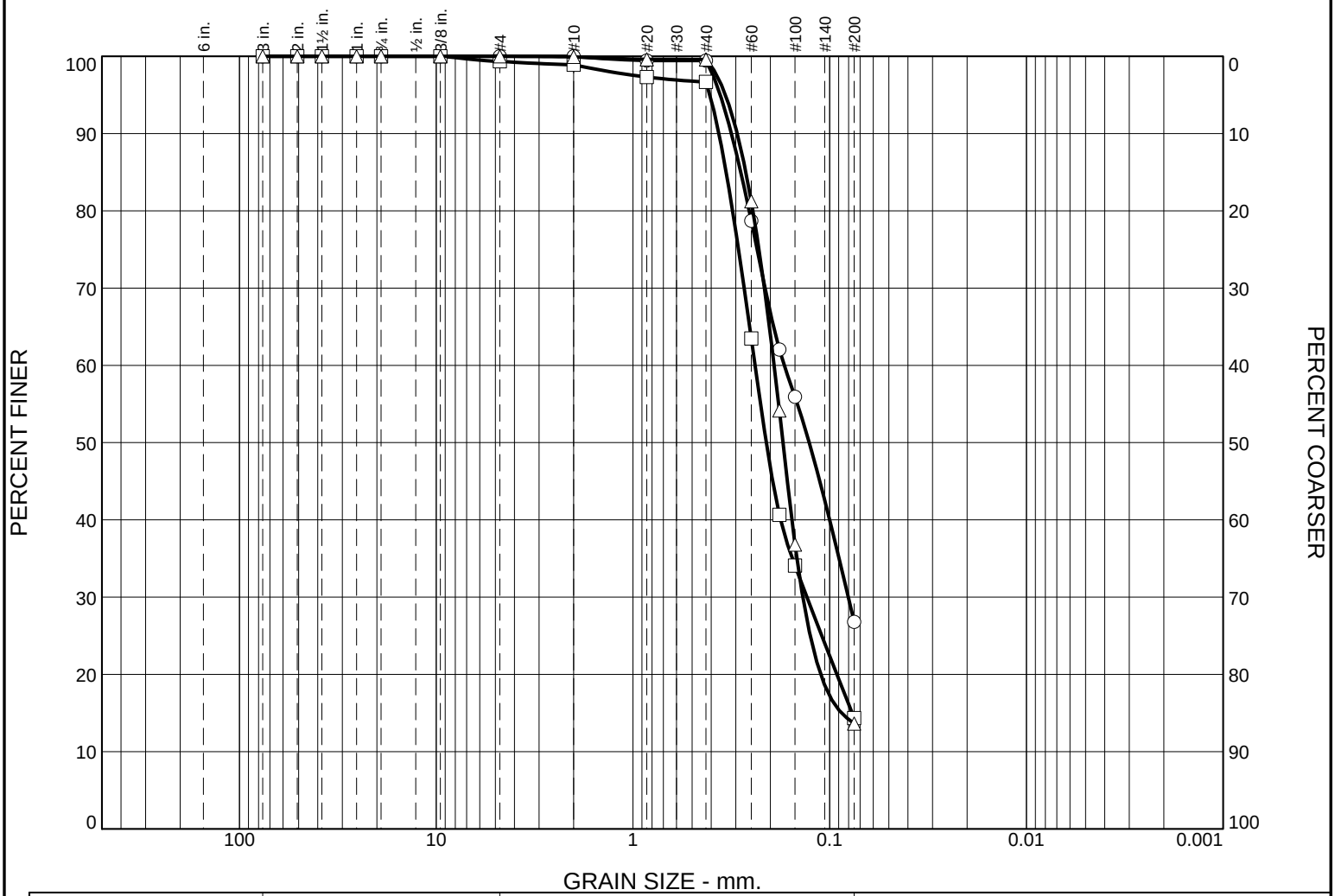
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.6	72.6	26.8	
□	0.0	0.0	0.6	0.5	2.2	82.4	14.3	
△	0.0	0.0	0.0	0.1	0.3	86.0	13.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	21	18	0.2827	0.1702	0.1270	0.0803				
□	NP	NP	0.3355	0.2392	0.2098	0.1305	0.0768			
△	NP	NP	0.2664	0.1914	0.1726	0.1369	0.0869			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan, SILTY SAND	09/15/2015	SM	20.0
□ Light-brown, SILTY SAND	09/14/2015	SM	14.6
△ Gray, SILTY SAND	09/14/2015	SM	22.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-13 **Depth:** 2.00-4.00 **Sample Number:** S-2

□ **Source of Sample:** BH-13 **Depth:** 6.00-8.00 **Sample Number:** S-4

△ **Source of Sample:** BH-13 **Depth:** 18.00-20.00 **Sample Number:** S-7

Remarks:

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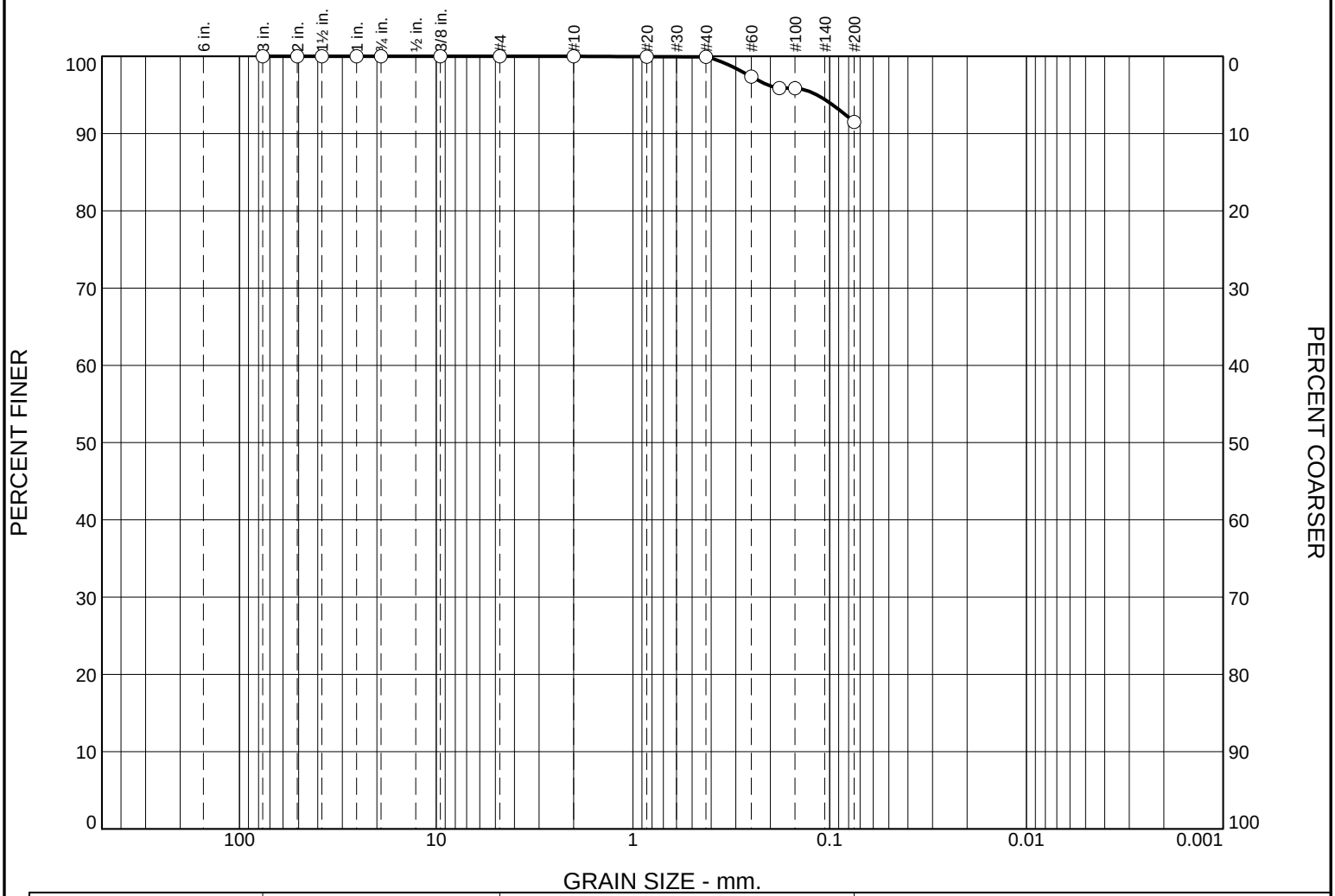
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	8.4	91.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	38	24								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan mottled orange, LEAN CLAY	09/14/2015	CL	24.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-13 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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Virginia Beach, VA 23452
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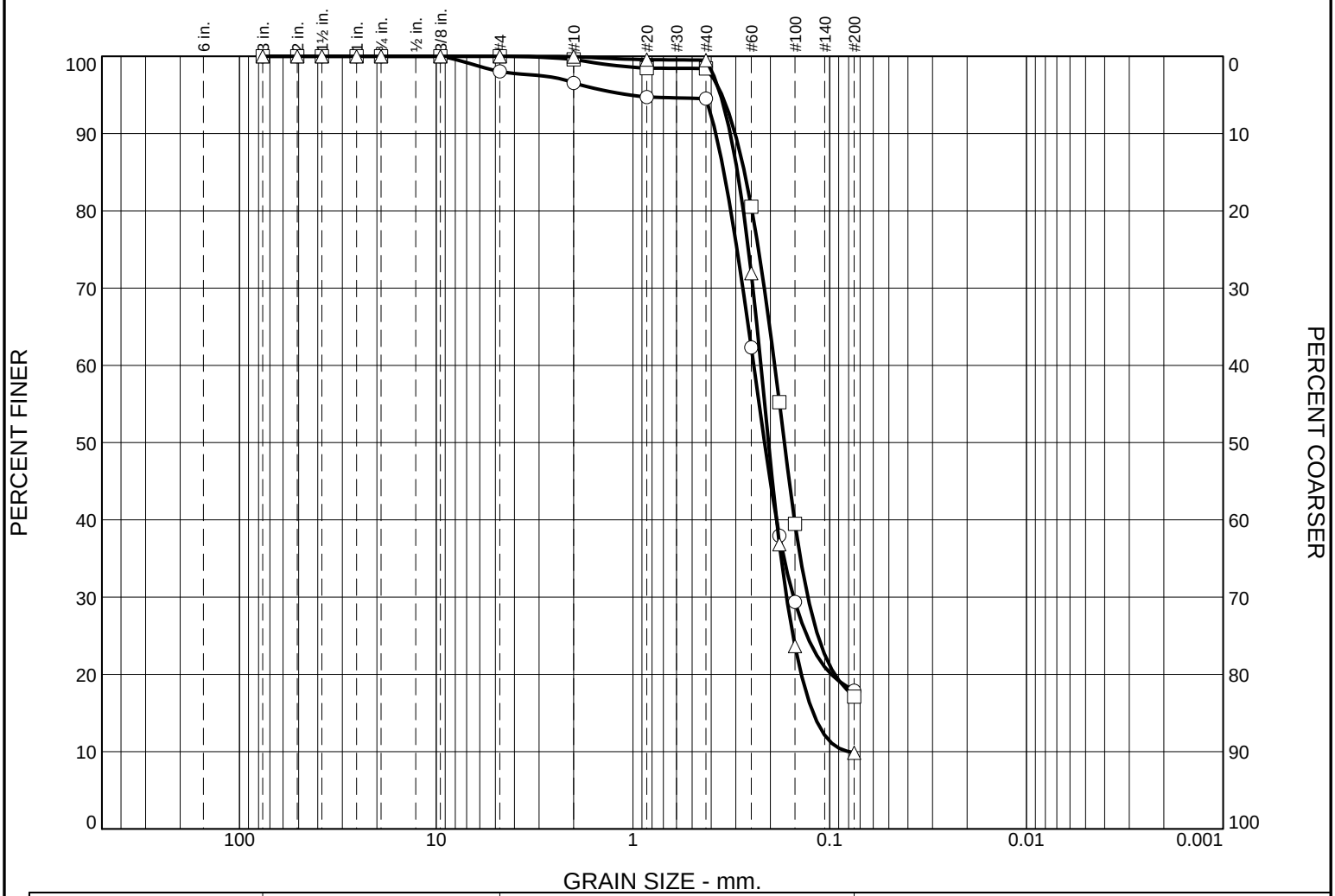
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.0	1.5	2.0	76.6	17.9	
□	0.0	0.0	0.0	0.4	1.2	81.3	17.1	
△	0.0	0.0	0.0	0.0	0.5	89.6	9.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3445	0.2428	0.2141	0.1525				
□	NP	NP	0.2707	0.1901	0.1698	0.1290				
△	NP	NP	0.2937	0.2234	0.2044	0.1656	0.1213	0.0799	1.54	2.79

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan to gray, SILTY SAND	10/01/2015	SM	8.4
□ Gray-tan, SILTY SAND, contains marine shell fragments	10/01/2015	SM	18.4
△ Gray, POORLY GRADED SAND WITH SILT	10/01/2015	SP-SM	18.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-15 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-15 **Depth:** 18.00-20.00 **Sample Number:** S-7

△ **Source of Sample:** BH-15 **Depth:** 33.00-35.00 **Sample Number:** S-10

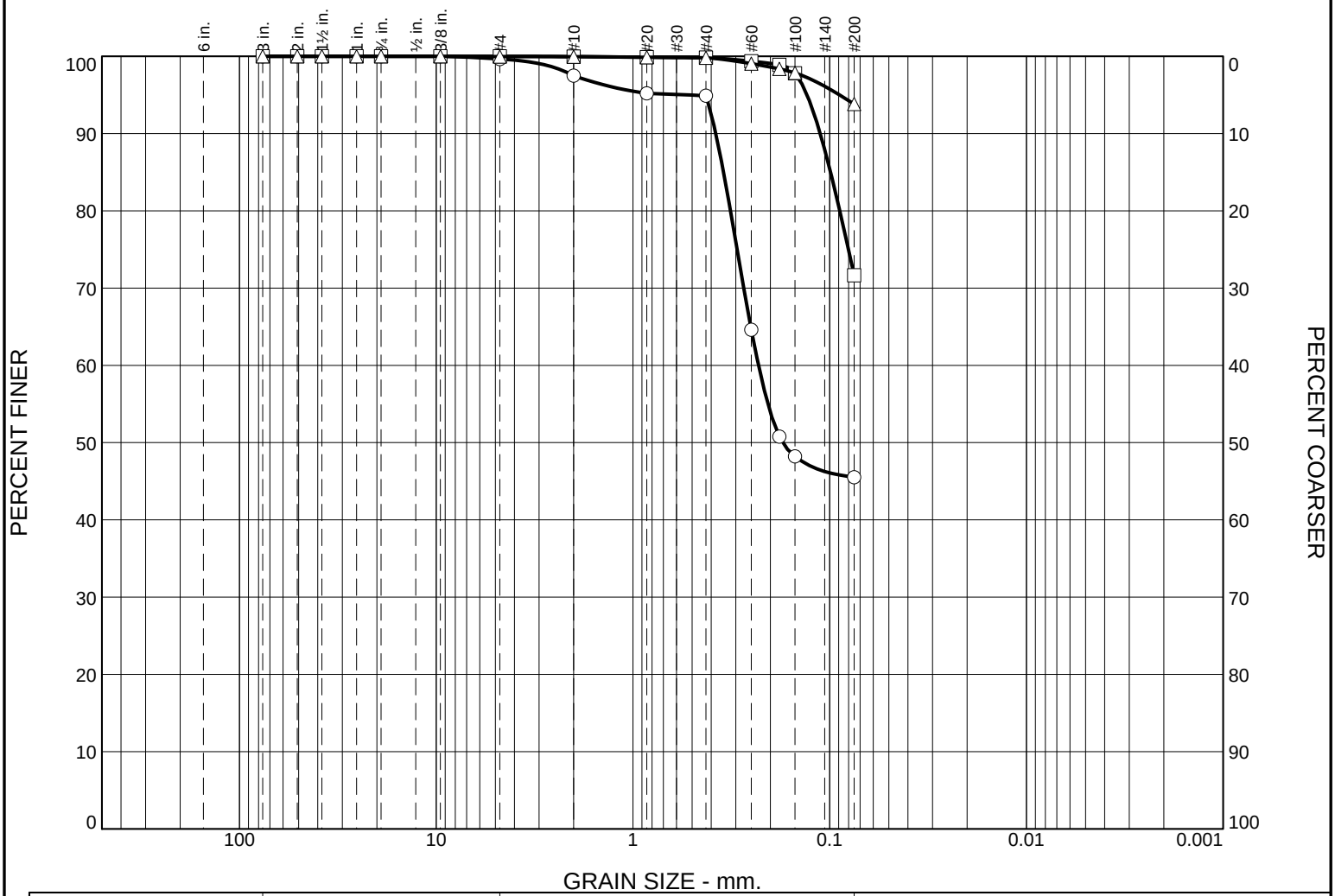
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: tl **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.4	2.1	2.6	49.4	45.5	
□	0.0	0.0	0.0	0.0	0.2	28.1	71.7	
△	0.0	0.0	0.0	0.0	0.2	6.0	93.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3461	0.2298	0.1732					
□	35	21	0.0989							
△	78	33								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, CLAYEY SAND	10/01/2015	SC	18.3
□ Gray, LEAN CLAY WITH SAND	10/01/2015	CL	35.7
△ Gray, FAT CLAY, contains marine shell fragments	10/01/2015	CH	59.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-18 **Depth:** 8.00-10.00 **Sample Number:** S-5

□ **Source of Sample:** BH-18 **Depth:** 43.00-45.00 **Sample Number:** S-12

△ **Source of Sample:** BH-18 **Depth:** 63.00-65.00 **Sample Number:** S-16

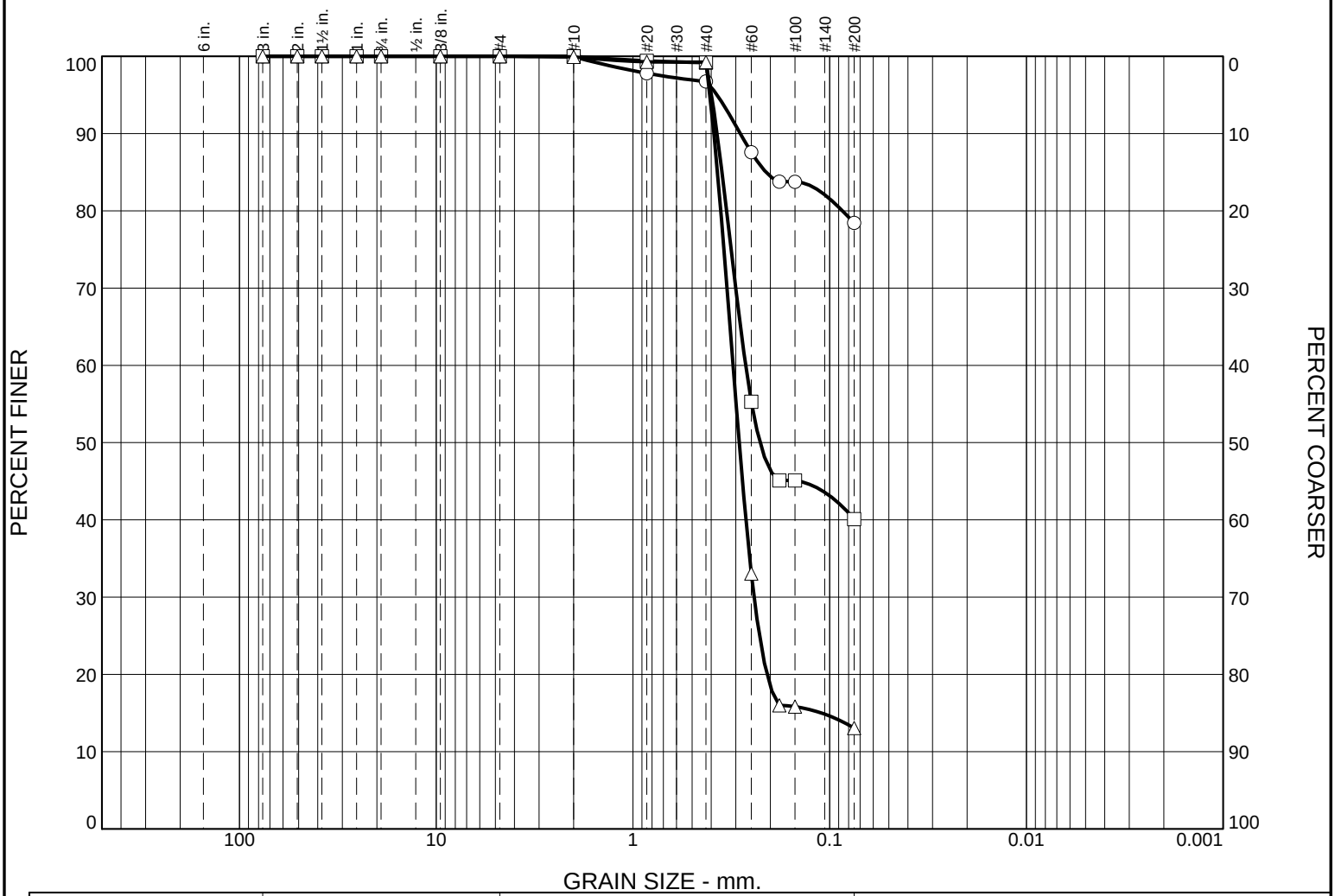
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	3.2	18.3	78.4	
□	0.0	0.0	0.0	0.0	0.8	59.1	40.1	
△	0.0	0.0	0.0	0.1	0.7	86.1	13.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	58	30	0.2107							
□	21	18	0.3525	0.2671	0.2258					
△	NP	NP	0.3716	0.3096	0.2880	0.2421	0.1099			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown mottled orange, FAT CLAY WITH SAND	09/11/2015	CH	28.0
□ Orange-brown, SILTY SAND	09/11/2015	SM	16.8
△ Orange-brown, SILTY SAND	09/11/2015	SM	24.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-20 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-20 **Depth:** 8.00-10.00 **Sample Number:** S-5

△ **Source of Sample:** BH-20 **Depth:** 28.00-30.00 **Sample Number:** S-9

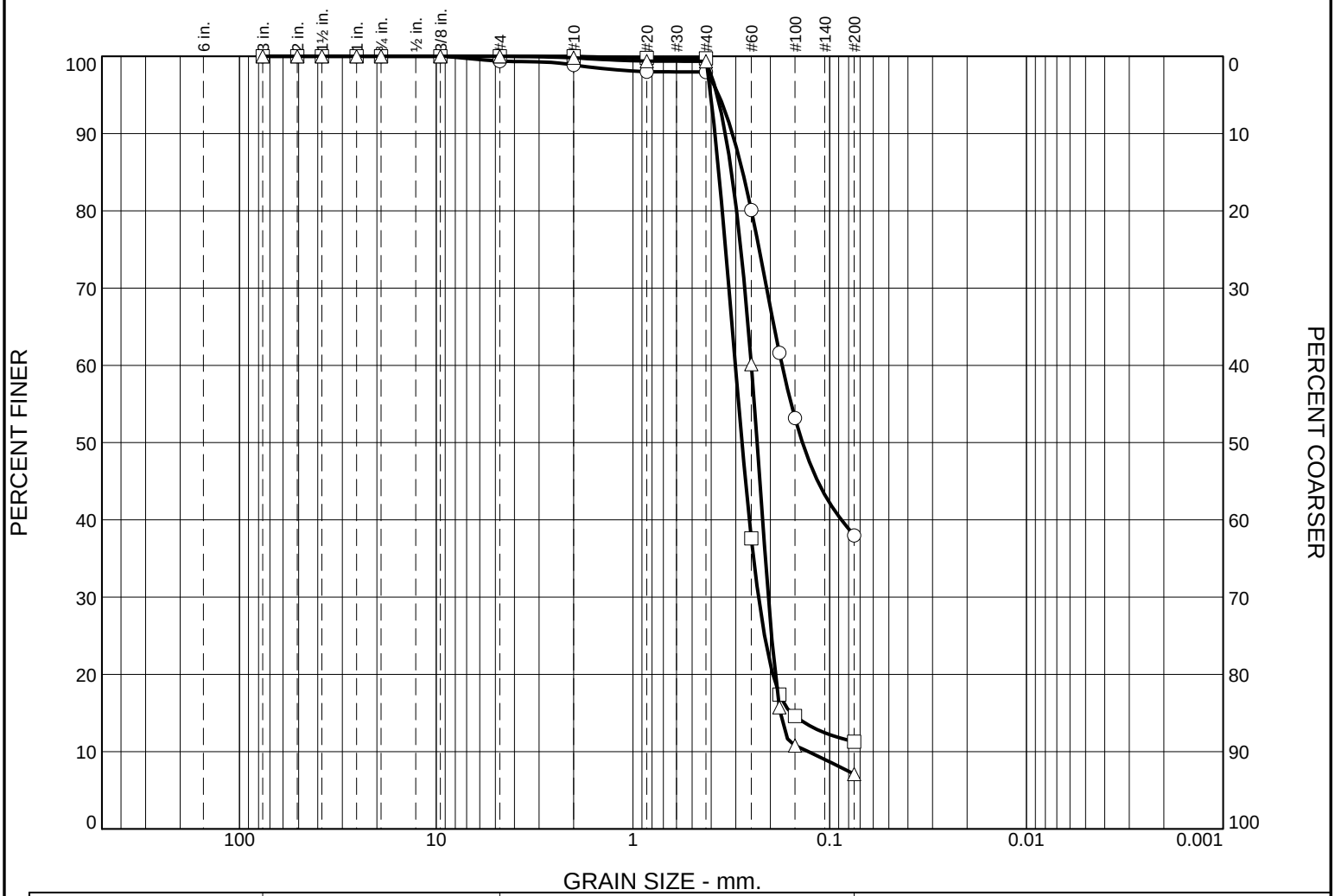
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	0.5	0.9	60.0	38.0	
□	0.0	0.0	0.0	0.0	0.3	88.4	11.3	
△	0.0	0.0	0.0	0.2	0.4	92.3	7.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	22	16	0.2763	0.1744	0.1375					
□	NP	NP	0.3661	0.3013	0.2787	0.2298	0.1562			
△	NP	NP	0.3151	0.2497	0.2335	0.2048	0.1781	0.1281	1.31	1.95

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan, CLAYEY/SILTY SAND	09/17/15	SC-SM	15.1
□ Light Tan, POORLY GRADED SAND WITH SILT	09/17/2015	SP-SM	20.4
△ Light tan, POORLY GRADED SAND WITH SILT	09/15/2015	SP-SM	21.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-22 **Depth:** 8.00-10.00 **Sample Number:** S-5

□ **Source of Sample:** BH-22 **Depth:** 23.00-25.00 **Sample Number:** S-8

△ **Source of Sample:** BH-22 **Depth:** 33.00-35.00 **Sample Number:** S-10

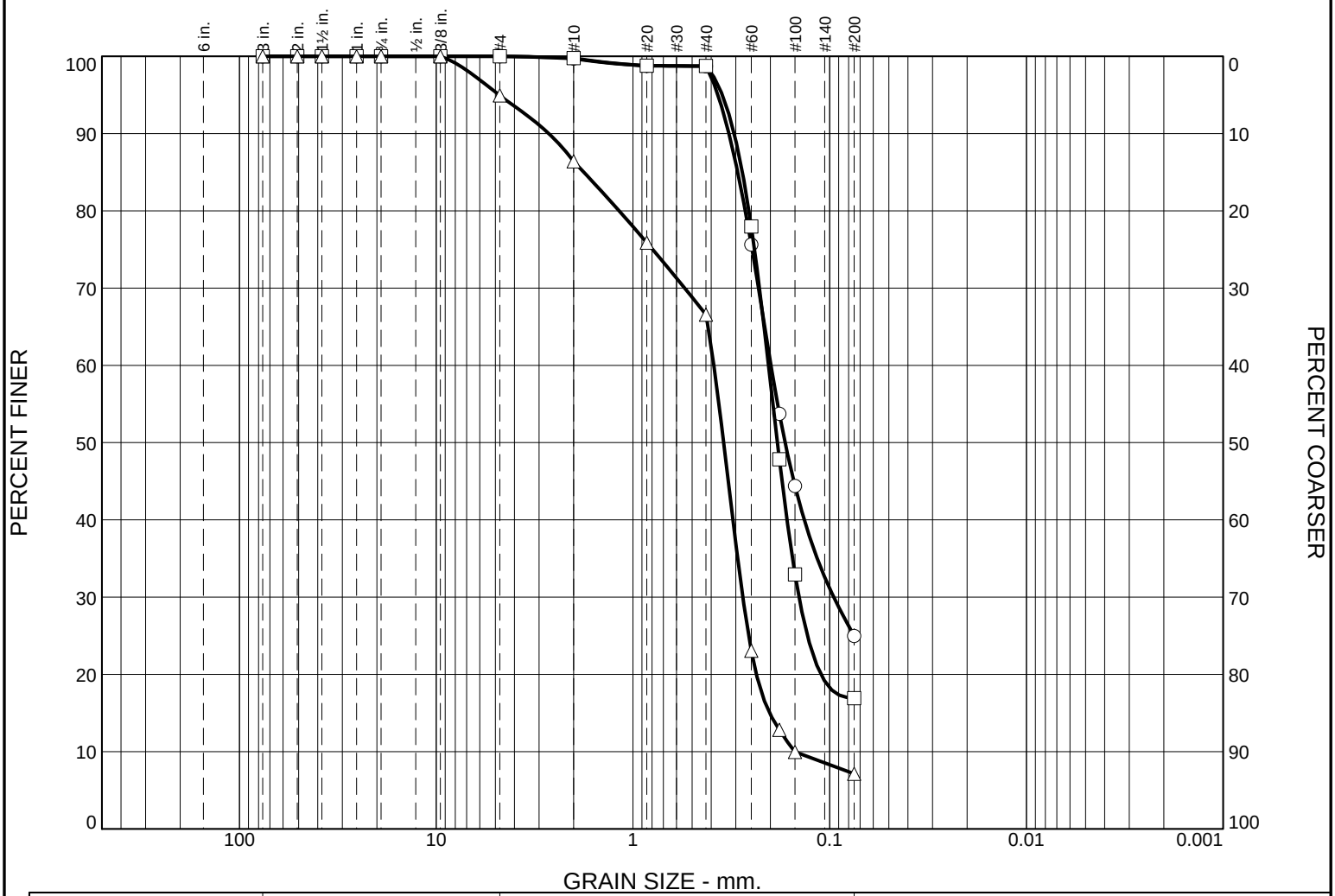
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.3	1.0	73.7	25.0	
□	0.0	0.0	0.0	0.2	1.1	81.8	16.9	
△	0.0	0.0	5.1	8.5	19.8	59.5	7.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.2932	0.1987	0.1685	0.0953				
□	NP	NP	0.2774	0.2044	0.1842	0.1432				
△	NP	NP	1.7752	0.3878	0.3456	0.2761	0.2018	0.1504	1.31	2.58

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SILTY SAND	09/17/2015	SM	11.2
□ Gray, SILTY SAND	09/17/2015	SM	27.9
△ Gray, POORLY GRADED SAND WITH SILT	09/17/2015	SP-SM	16.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-24 **Depth:** 23.00-25.00 **Sample Number:** S-8

□ **Source of Sample:** BH-24 **Depth:** 43.0-45.0 **Sample Number:** S-12

△ **Source of Sample:** BH-24 **Depth:** 48.0-50.0 **Sample Number:** S-13

Remarks:

ECS MID-ATLANTIC, LLC
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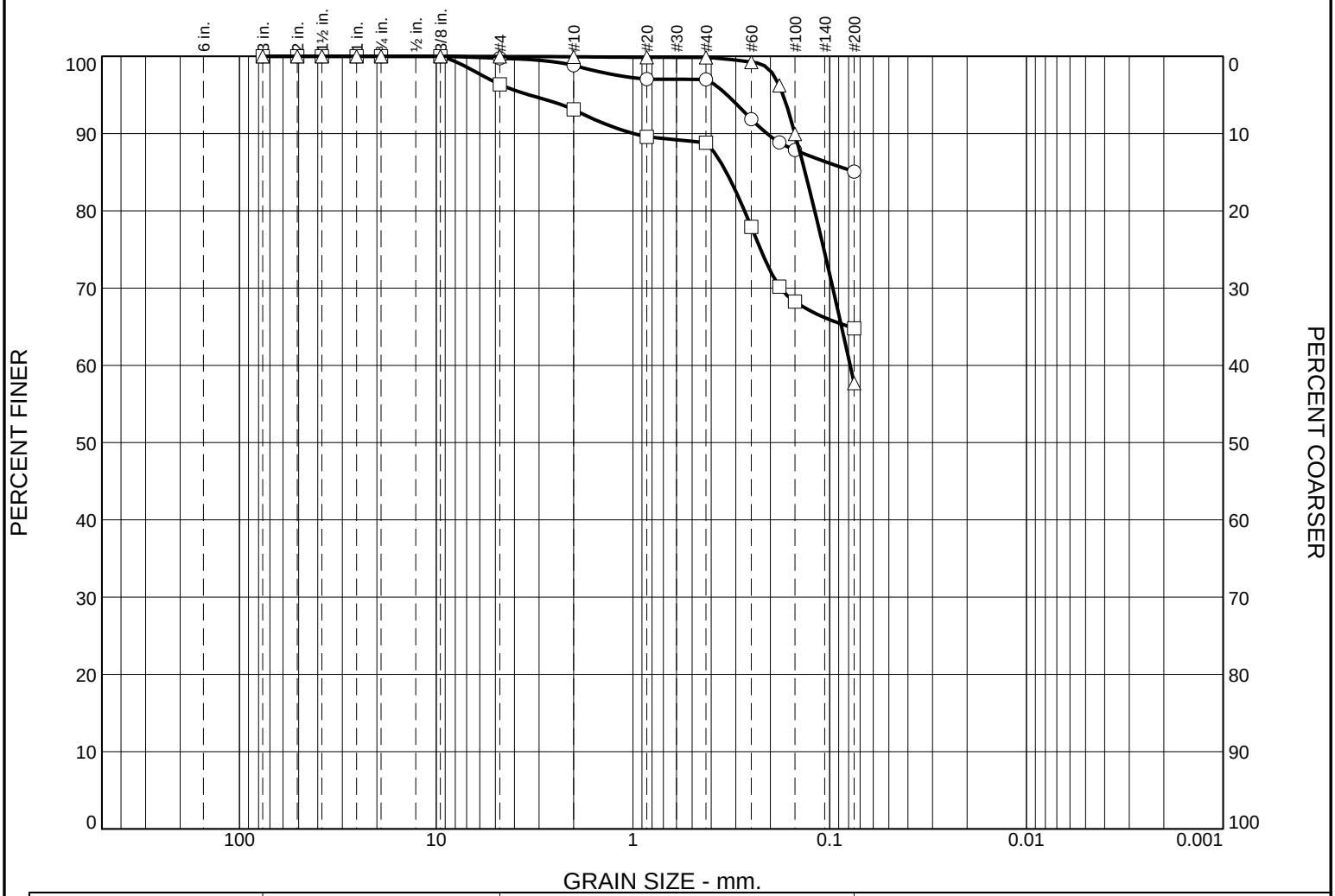
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.9	1.8	11.9	85.1	
□	0.0	0.0	3.6	3.3	4.3	24.0	64.8	
△	0.0	0.0	0.0	0.1	0.0	42.2	57.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	91	35								
□			0.3350							
△	35	21	0.1333	0.0786						

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, FAT CLAY	09/21/2015	CH	57.3
□ Gray-black, SANDY FAT CLAY, contains wood fragments and PEAT	09/21/2015	CH	77.6
△ Gray, SANDY LEAN CLAY	09/21/2015	CL	31.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-26 **Depth:** 13.00-15.00 **Sample Number:** S-6

□ **Source of Sample:** BH-26 **Depth:** 18.00-20.00 **Sample Number:** S-7

△ **Source of Sample:** BH-26 **Depth:** 28.00-30.00 **Sample Number:** S-9

Remarks:

ECS MID-ATLANTIC, LLC
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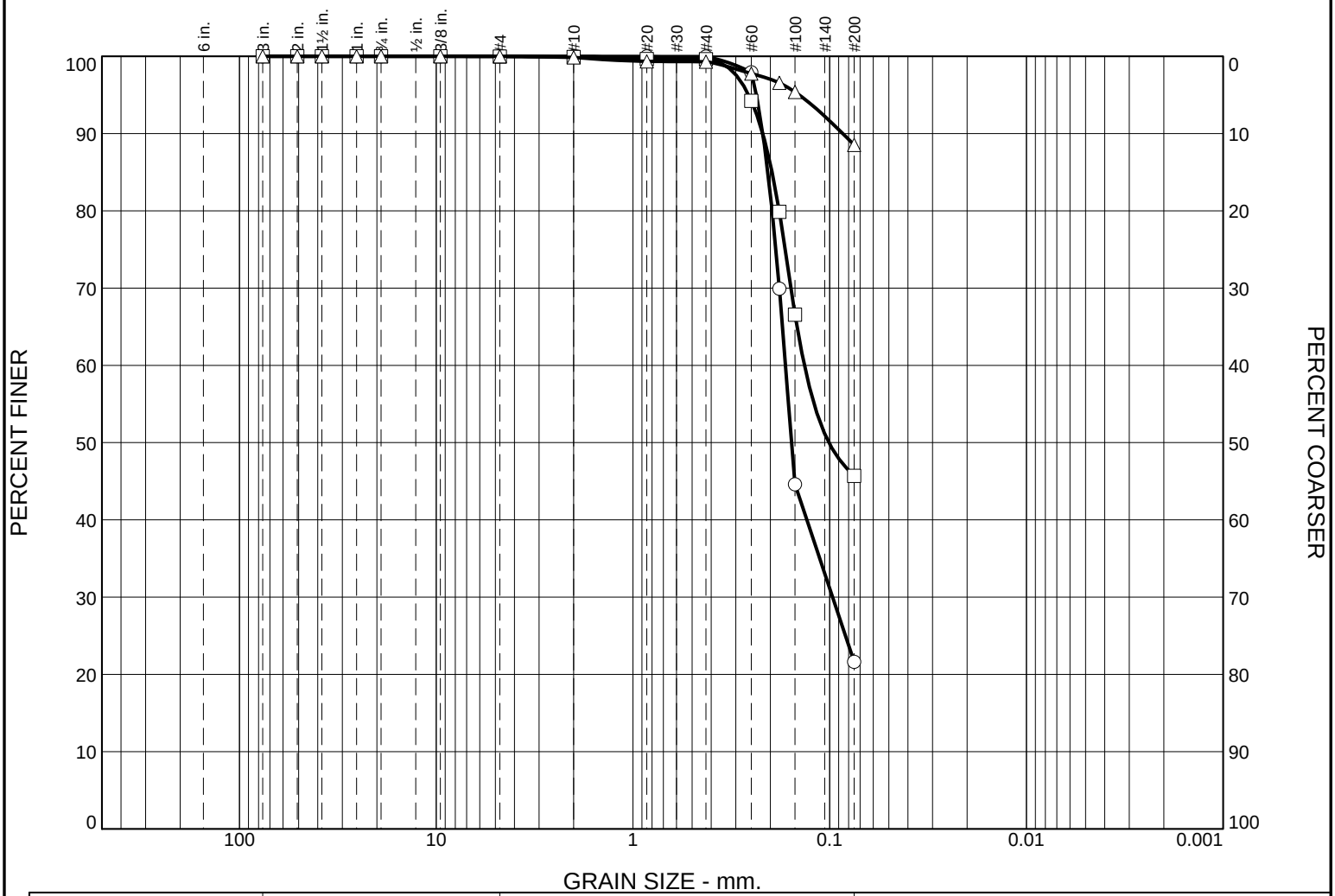
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.0	78.4	21.6	
□	0.0	0.0	0.0	0.1	0.3	53.9	45.7	
△	0.0	0.0	0.0	0.1	0.6	10.8	88.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	32	22	0.2059	0.1677	0.1563	0.0965				
□	40	20	0.1960	0.1344	0.1009					
△	84	34								

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, CLAYEY SAND	09/21/2015	SC	26.4
□ Gray, CLAYEY SAND	09/21/2015	SC	47.9
△ Gray, FAT CLAY	09/21/2015	CH	58.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-26 **Depth:** 58.00-60.00 **Sample Number:** S-15

□ **Source of Sample:** BH-26 **Depth:** 78.00-80.00 **Sample Number:** S-19

△ **Source of Sample:** BH-26 **Depth:** 93.00-95.00 **Sample Number:** S-22

Remarks:

ECS MID-ATLANTIC, LLC
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Virginia Beach, VA 23452
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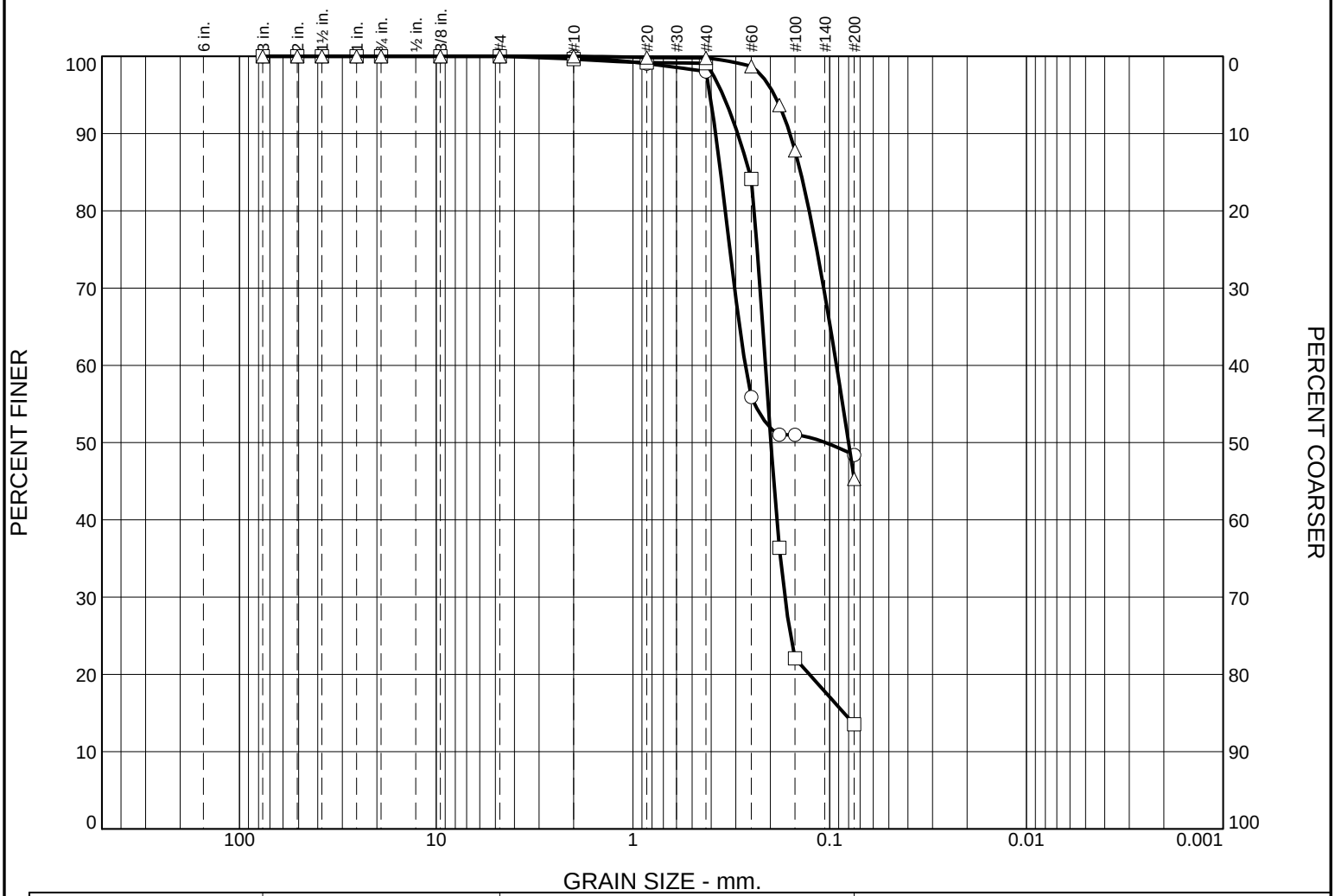
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	2.0	49.6	48.4	
□	0.0	0.0	0.0	0.4	0.5	85.6	13.5	
△	0.0	0.0	0.0	0.0	0.2	54.5	45.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3583	0.2682	0.1048					
□	NP	NP	0.2556	0.2118	0.1988	0.1689	0.0844			
△	NP	NP	0.1405	0.0922	0.0801					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-tan, CLAYEY SAND	10/8/2015	SC	18.1
□ Gray, SILTY SAND	10/8/2015	SM	28.0
△ Gray, SILTY SAND	10/8/2015	SM	31.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-27 **Depth:** 4.00-6.00 **Sample Number:** S-3

□ **Source of Sample:** BH-27 **Depth:** 18.0-20.0 **Sample Number:** S-7

△ **Source of Sample:** BH-27 **Depth:** 28.00-30.00 **Sample Number:** S-9

Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
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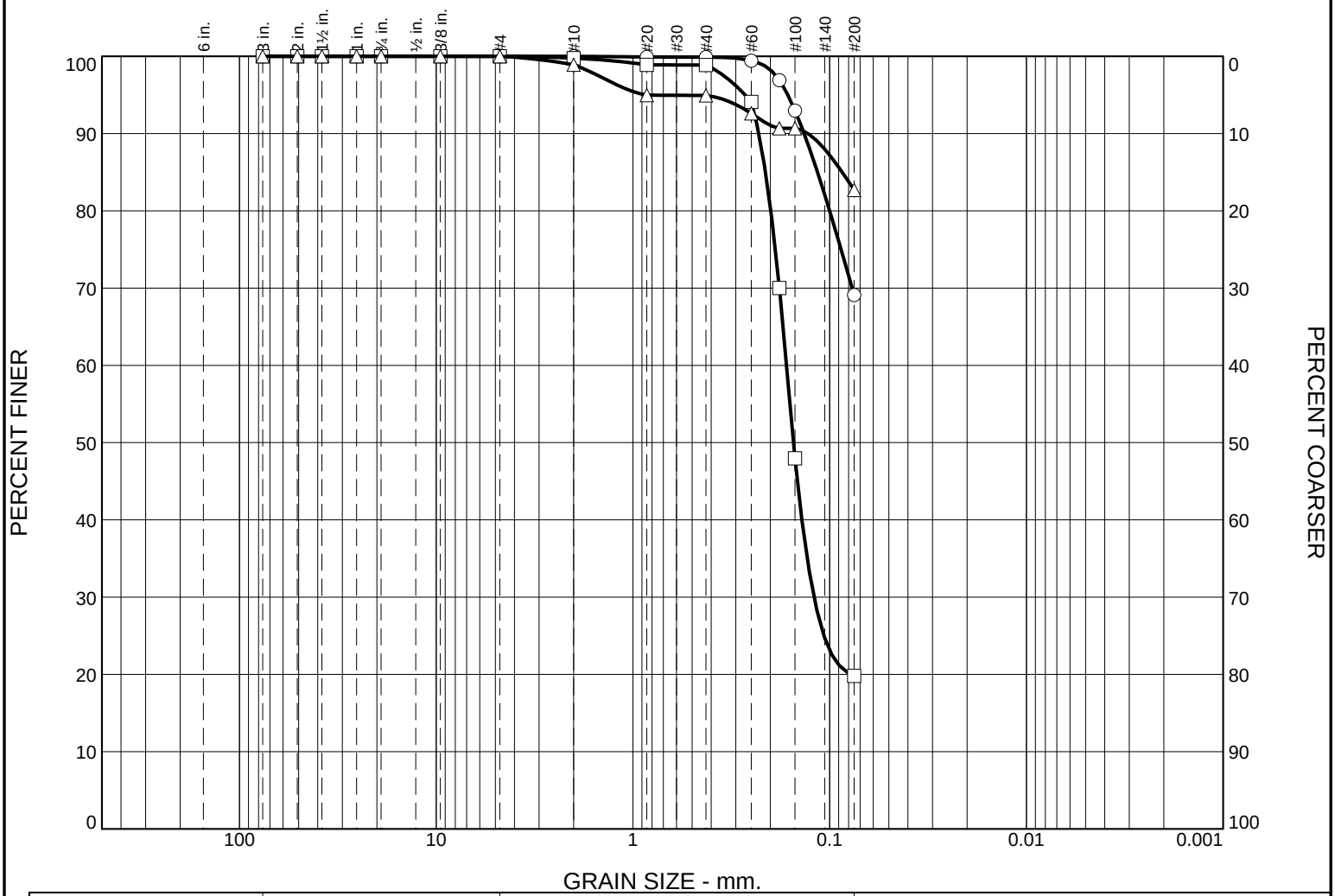
Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	30.8	69.1	
□	0.0	0.0	0.0	0.2	0.9	79.1	19.8	
△	0.0	0.0	0.0	1.1	4.0	12.2	82.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	31	22	0.1152							
□			0.2118	0.1657	0.1527	0.1201				
△	80	29	0.0863							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SANDY LEAN CLAY	10/8/2015	CL	35.9
□ Gray, SILTY SAND	10/8/2015	SM	35.5
△ Gray, FAT CLAY WITH SAND	10/8/2015	CH	59.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-27 **Depth:** 48.0-50.0 **Sample Number:** S-13

□ **Source of Sample:** BH-27 **Depth:** 68.0-70.0 **Sample Number:** S-17

△ **Source of Sample:** BH-27 **Depth:** 98.00-100.00 **Sample Number:** S-23

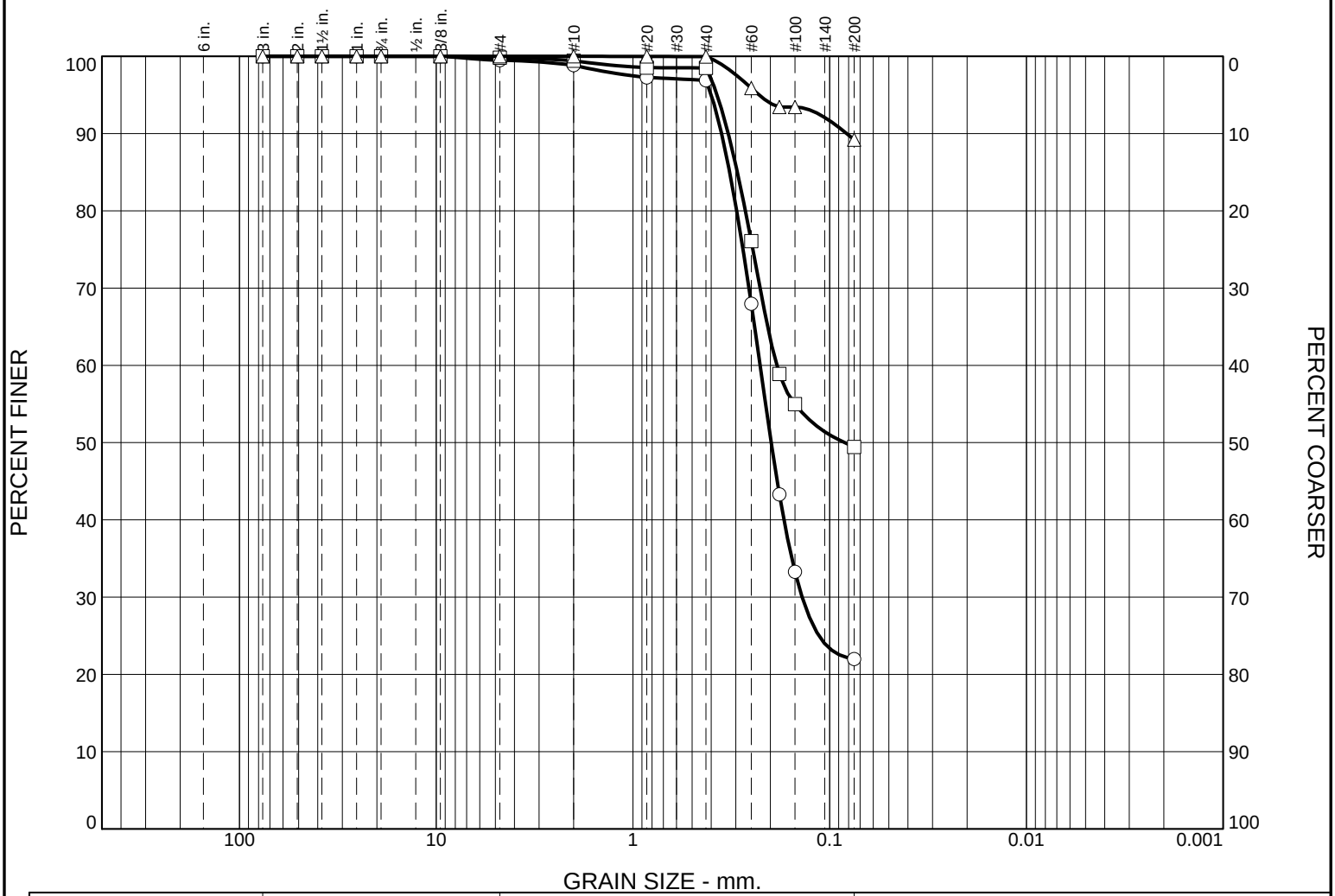
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.5	0.7	1.9	74.9	22.0	
□	0.0	0.0	0.2	0.4	0.9	49.1	49.4	
△	0.0	0.0	0.0	0.0	0.0	10.8	89.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3222	0.2255	0.1980	0.1380				
□			0.2944	0.1856	0.0838					
△										

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SILTY SAND	10/06/2015	SM	7.7
□ Brown, CLAYEY SAND	10/06/2015	SC	10.7
△ Orange-brown, LEAN CLAY	10/06/2015	CL	21.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-28 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-28 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-28 **Depth:** 4.00-6.00 **Sample Number:** S-3

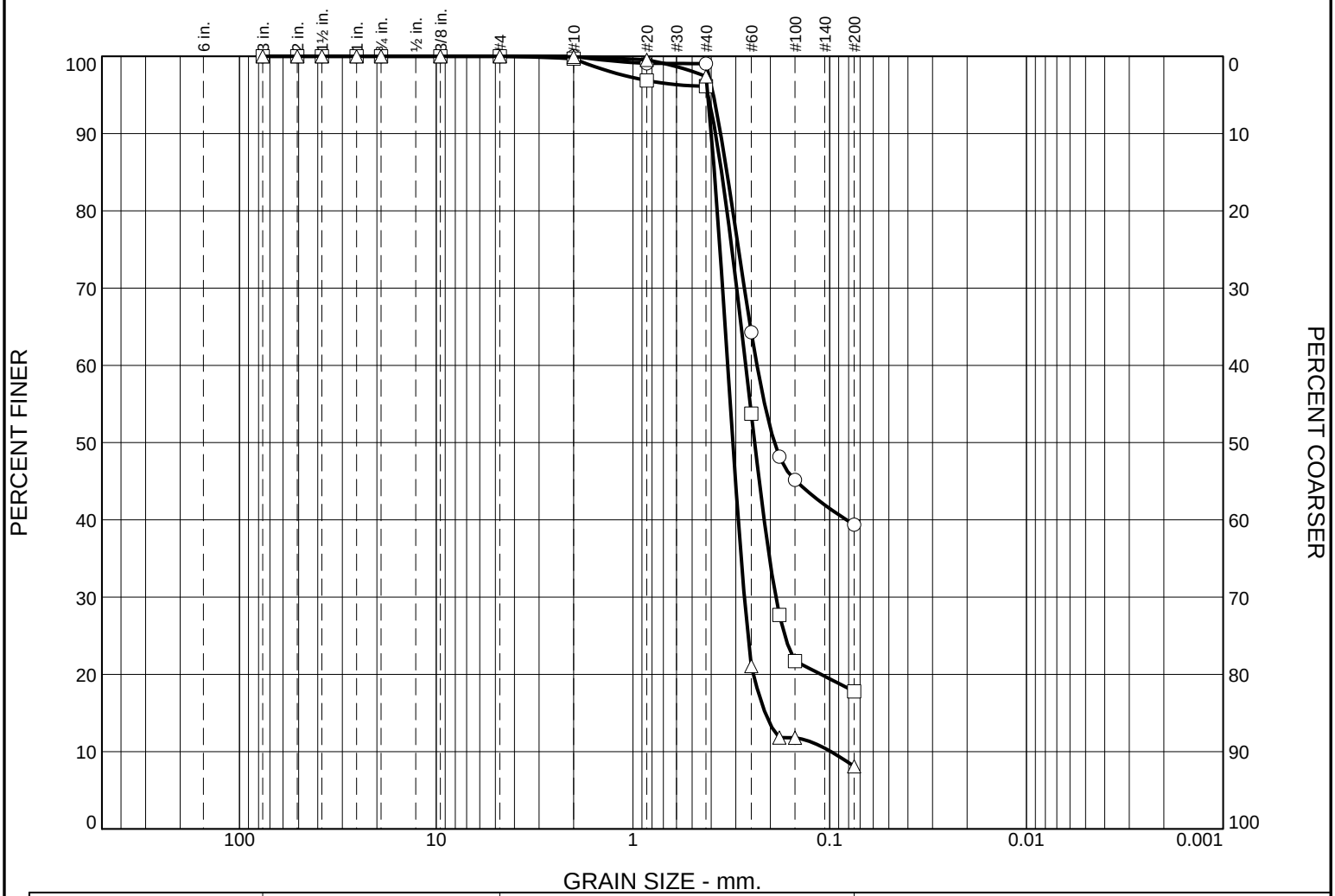
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	1.0	59.6	39.4	
□	0.0	0.0	0.0	0.3	3.6	78.3	17.8	
△	0.0	0.0	0.0	0.1	2.5	89.3	8.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3327	0.2339	0.1908					
□	NP	NP	0.3540	0.2669	0.2403	0.1877				
△	NP	NP	0.3853	0.3295	0.3103	0.2712	0.2124	0.0984	2.27	3.35

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-brown, SILTY SAND	10/6/2015	SM	12.9
□ Orange-brown, SILTY SAND	10/6/2015	SM	6.5
△ Orange-tan, POORLY GRADED SAND WITH SILT	10/6/2015	SP-SM	21.3

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-28 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-28 **Depth:** 8.00-10.0 **Sample Number:** S-5

△ **Source of Sample:** BH-28 **Depth:** 13.0-15.0 **Sample Number:** S-6

Remarks:

ECS MID-ATLANTIC, LLC
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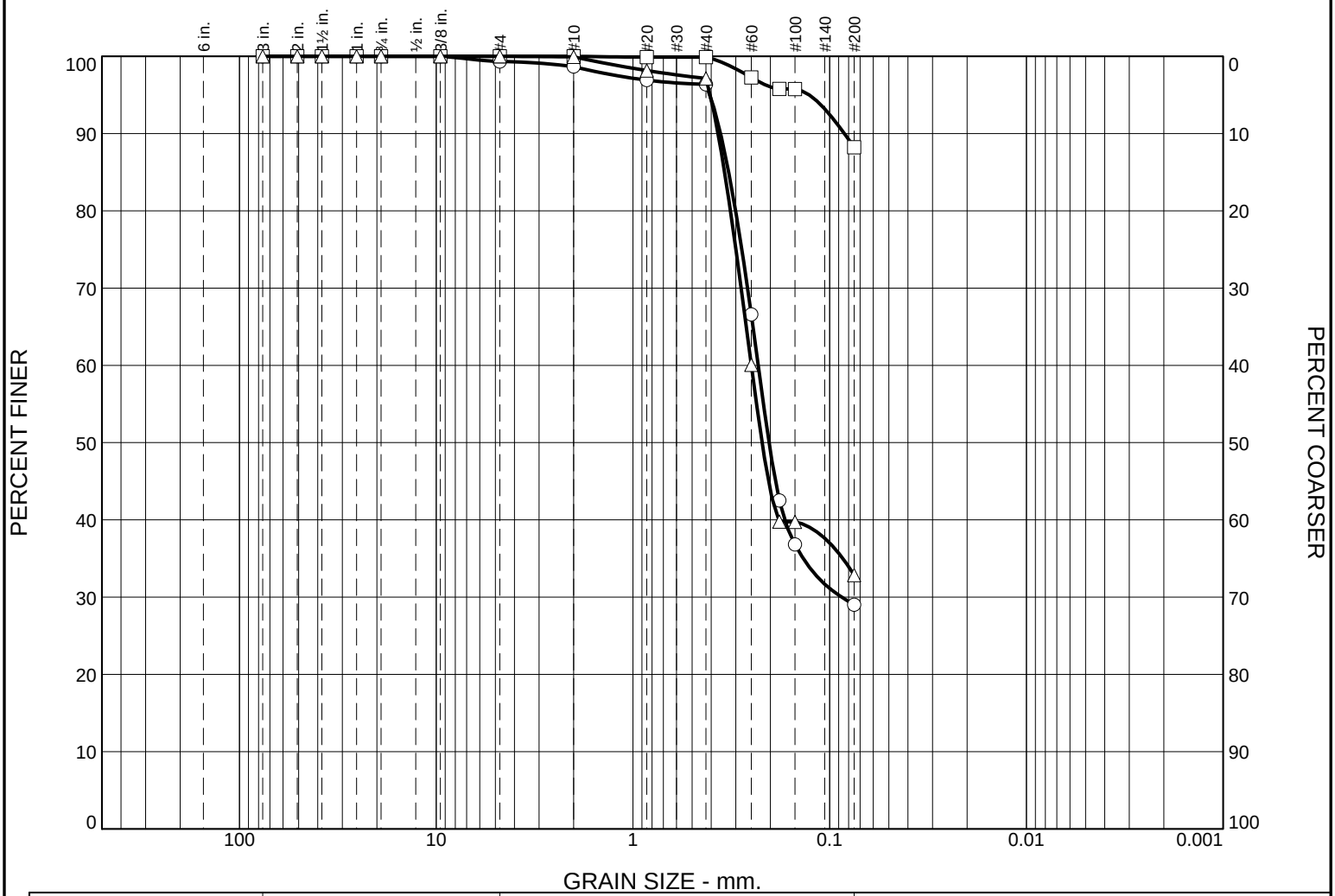
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	0.6	2.3	67.4	29.0	
□	0.0	0.0	0.0	0.0	0.1	11.7	88.2	
△	0.0	0.0	0.0	0.1	2.8	64.2	32.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3259	0.2306	0.2032	0.0868				
□										
△			0.3418	0.2498	0.2204					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SILTY SAND	10/6/2015	SM	9.0
□ Orange-brown, LEAN CLAY	10/6/2015	CL	20.6
△ Orange-brown, SILTY SAND	10/6/2015	SM	10.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-29 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-29 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-29 **Depth:** 4.00-6.00 **Sample Number:** S-3

Remarks:

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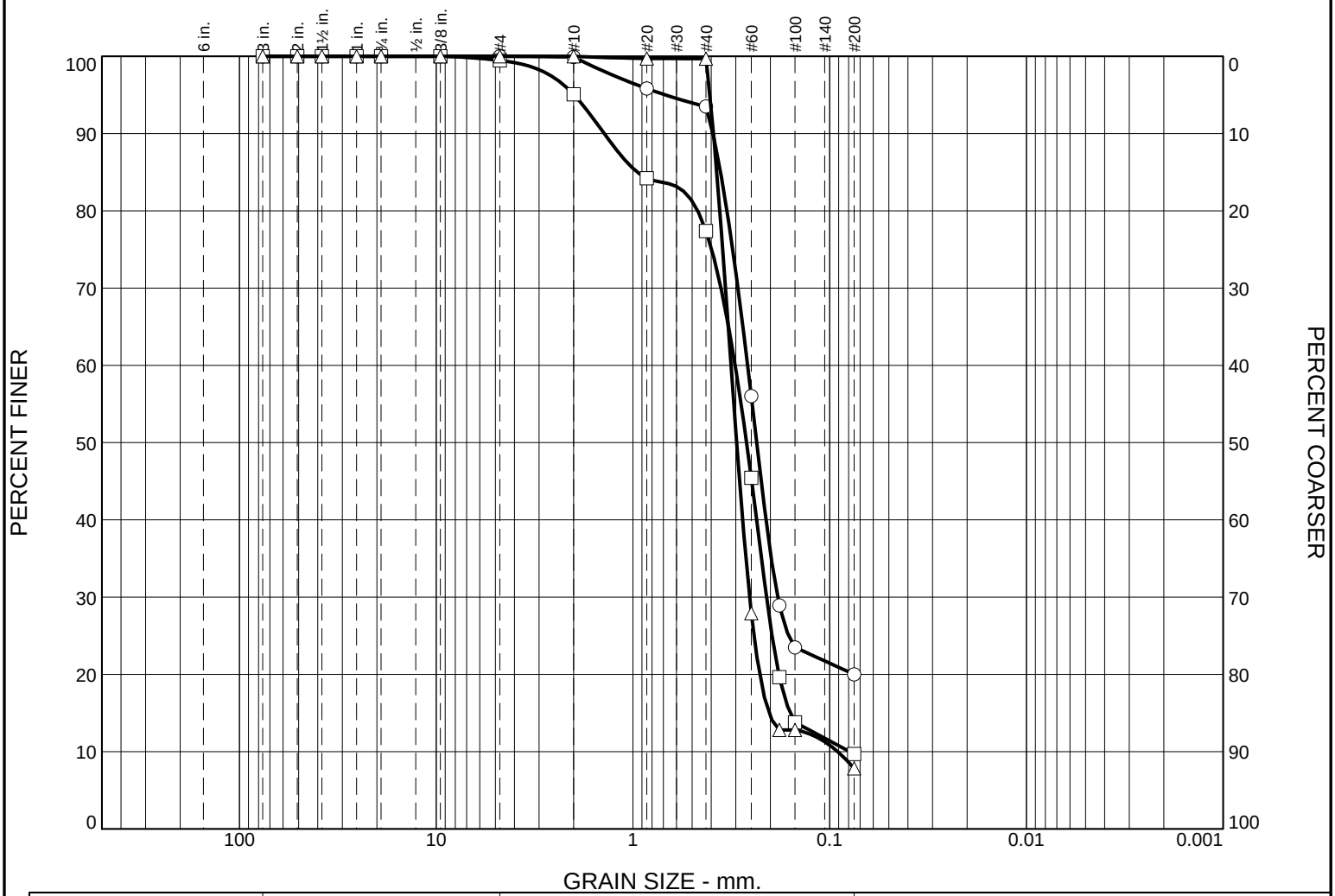
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	6.4	73.5	20.0	
□	0.0	0.0	0.5	4.4	17.7	67.7	9.7	
△	0.0	0.0	0.0	0.0	0.3	91.9	7.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3584	0.2609	0.2347	0.1836				
□	NP	NP	0.9495	0.3020	0.2641	0.2092	0.1585	0.0788	1.84	3.83
△	NP	NP	0.3747	0.3170	0.2968	0.2551	0.2033	0.0909	2.26	3.49

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-brown, SILTY SAND	10/6/2015	SM	9.1
□ Gray, POORLY GRADED SAND WITH SILT	10/6/2015	SP-SM	6.4
△ Gray, POORLY GRADED SAND WITH SILT	10/6/2015	SP-SM	19.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-29 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-29 **Depth:** 8.0-10.0 **Sample Number:** S-5

△ **Source of Sample:** BH-29 **Depth:** 13.0-15.0 **Sample Number:** S-6

Remarks:

ECS MID-ATLANTIC, LLC
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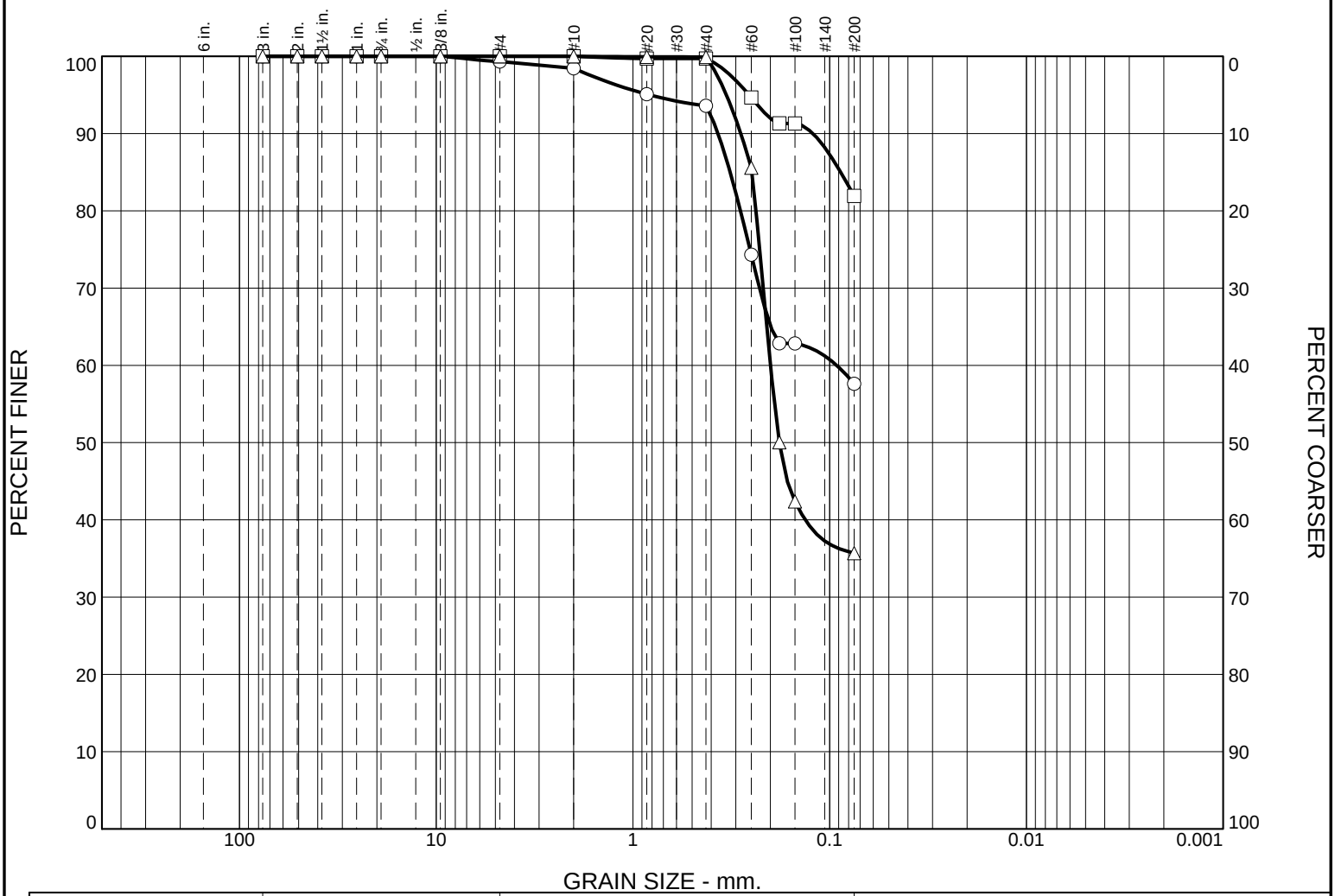
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: ○ hr □ rjw △ hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.7	0.9	4.8	36.0	57.6	
□	0.0	0.0	0.0	0.0	0.3	17.8	81.9	
△	0.0	0.0	0.0	0.0	0.1	64.2	35.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3203	0.0921						
□			0.0879							
△			0.2485	0.1998	0.1799					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-brown, SANDY LEAN CLAY	10/6/2015	CL	14.5
□ Orange-brown, LEAN CLAY WITH SAND	10/6/2015	CL	20.8
△ Orange-brown, SILTY SAND	10/6/2015	SM	13.4

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-30 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-30 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-30 **Depth:** 4.00-6.00 **Sample Number:** S-3

Remarks:

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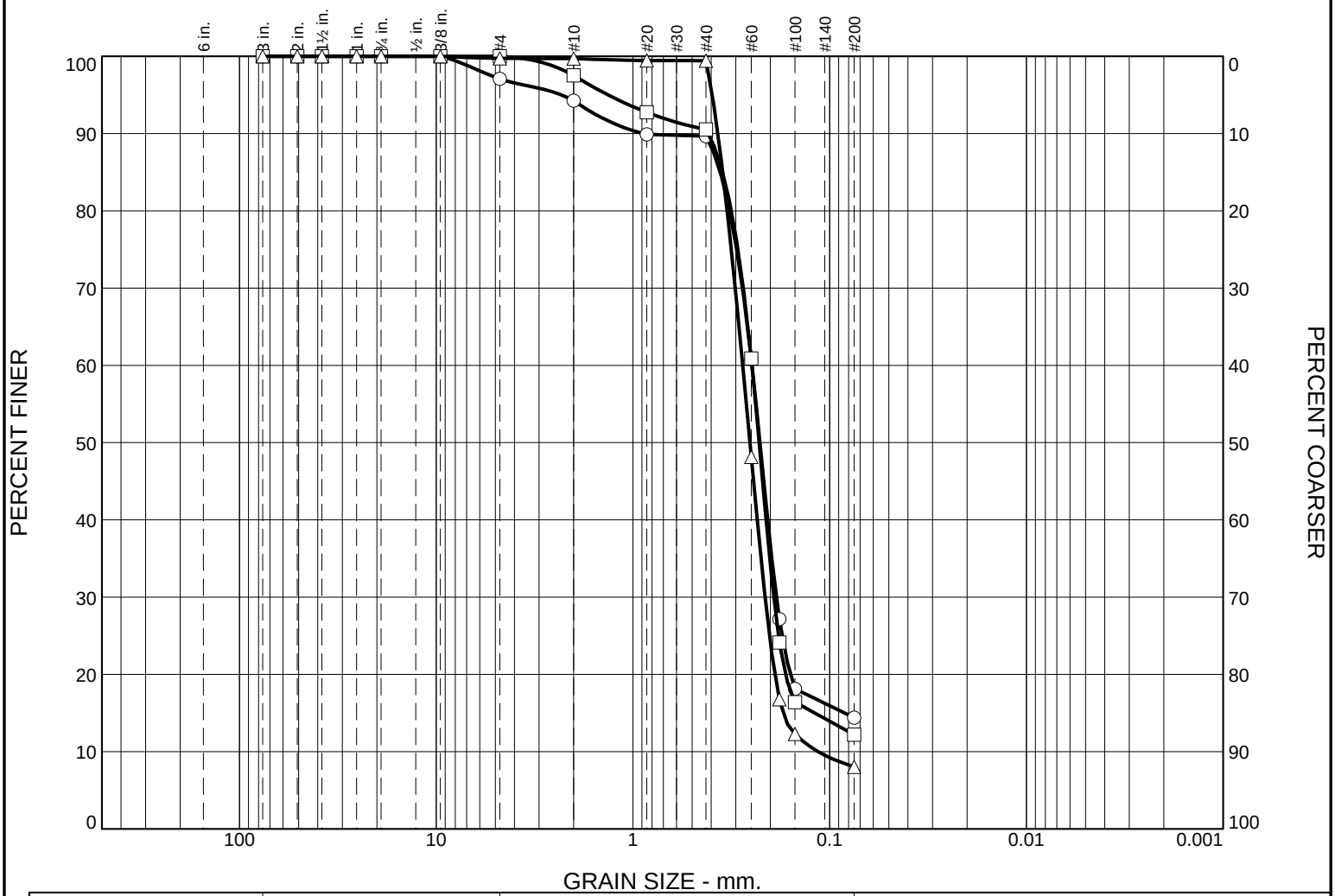
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.9	2.8	4.6	75.3	14.4	
□	0.0	0.0	0.0	2.5	7.0	78.3	12.2	
△	0.0	0.0	0.3	0.0	0.3	91.4	8.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3597	0.2480	0.2260	0.1865	0.0838			
□	NP	NP	0.3500	0.2480	0.2280	0.1924	0.1189			
△	NP	NP	0.3494	0.2764	0.2539	0.2128	0.1725	0.1145	1.43	2.41

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Orange-brown, SILTY SAND	10/6/2015	SM	11.2
□ Orange-brown, SILTY SAND	10/6/2015	SM	16.4
△ Tan, POORLY GRADED SAND WITH SILT	10/6/2015	SP-SM	22.5

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-30 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-30 **Depth:** 8.00-10.0 **Sample Number:** S-5

△ **Source of Sample:** BH-30 **Depth:** 13.0-15.0 **Sample Number:** S-6

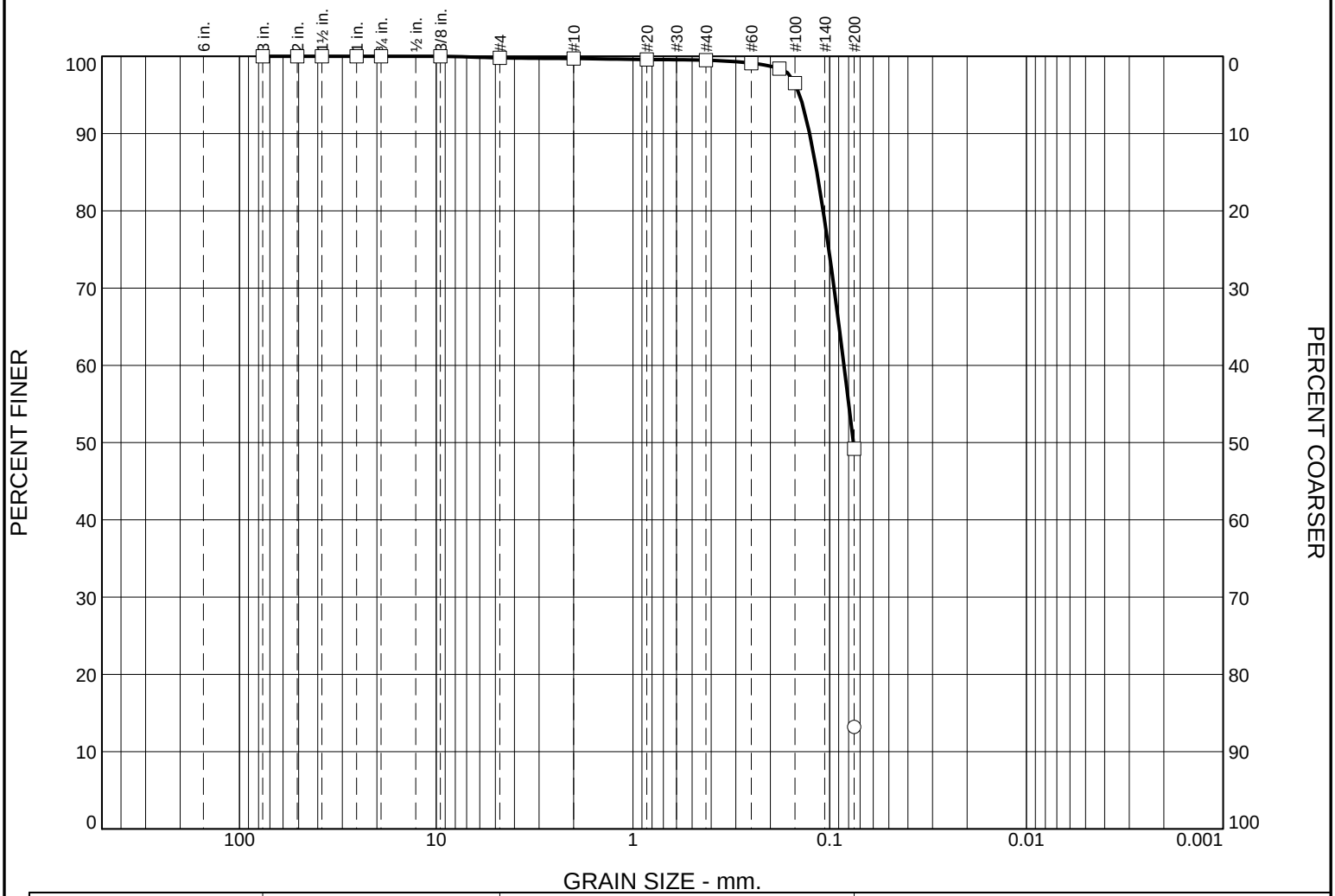
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○							13.2	
□	0.0	0.0	0.2	0.1	0.2	50.3	49.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	209	118								
□	35	25	0.1160	0.0845	0.0757					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, ORGANIC CLAY	10/05/2015	OH	151.0
□ Gray, SILTY SAND	10/05/2015	SM	34.6

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-34 **Depth:** 8.00-10.00 **Sample Number:** S-5

□ **Source of Sample:** BH-34 **Depth:** 33.00-35.00 **Sample Number:** S-10

Remarks:

○ Sample contained significant wood which affected #200 wash values.

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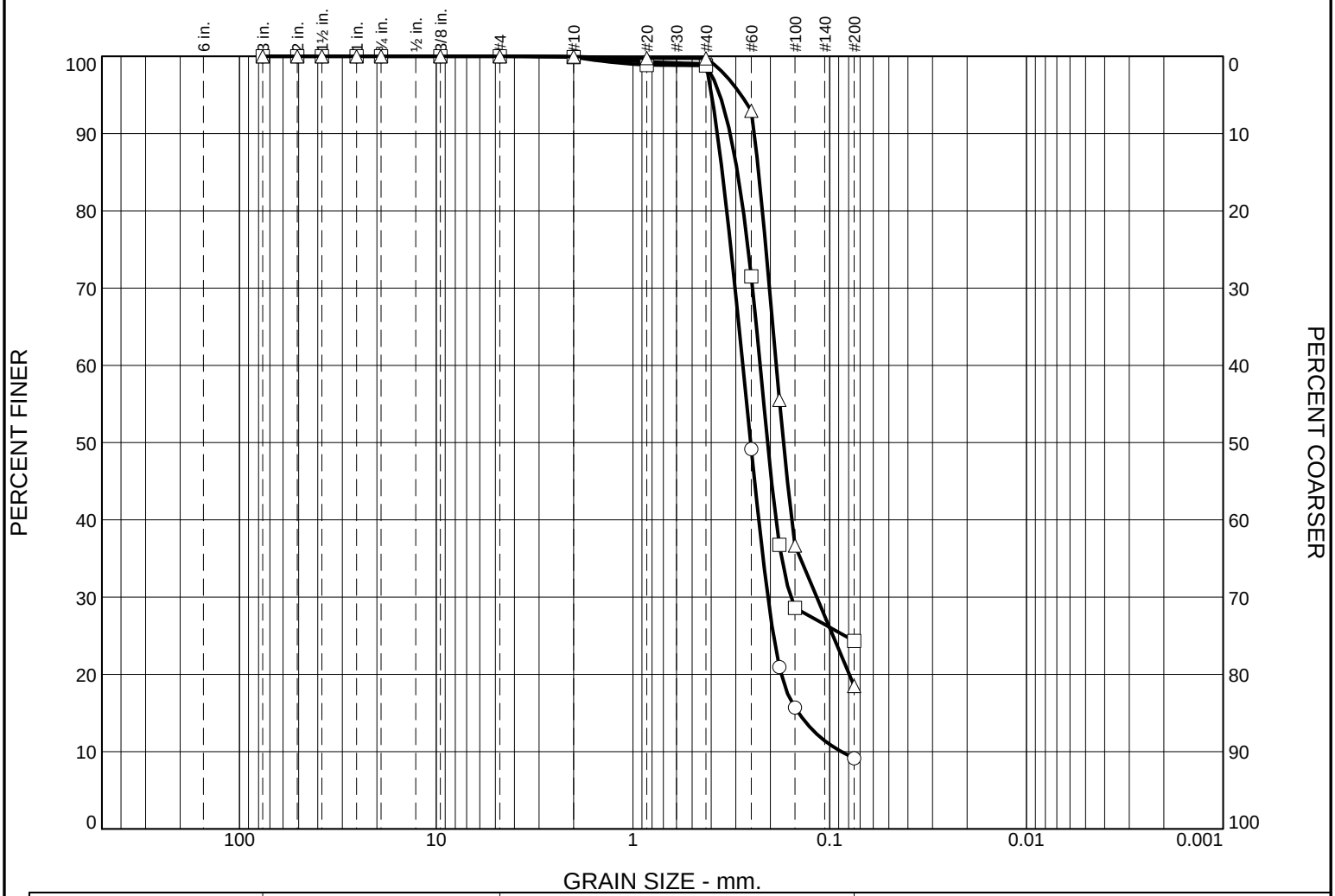
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.9	89.9	9.1	
□	0.0	0.0	0.0	0.1	1.1	74.5	24.3	
△	0.0	0.0	0.0	0.0	0.3	81.2	18.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3513	0.2759	0.2519	0.2058	0.1436	0.0870	1.76	3.17
□	22	NP	0.2939	0.2254	0.2067	0.1573				
△	NP	NP	0.2296	0.1867	0.1716	0.1163				

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Light tan, POORLY GRADED SAND WITH SILT	10/02/2015	SP-SM	6.1
□ Tan mottled orange, SILTY SAND	10/02/2015	SM	14.5
△ Tan mottled orange, SILTY SAND	10/02/2015	SM	25.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-36 **Depth:** 8.0-10.0 **Sample Number:** S-5

□ **Source of Sample:** BH-36 **Depth:** 18.0-20.0 **Sample Number:** S-7

△ **Source of Sample:** BH-36 **Depth:** 23.0-25.0 **Sample Number:** S-8

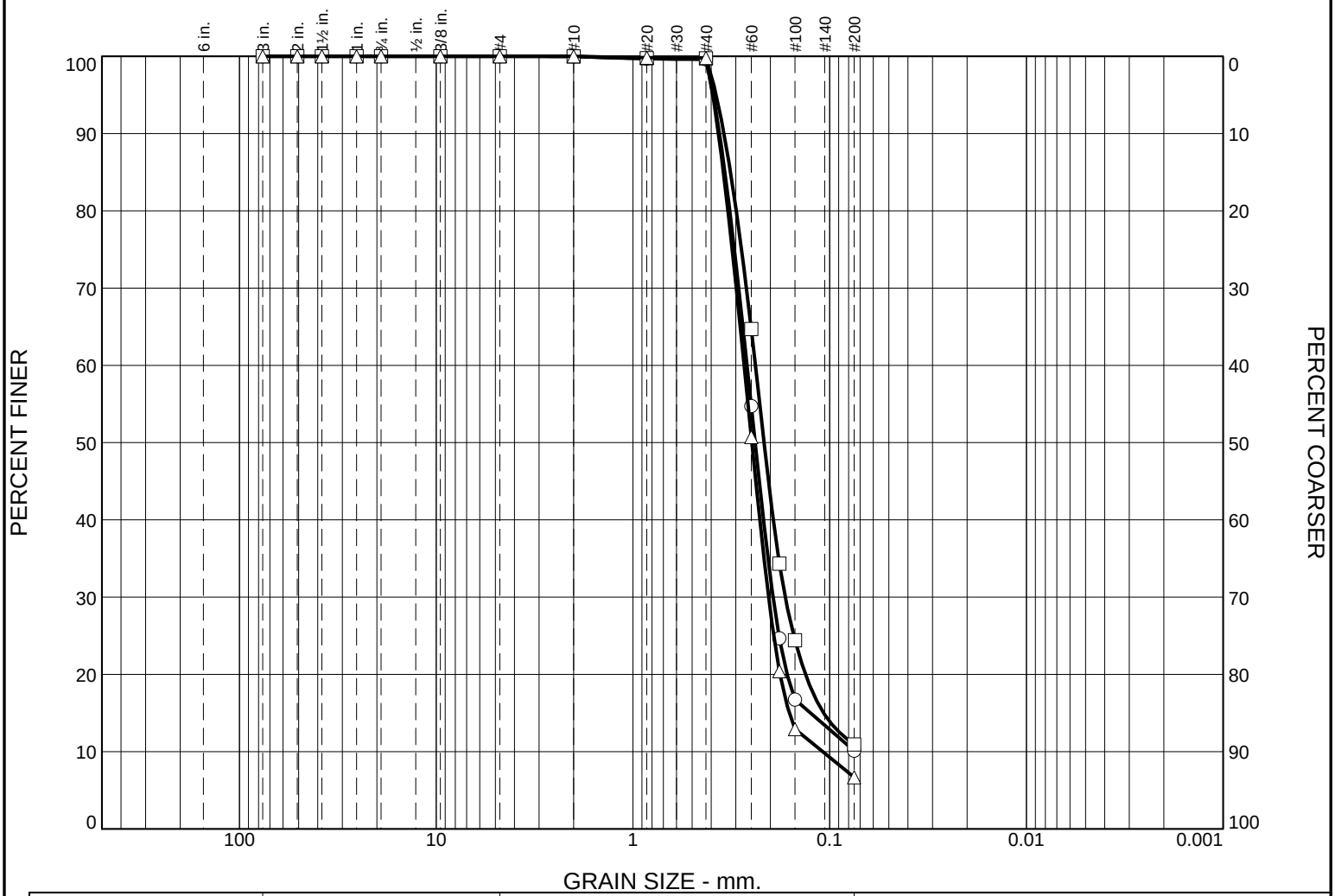
Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.4	89.5	10.1	
□	0.0	0.0	0.0	0.0	0.3	88.8	10.9	
△	0.0	0.0	0.0	0.0	0.2	93.1	6.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.3406	0.2629	0.2390	0.1939	0.1250			
□	NP	NP	0.3190	0.2382	0.2153	0.1683	0.1073			
△	NP	NP	0.3465	0.2719	0.2484	0.2042	0.1603	0.1084	1.42	2.51

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Light tan, POORLY GRADED SAND WITH SILT	10/06/2015	SP-SM	4.6
□ Light tan, POORLY GRADED SAND WITH SILT	10/06/2015	SP-SM	12.4
△ Light tan, POORLY GRADED SAND WITH SILT	10/06/2015	SP-SM	23.5

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-38 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-38 **Depth:** 13.0-15.0 **Sample Number:** S-6

△ **Source of Sample:** BH-38 **Depth:** 23.0-25.0 **Sample Number:** S-8

Remarks:

ECS MID-ATLANTIC, LLC
2700 International Pkwy, Suite 100
Virginia Beach, VA 23452
Phone: (757) 366-5100
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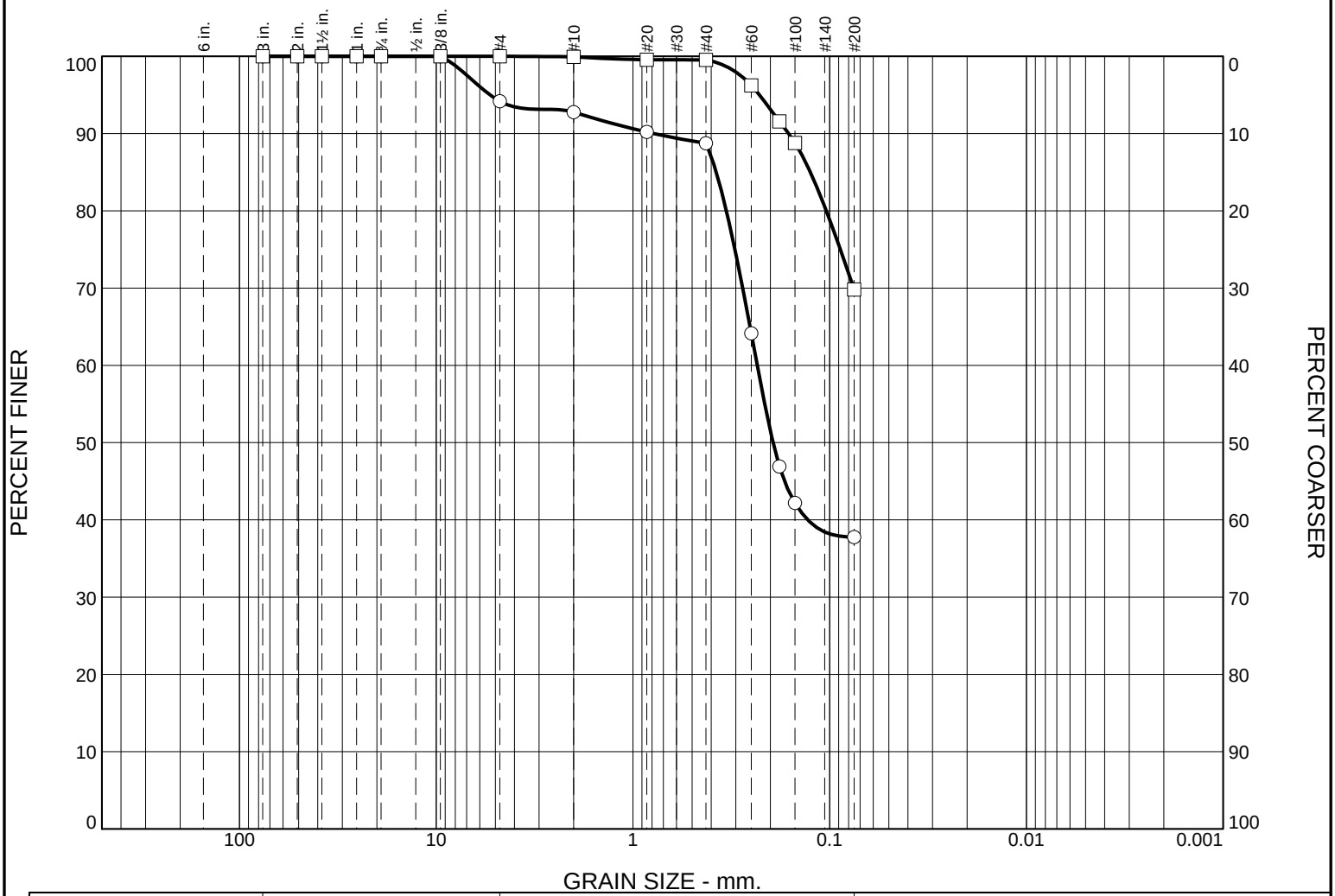
Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	5.8	1.4	4.0	51.0	37.8	
□	0.0	0.0	0.0	0.1	0.4	29.7	69.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	33	22	0.3769	0.2331	0.1938					
□	34	17	0.1253							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, CLAYEY SAND	10/02/2015	SC	39.6
□ Gray, SANDY LEAN CLAY	10/02/2015	CL	29.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-42 **Depth:** 8.00-10.00 **Sample Number:** S-5

□ **Source of Sample:** BH-42 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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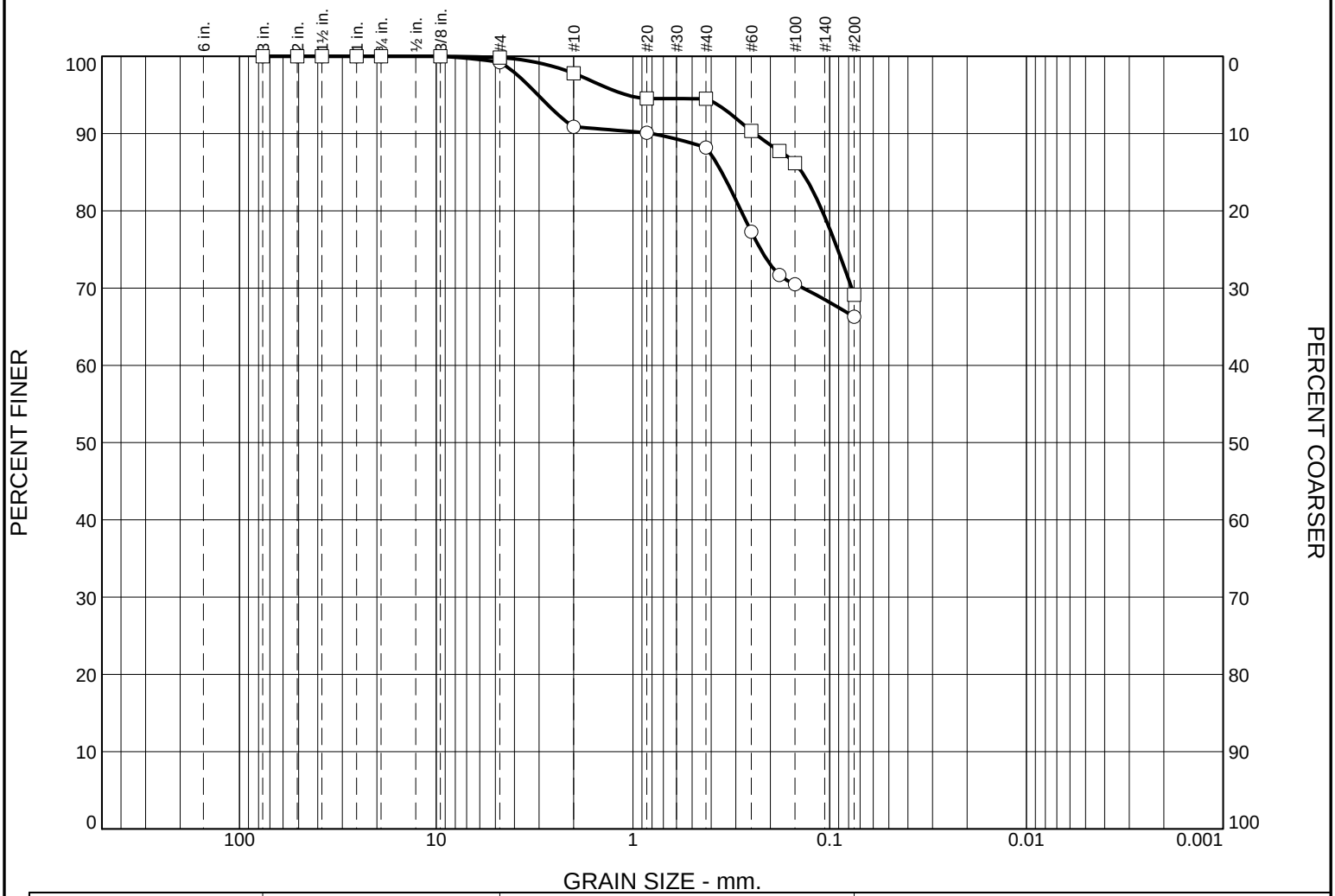
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.8	8.3	2.7	21.9	66.3	
□	0.0	0.0	0.2	2.0	3.3	25.4	69.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	65	35	0.3533							
□	64	27	0.1382							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Black, SANDY ELASTIC SILT	10/02/2015	MH	51.4
□ Gray, SANDY FAT CLAY	10/02/2015	CH	50.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-43 **Depth:** 8.00-10.00 **Sample Number:** S-5

□ **Source of Sample:** BH-43 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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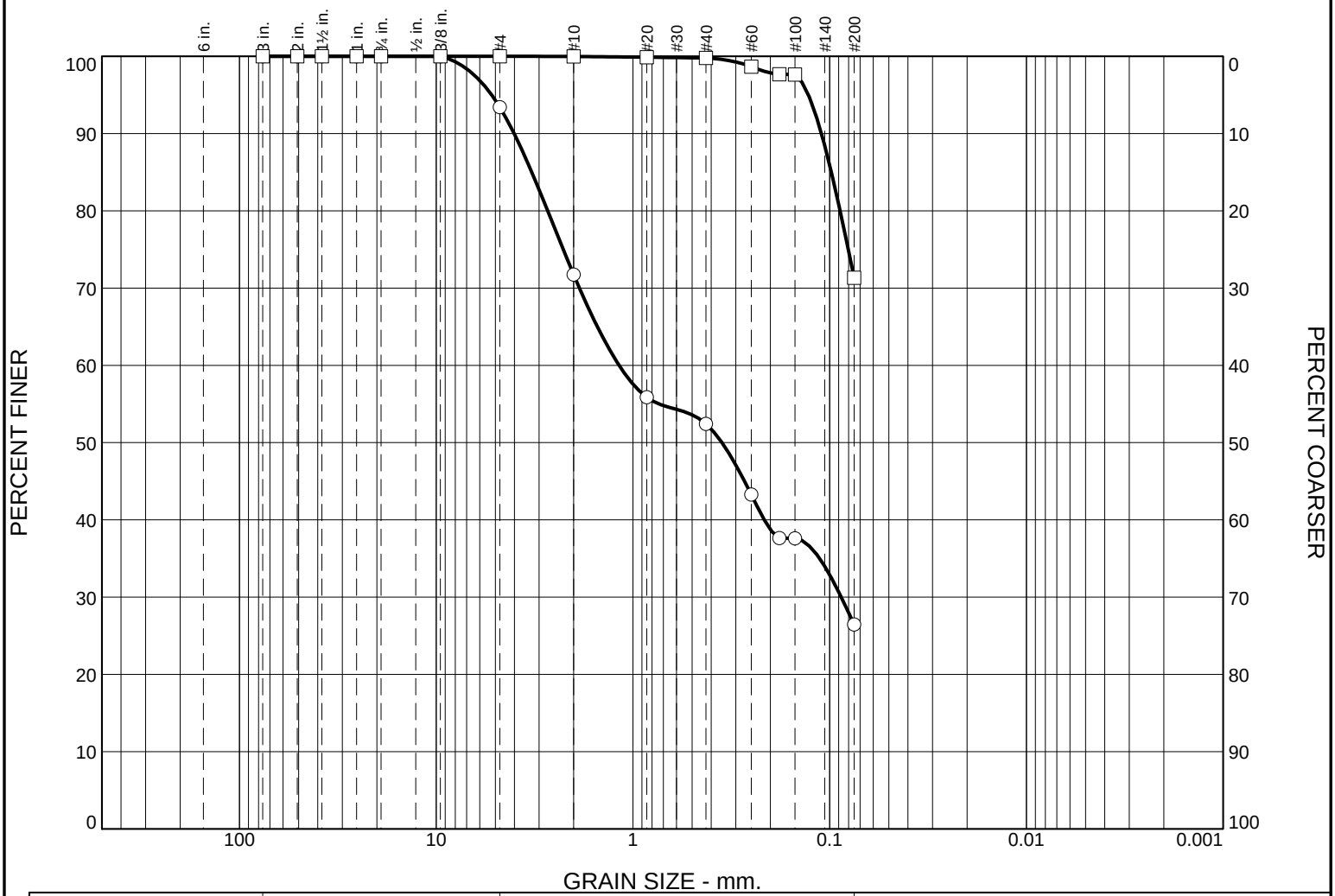
Virginia Beach, VA 23452
Phone: (757) 366-5100
Fax: (757) 366-5203

Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	6.6	21.6	19.4	25.9	26.5	
□	0.0	0.0	0.0	0.0	0.2	28.5	71.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	204	149	3.2682	1.1762	0.3527	0.0873				
□	35	25	0.0980							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, ORGANIC CLAY	10/02/2015	OH	114.6
□ Gray, SILT WITH SAND	10/05/2015	ML	35.1

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-44 **Depth:** 28.00-30.00 **Sample Number:** S-9

□ **Source of Sample:** BH-44 **Depth:** 33.0-35.0 **Sample Number:** S-10

Remarks:

○ Sample contained significant wood fragments which altered GSA

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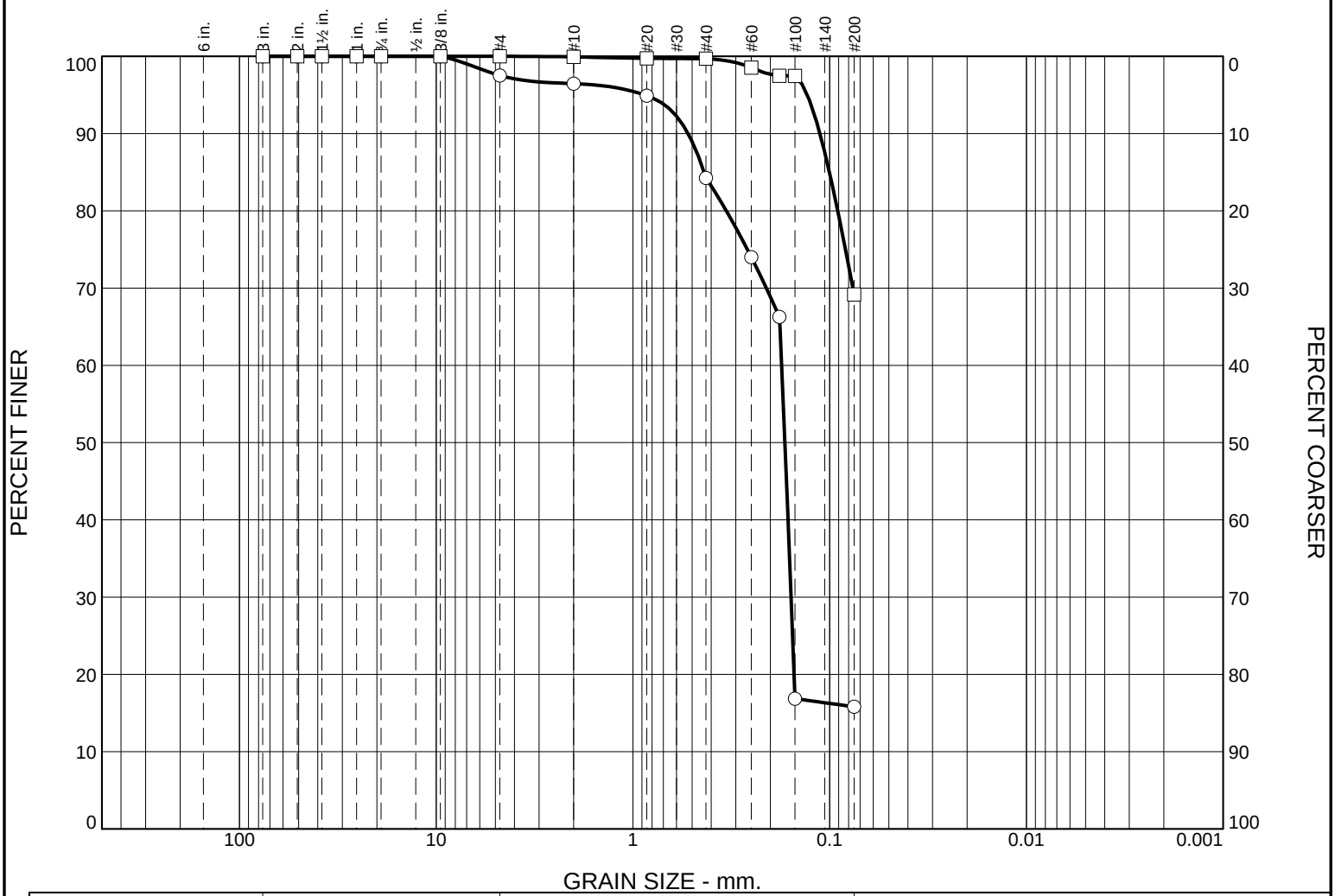
Figure

Tested By: hm **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.5	1.0	12.3	68.4	15.8	
□	0.0	0.0	0.0	0.1	0.2	30.5	69.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.4344	0.1750	0.1684	0.1573				
□	33	18	0.1002							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SILTY SAND, contains marine shell fragments	10/06/2015	SM	26.6
□ Gray, SANDY LEAN CLAY	10/06/2015	CL	30.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-46 **Depth:** 33.0-35.0 **Sample Number:** S-10

□ **Source of Sample:** BH-46 **Depth:** 38.0-40.0 **Sample Number:** S-11

Remarks:

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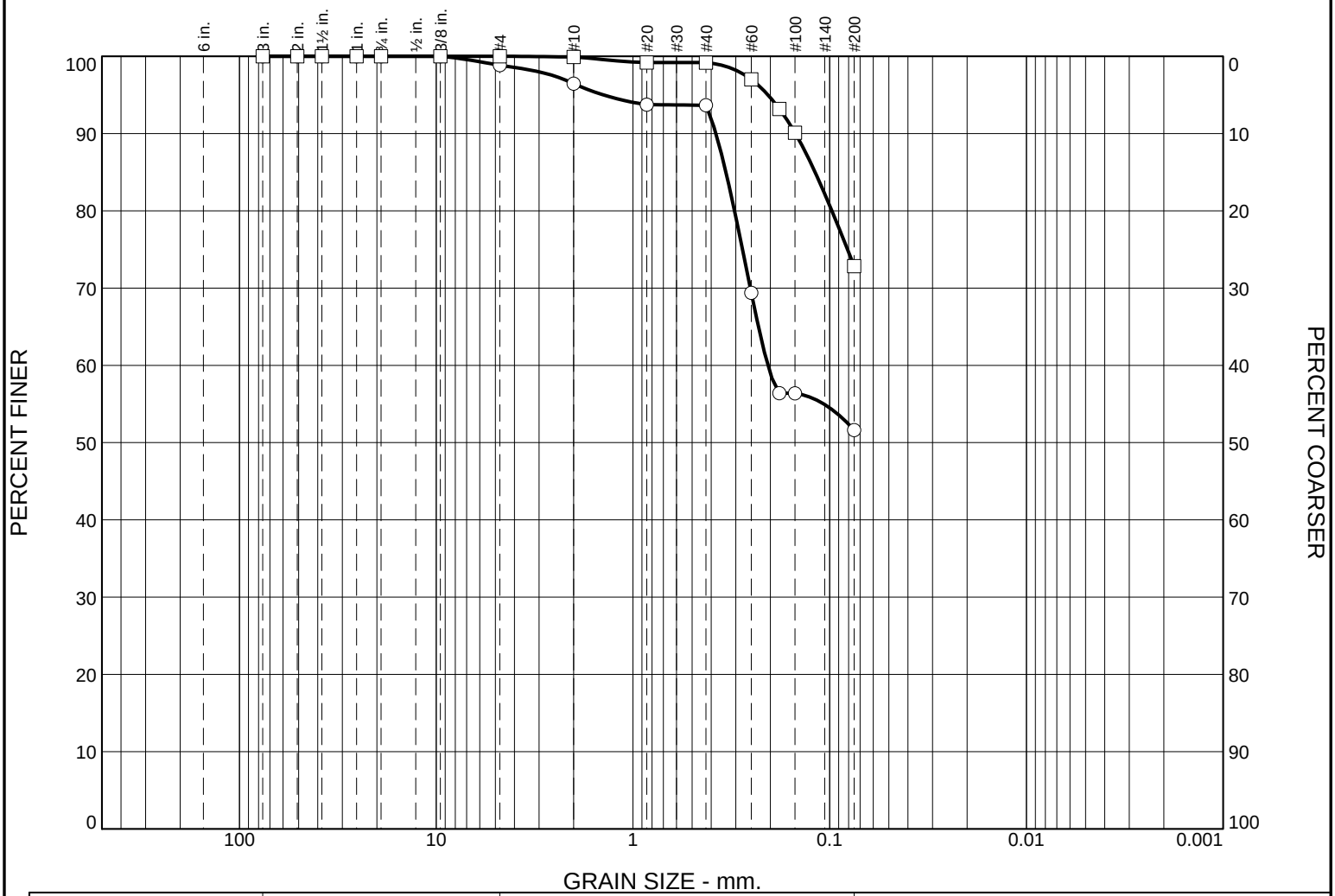
Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.1	2.5	2.7	42.1	51.6	
□	0.0	0.0	0.0	0.1	0.7	26.4	72.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3365	0.2059						
□			0.1185							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SANDY LEAN CLAY	10/8/2015	CL	18.0
□ Gray, LEAN CLAY WITH SAND	10/8/2015	CL	58.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-47 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-47 **Depth:** 33.0-35.0 **Sample Number:** S-10

Remarks:

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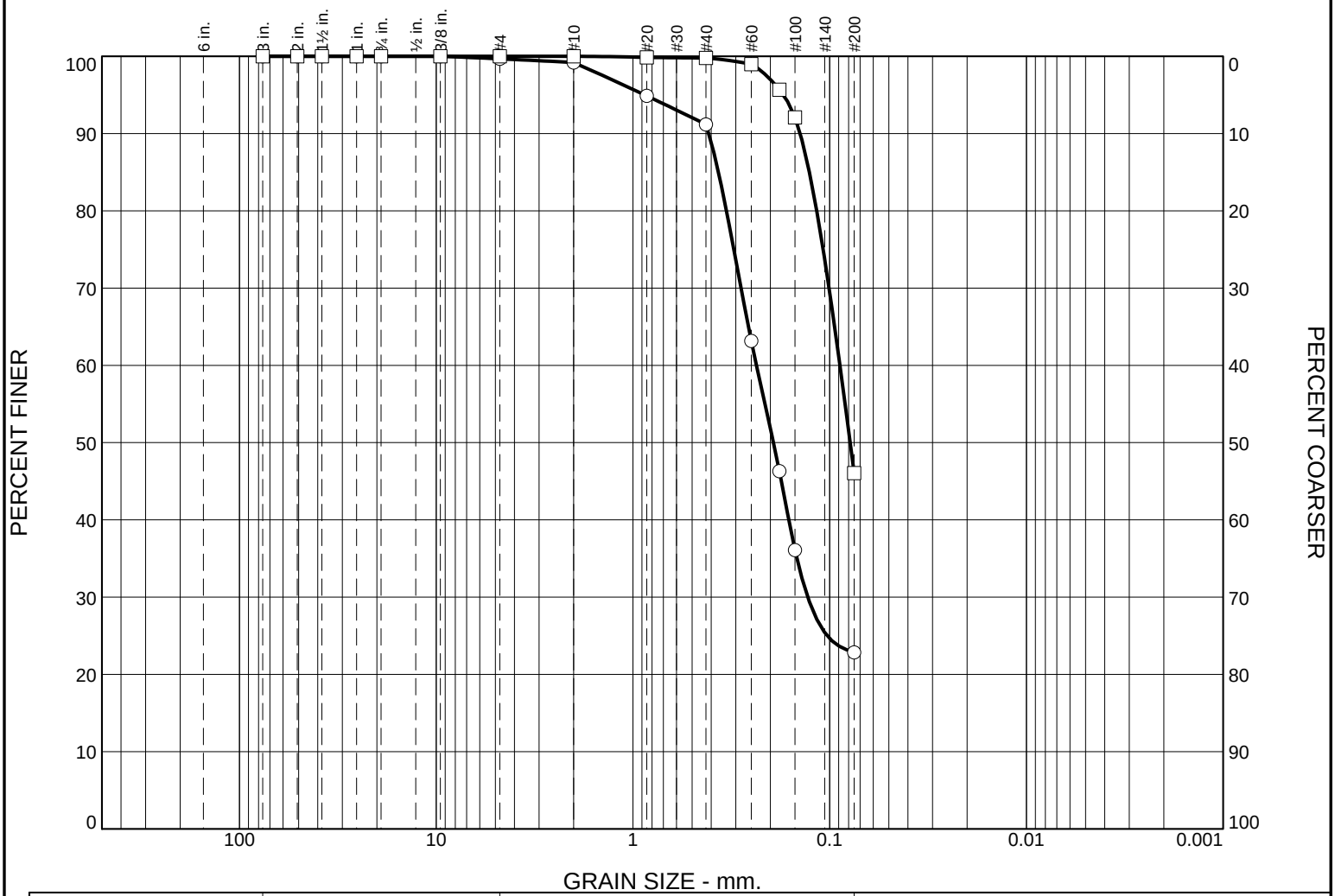
Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.3	0.5	8.0	68.4	22.8	
□	0.0	0.0	0.0	0.0	0.2	53.7	46.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3674	0.2355	0.1929	0.1292				
□			0.1268	0.0886	0.0786					

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Brown, SILTY SAND	10/8/2015	SM	25.2
□ Gray, CLAYEY SAND	10/8/2015	SC	38.3

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-49 **Depth:** 8.0-10.0 **Sample Number:** S-5

□ **Source of Sample:** BH-49 **Depth:** 38 **Sample Number:** S-11

Remarks:

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Figure

Tested By: hr **Checked By:** rjw

Particle Size Distribution Report

	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.4	16.2	83.3	
□	0.0	0.0	4.1	6.2	11.5	64.0	14.2	
△	0.0	0.0	0.0	0.1	0.4	90.9	8.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	39	21	0.1162							
□	NP	NP	1.1389	0.3166	0.2780	0.2097	0.0920			
△	NP	NP	0.2566	0.1985	0.1800	0.1381	0.0963	0.0795	1.21	2.50

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan mottled orange, LEAN CLAY WITH SAND	09/01/2015	CL	12.1
□ Orange-tan, SILTY SAND	09/01/2015	SM	3.9
△ Gray, POORLY GRADED SAND WITH SILT, contains marine shell fragments	09/01/2015	SP-SM	26.0

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-50 **Depth:** 2.00-4.00 **Sample Number:** S-2

□ **Source of Sample:** BH-50 **Depth:** 4.00-6.00 **Sample Number:** S-3

△ **Source of Sample:** BH-50 **Depth:** 23.0-25.0 **Sample Number:** S-8

Remarks:

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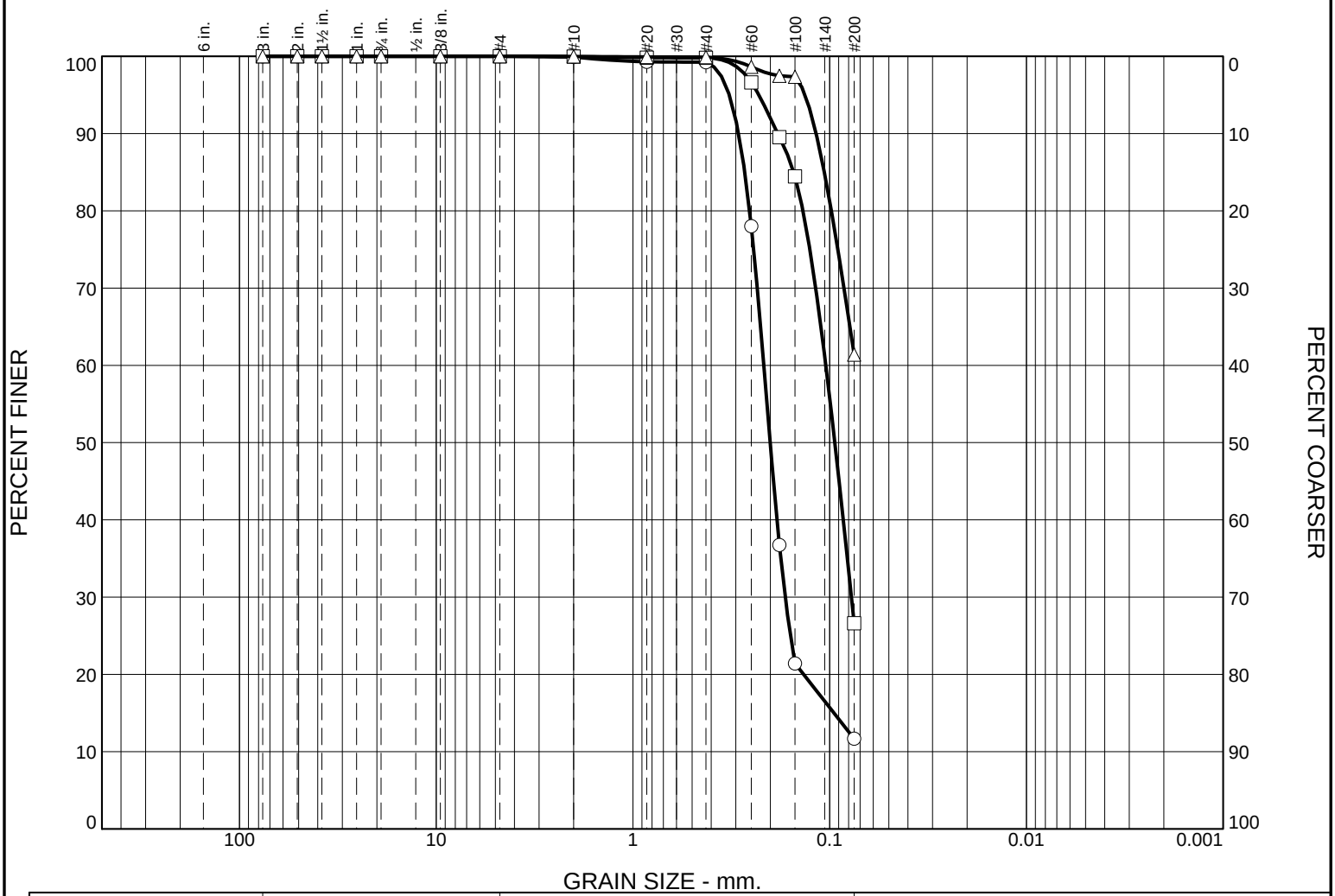
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	0.7	87.5	11.7	
□	0.0	0.0	0.0	0.0	0.2	73.2	26.6	
△	0.0	0.0	0.0	0.0	0.1	38.5	61.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.2698	0.2160	0.2005	0.1682	0.0950			
□	NP	NP	0.1522	0.1045	0.0941	0.0774				
△	26	17	0.1064							

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Tan to brown, POORLY GRADED SAND WITH SILT	09/01/2015	SP-SM	22.7
□ Gray, SILTY SAND, contains marine shell fragments	10/02/2015	SM	30.2
△ Gray, SANDY LEAN CLAY	09/01/2015	CL	24.3

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-52 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-52 **Depth:** 23.00-25.00 **Sample Number:** S-8

△ **Source of Sample:** BH-52 **Depth:** 28.00-30.00 **Sample Number:** S-9

Remarks:

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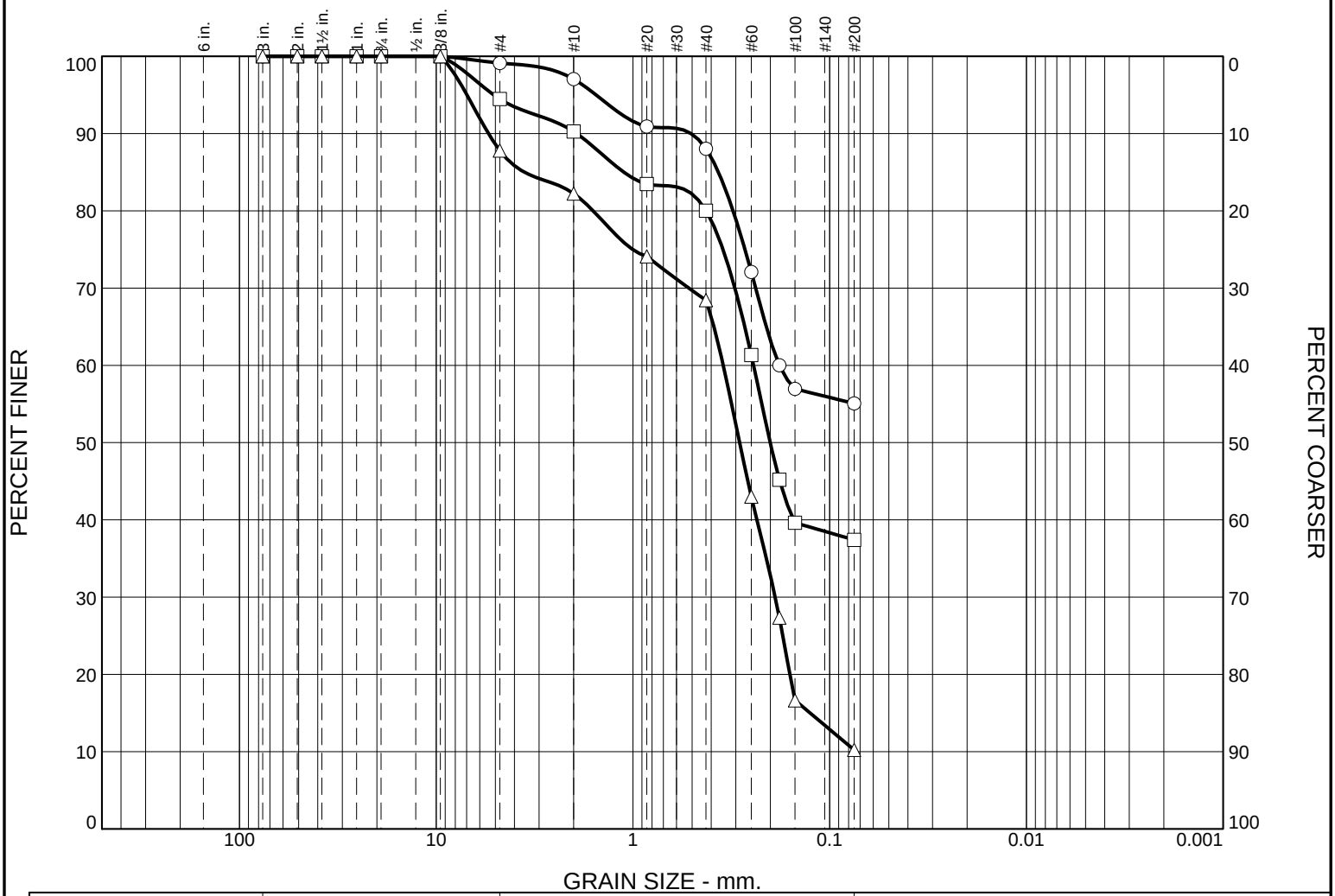
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.9	2.1	9.0	32.9	55.1	
□	0.0	0.0	5.5	4.2	10.3	42.6	37.4	
△	0.0	0.0	12.2	5.6	13.8	58.2	10.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	33	18	0.3673	0.1799						
□	28	13	1.1128	0.2435	0.2004					
△	NP	NP	3.5619	0.3473	0.2867	0.1890	0.1256			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SANDY LEAN CLAY	10/05/2015	CL	6.0
□ Brown, CLAYEY SAND	10/05/2015	SC	11.5
△ Gray, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	10.7

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-53 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-53 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-53 **Depth:** 4.00-6.00 **Sample Number:** S-3

Remarks:

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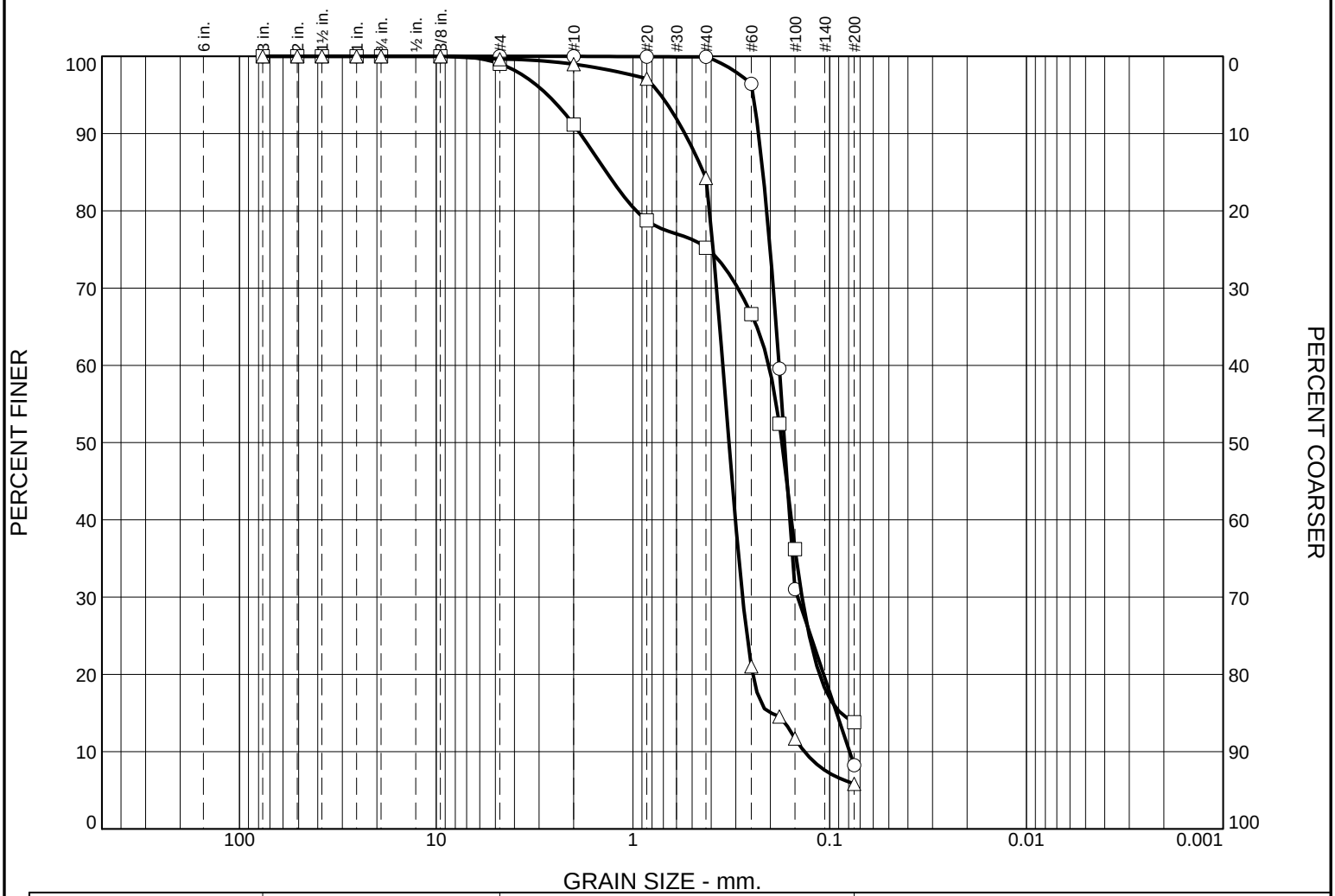
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	0.1	91.6	8.3	
□	0.0	0.0	1.0	7.8	16.0	61.4	13.8	
△	0.0	0.0	0.4	0.6	14.7	78.5	5.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.2182	0.1805	0.1696	0.1454	0.0921	0.0791	1.48	2.28
□	NP	NP	1.3628	0.2037	0.1747	0.1382	0.0877			
△	NP	NP	0.4376	0.3489	0.3247	0.2769	0.1992	0.1342	1.64	2.60

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	25.4
□ Gray, SILTY SAND	10/05/2015	SM	35.0
△ Gray, POORLY GRADED SAND WITH SILT, contains marine shell fragments	10/05/2015	SP-SM	23.9

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-53 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-53 **Depth:** 8.00-10.00 **Sample Number:** S-5

△ **Source of Sample:** BH-53 **Depth:** 13.00-15.00 **Sample Number:** S-6

Remarks:

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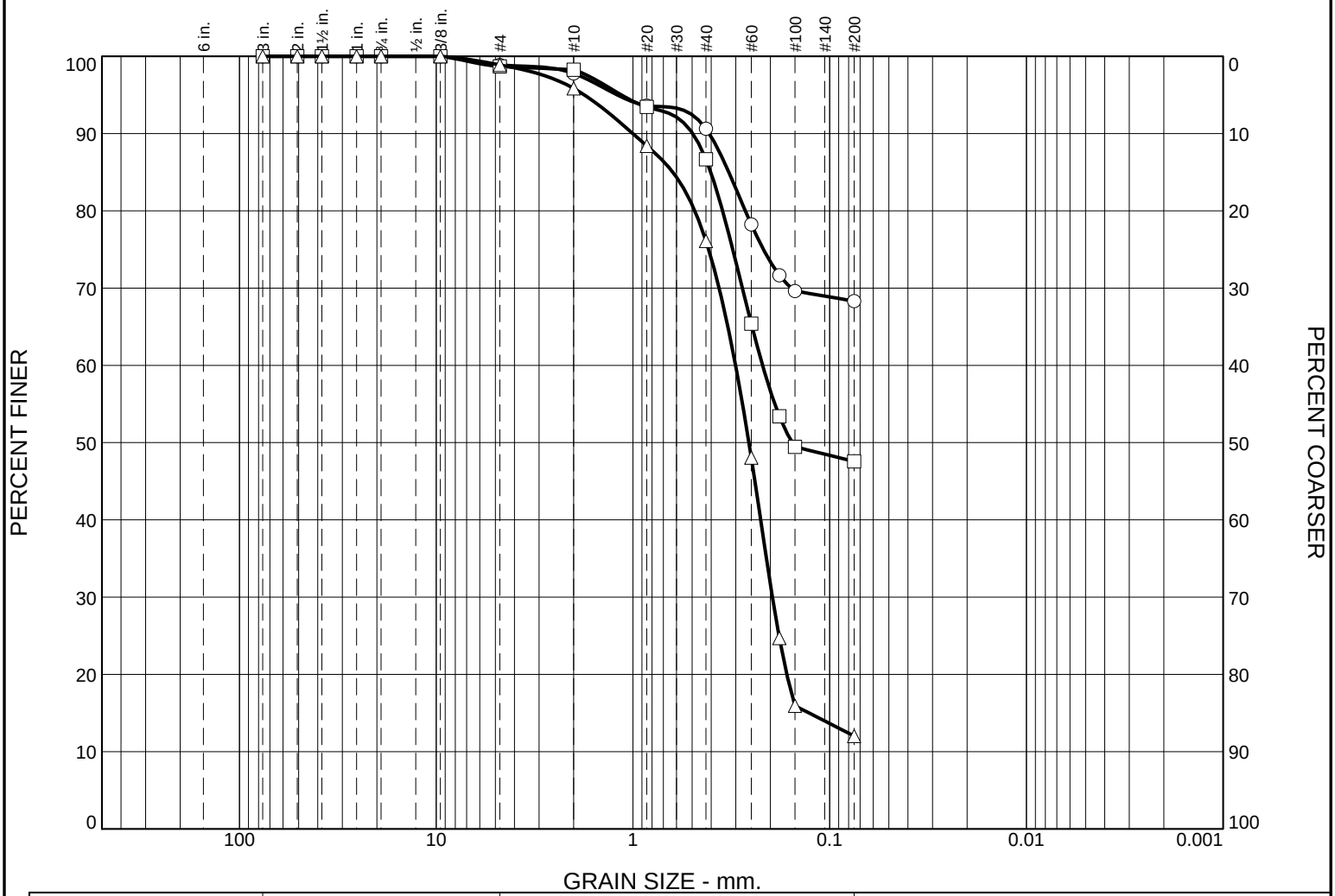
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.1	1.1	7.2	22.3	68.3	
□	0.0	0.0	1.3	0.4	11.6	39.1	47.6	
△	0.0	0.0	1.1	3.1	19.7	64.1	12.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	22	15	0.3254							
□			0.4018	0.2191	0.1549					
△	24	18	0.6267	0.3006	0.2570	0.1953	0.1270			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, SANDY LEAN CLAY/SILT	10/05/2015	CL-ML	8.7
□ Brown, CLAYEY SAND	10/05/2015	SC	9.4
△ Gray-brown, POORLY GRADED SAND WITH CLAY	10/05/2015	SP-SC	15.5

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-54 **Depth:** 0.00-2.00 **Sample Number:** S-1

□ **Source of Sample:** BH-54 **Depth:** 2.00-4.00 **Sample Number:** S-2

△ **Source of Sample:** BH-54 **Depth:** 4.00-6.00 **Sample Number:** S-3

Remarks:

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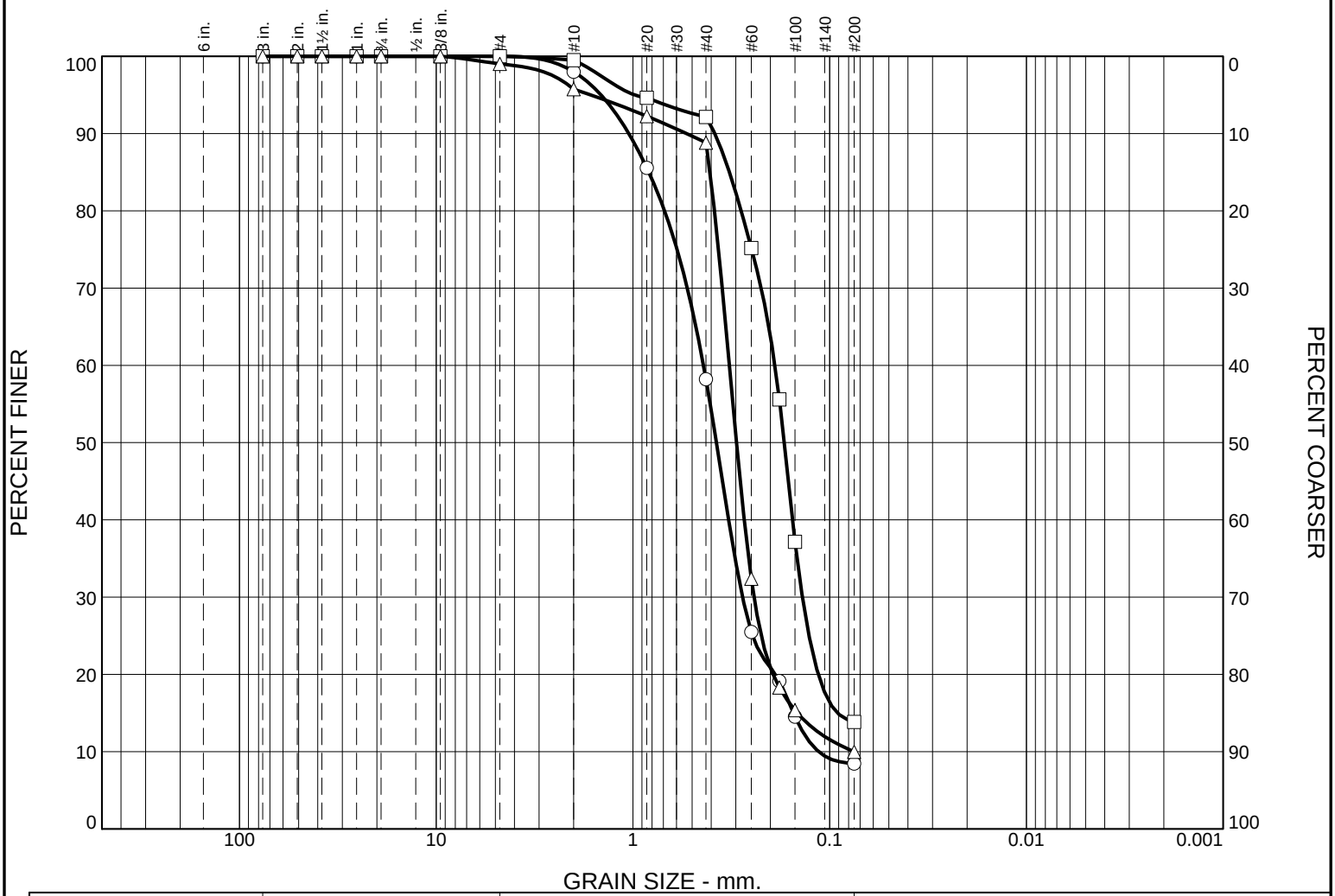
Figure

Tested By: hmr **Checked By:** rjw

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.0	39.8	49.7	8.5	
□	0.0	0.0	0.0	0.5	7.4	78.3	13.8	
△	0.0	0.0	1.0	3.3	6.9	78.8	10.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NP	NP	0.8305	0.4375	0.3762	0.2769	0.1528	0.1136	1.54	3.85
□	NP	NP	0.3232	0.1896	0.1700	0.1376	0.0911			
△	NP	NP	0.4056	0.3233	0.2973	0.2422	0.1458	0.0751	2.42	4.30

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ Gray, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	17.6
□ Gray, SILTY SAND, contains marine shell fragments	10/05/2015	SM	23.5
△ Gray, POORLY GRADED SAND WITH SILT	10/05/2015	SP-SM	20.2

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

○ **Source of Sample:** BH-54 **Depth:** 6.00-8.00 **Sample Number:** S-4

□ **Source of Sample:** BH-54 **Depth:** 8.00-10.00 **Sample Number:** S-5

△ **Source of Sample:** BH-54 **Depth:** 13.00-15.00 **Sample Number:** S-6

Remarks:

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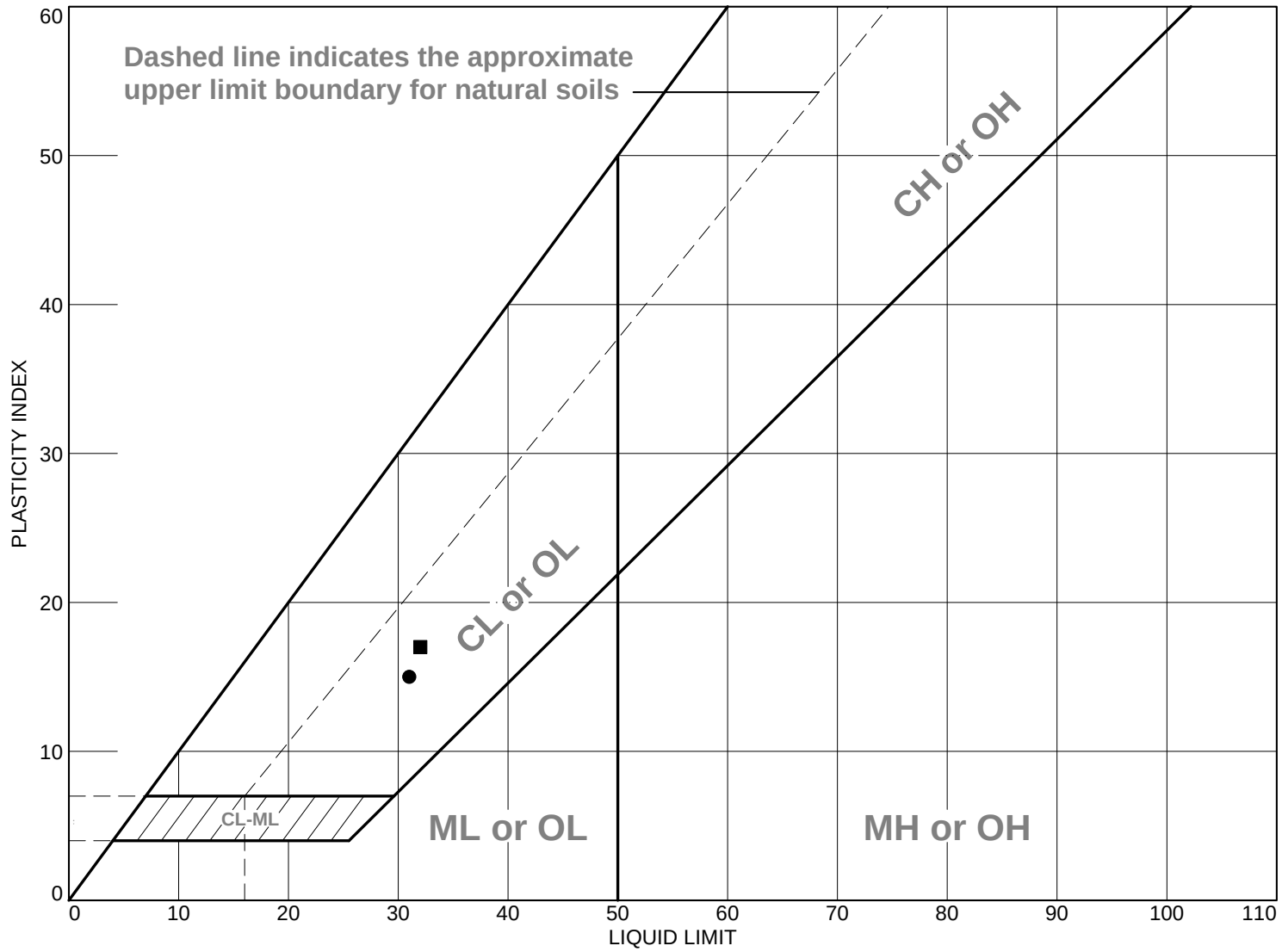
Figure

Tested By: hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown mottled orange, SANDY LEAN CLAY	31	16	15	99.1	67.1	CL
■	Brown mottled orange, SANDY LEAN CLAY	32	15	17	99.4	57.8	CL
▲	Brown, SILTY SAND	NP	NP	NP	98.5	42.5	SM
◆	Brown, SILTY SAND	NP	NP	NP	97.8	27.7	SM
▼	Brown, SILTY SAND	NP	NP	NP	91.6	25.3	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-01 **Depth:** 0.00-2.00 **Sample Number:** S-1
■ **Source of Sample:** BH-01 **Depth:** 2.00-4.00 **Sample Number:** S-2
▲ **Source of Sample:** BH-01 **Depth:** 4.00-6.00 **Sample Number:** S-3
◆ **Source of Sample:** BH-01 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-01 **Depth:** 8.00-10.00 **Sample Number:** S-5

Remarks:

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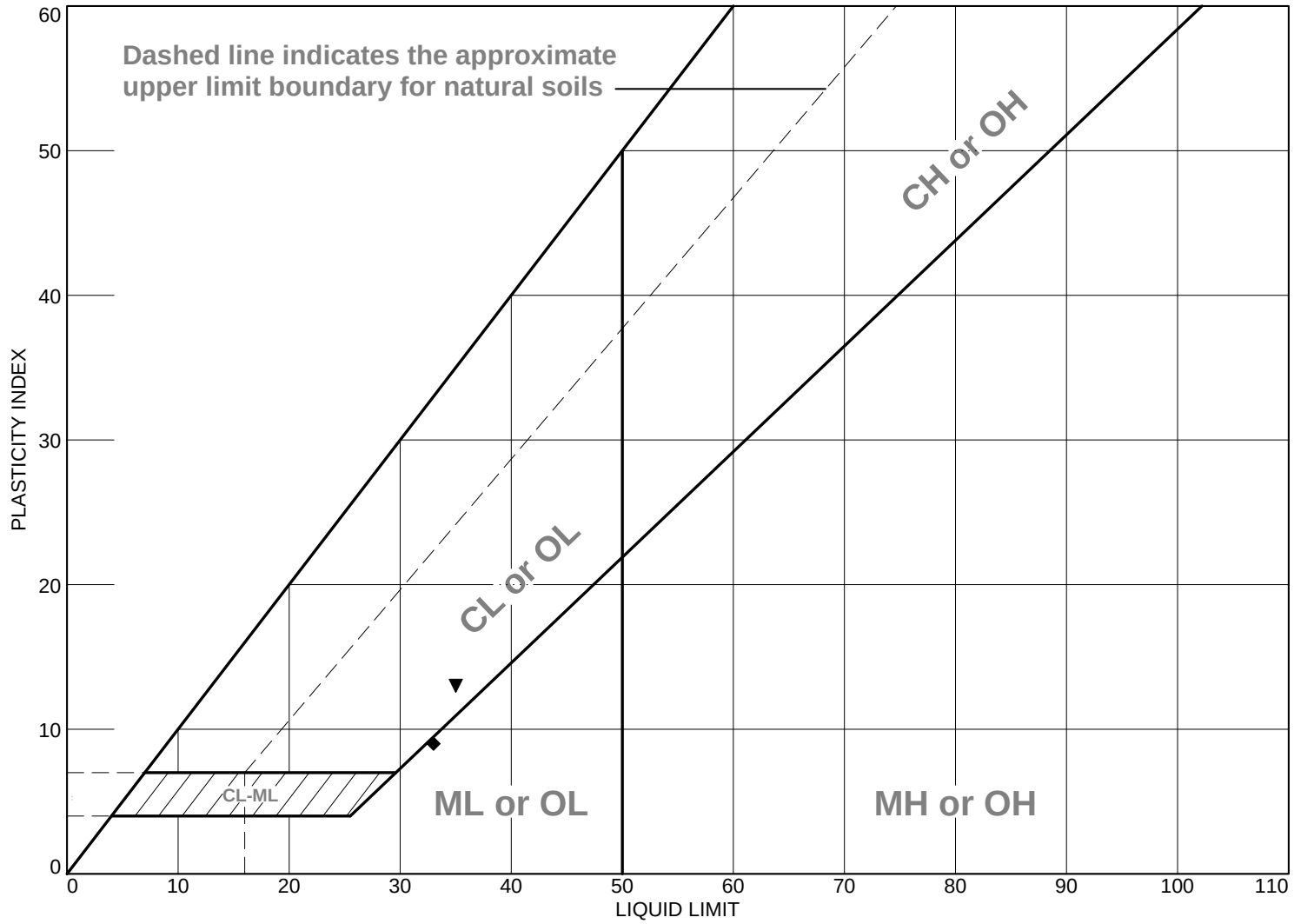
Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown-orange, POORLY GRADED SAND WITH SILT	NP	NP	NP	22.5	5.1	SP-SM
■	Brown, SILTY SAND	NP	NP	NP	94.9	27.4	SM
▲	Light brown, SILTY SAND	NP	NP	NP	98.5	16.8	SM
◆	Gray, CLAYEY SAND	33	24	9	99.7	48.5	SC
▼	Gray, LEAN CLAY WITH SAND, contains marine shell fragments	35	22	13	97.3	79.4	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-01 **Depth:** 13.00-15.00 **Sample Number:** S-6
■ **Source of Sample:** BH-02 **Depth:** 2.00-4.00 **Sample Number:** S-2
▲ **Source of Sample:** BH-02 **Depth:** 6.00-8.00 **Sample Number:** S-4
◆ **Source of Sample:** BH-02 **Depth:** 23.00-25.00 **Sample Number:** S-8
▼ **Source of Sample:** BH-02 **Depth:** 33.00-35.00 **Sample Number:** S-10

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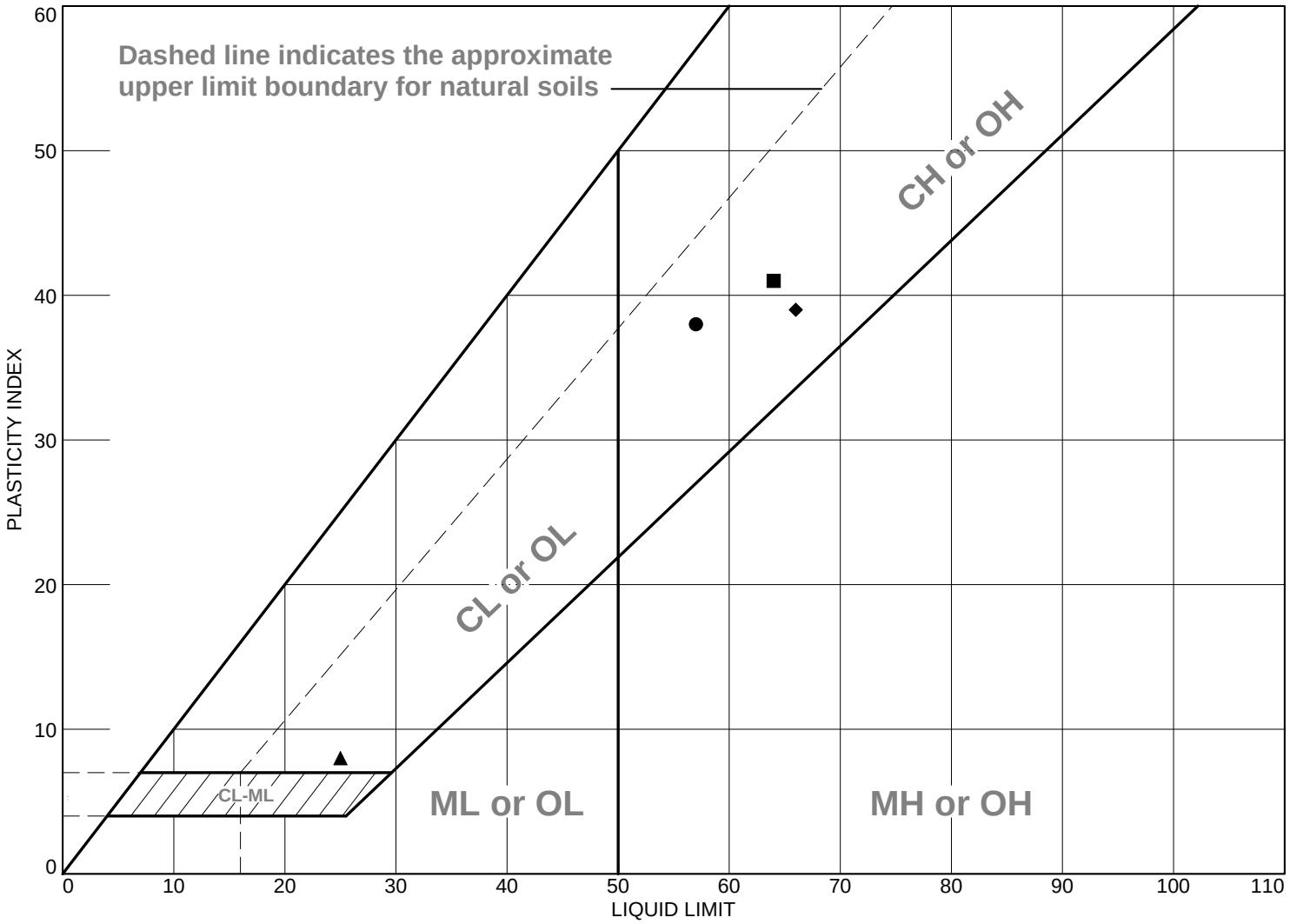
Remarks:

Figure

Tested By: ■ tl ▲ TL ◆ tl ▼ tl **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark gray, FAT CLAY, trace marine shell fragments	57	19	38	98.8	95.4	CH
■	Dark gray, FAT CLAY, contains marine shell fragments	64	23	41	99.3	96.0	CH
▲	Gray, CLAYEY SAND	25	17	8	99.7	33.1	SC
◆	Gray, FAT CLAY	66	27	39	99.2	91.0	CH
▼	Gray, SILTY SAND	NP	NP	NP	99.7	17.4	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-02 **Depth:** 43.00-45.00 **Sample Number:** S-12
■ **Source of Sample:** BH-02 **Depth:** 53.00-55.00 **Sample Number:** S-14
▲ **Source of Sample:** BH-02 **Depth:** 58.00-60.00 **Sample Number:** S-15
◆ **Source of Sample:** BH-02 **Depth:** 78.00-80.00 **Sample Number:** S-19
▼ **Source of Sample:** BH-03 **Depth:** 18.00-20.00 **Sample Number:** S-7

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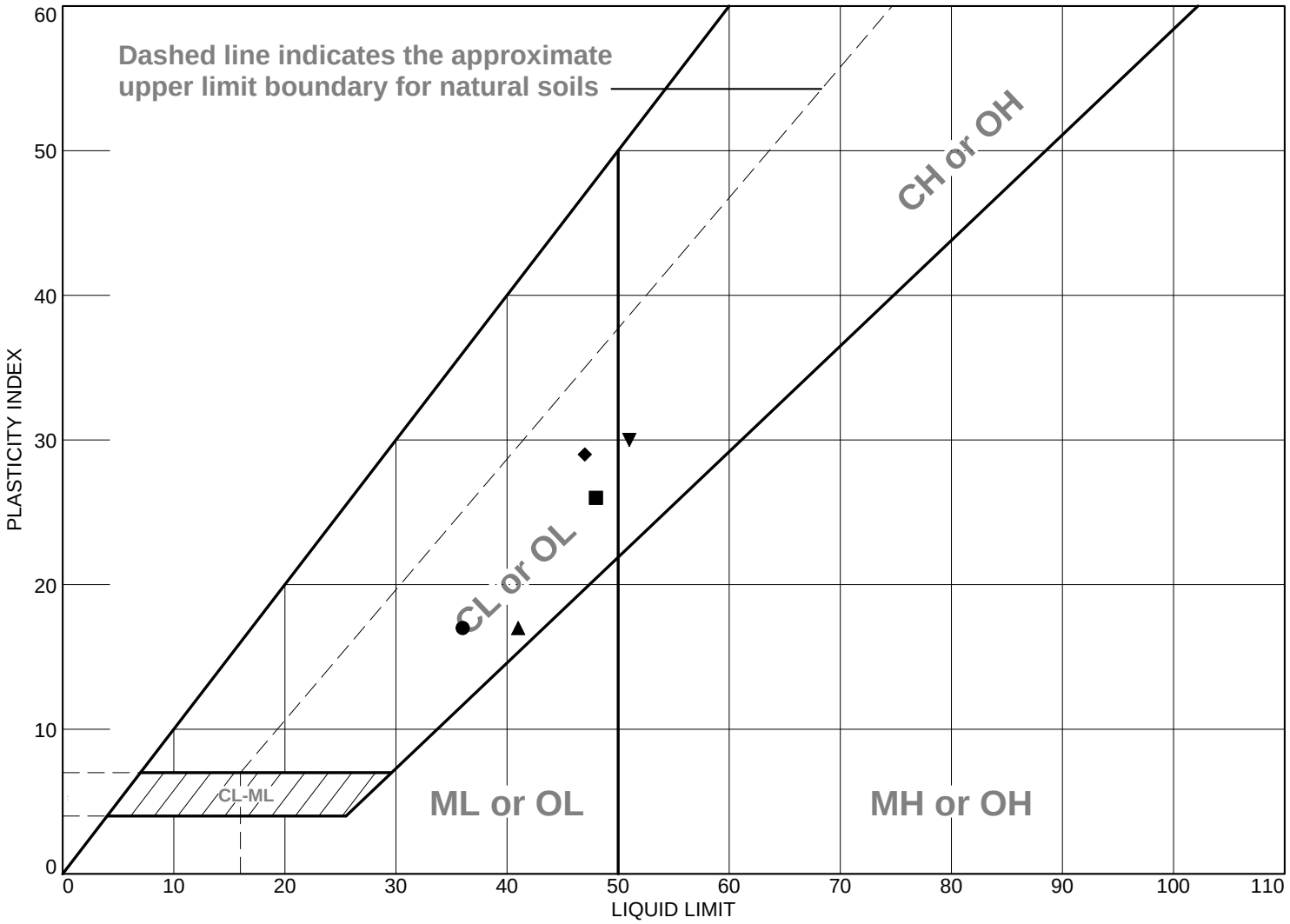
Remarks:

Figure

Tested By: tl **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange mottled gray, LEAN CLAY	36	19	17	100.0	93.3	CL
■	Gray, SANDY LEAN CLAY	48	22	26	98.0	62.2	CL
▲	Gray, SANDY LEAN CLAY, contains marine shell fragments	41	24	17	97.2	78.6	CL
◆	Gray, SANDY LEAN CLAY, contains marine shell fragments	47	18	29	97.1	79.1	CL
▼	Gray, FAT CLAY WITH SAND	51	21	30	98.8	74.2	CH

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-03 **Depth:** 2.00-4.00 **Sample Number:** S-2
■ **Source of Sample:** BH-03 **Depth:** 23.00-25.00 **Sample Number:** S-8
▲ **Source of Sample:** BH-03 **Depth:** 33.00-35.00 **Sample Number:** S-10
◆ **Source of Sample:** BH-03 **Depth:** 48.00-50.00 **Sample Number:** S-13
▼ **Source of Sample:** BH-03 **Depth:** 63.00-65.00 **Sample Number:** S-16

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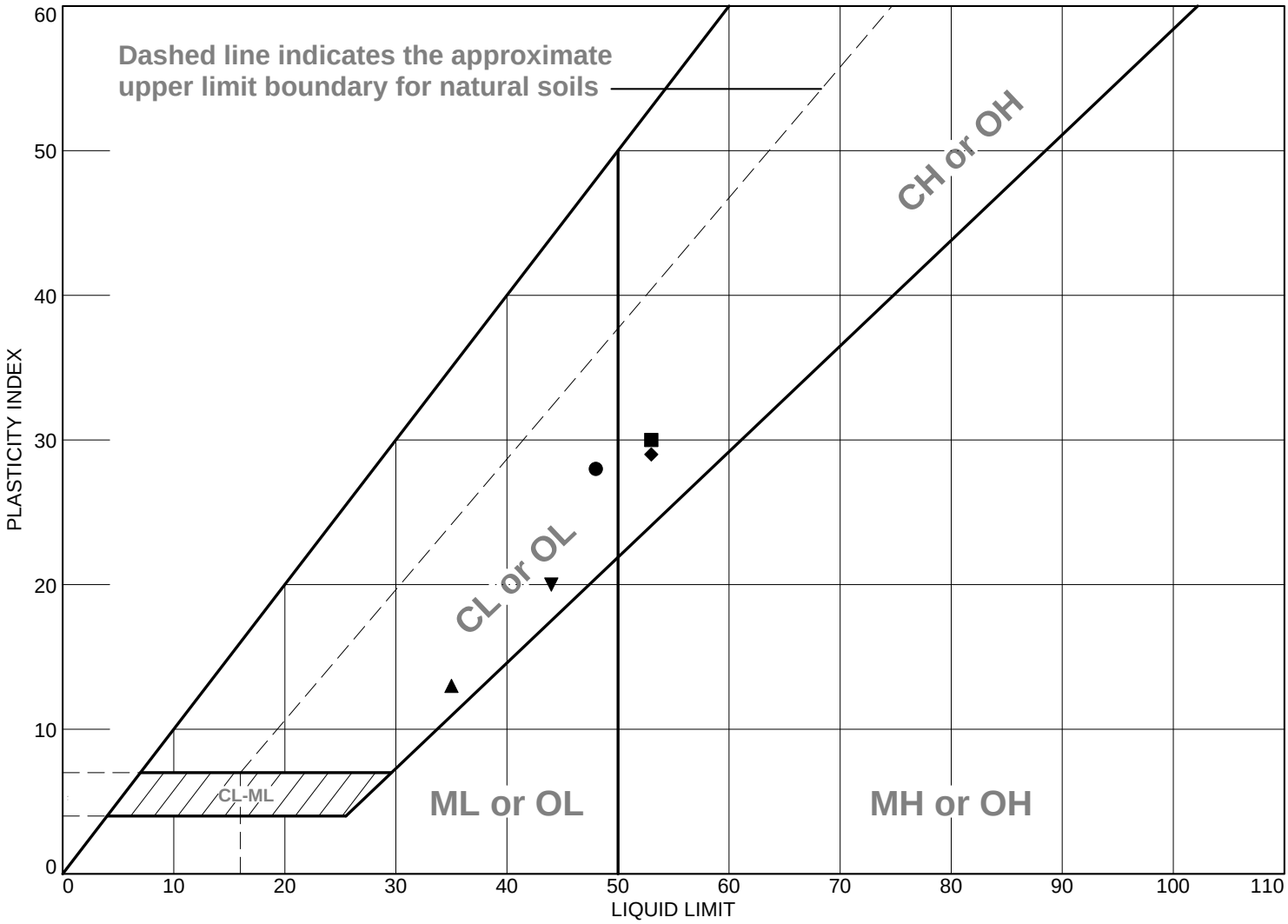
Remarks:

Figure

Tested By: tl **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, SANDY LEAN CLAY	48	20	28	99.4	71.2	CL
■	Gray, SANDY FAT CLAY	53	23	30	98.5	66.2	CH
▲	Brown, SANDY LEAN CLAY	35	22	13	99.9	68.2	CL
◆	Gray, SANDY FAT CLAY, contains marine shell fragments	53	24	29	99.3	61.1	CH
▼	Gray, LEAN CLAY	44	24	20	97.8	85.2	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-03 **Depth:** 58.00-60.00 **Sample Number:** S-15
■ **Source of Sample:** BH-03 **Depth:** 73.00-75.00 **Sample Number:** S-18
▲ **Source of Sample:** BH-04 **Depth:** 6.00-8.00 **Sample Number:** S-4
◆ **Source of Sample:** BH-04 **Depth:** 23.00-25.00 **Sample Number:** S-8
▼ **Source of Sample:** BH-04 **Depth:** 38.00-40.00 **Sample Number:** S-12

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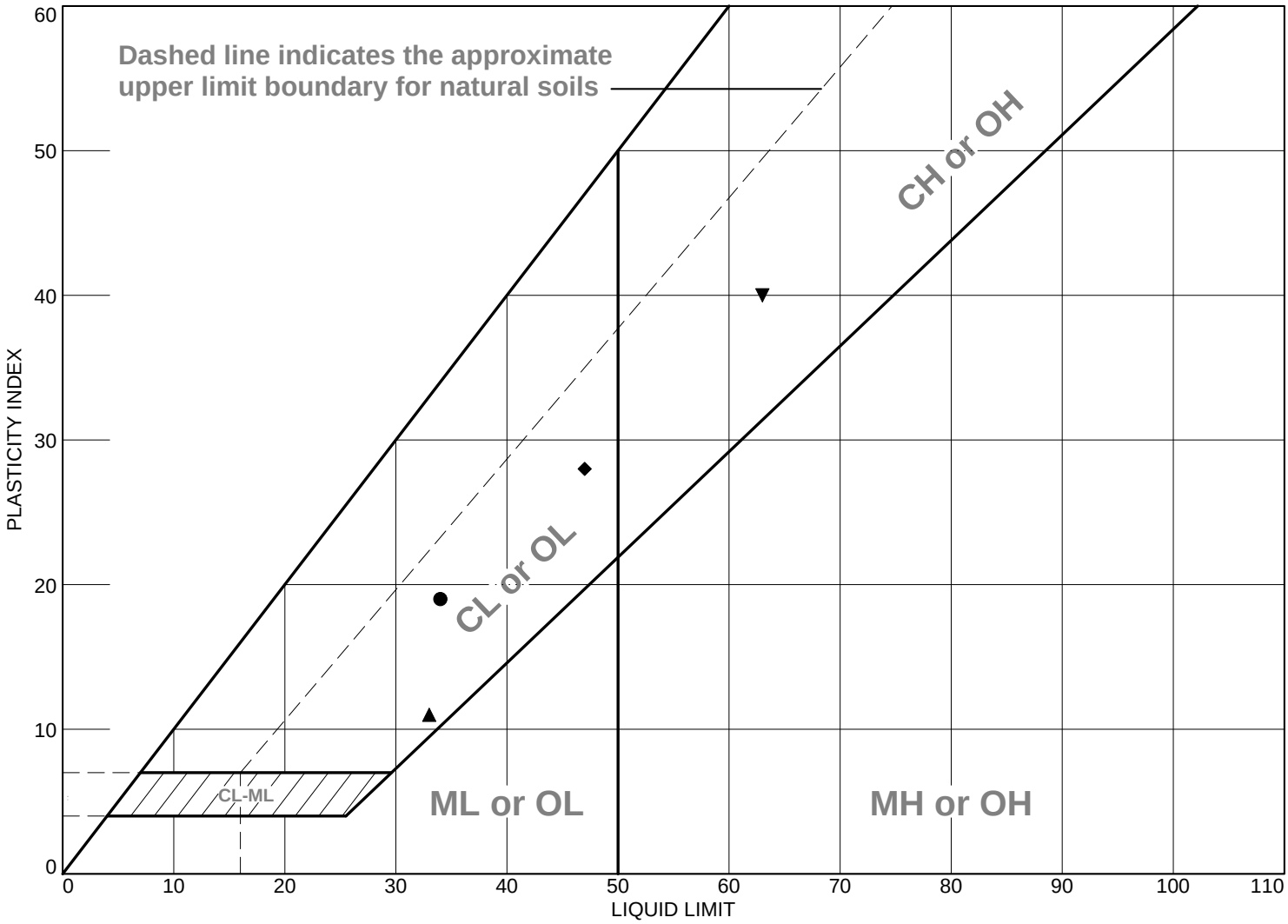
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown, CLAYEY SAND	34	15	19	99.1	49.3	SC
■	Gray, SILTY SAND	NP	NP	NP	99.7	12.3	SM
▲	Gray, LEAN CLAY WITH SAND, contains marine shell fragments	33	22	11	96.3	77.4	CL
◆	Gray, LEAN CLAY	47	19	28	97.7	91.7	CL
▼	Gray, FAT CLAY WITH SAND	63	23	40	99.8	77.6	CH

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-04 **Depth:** 2.00-4.00 **Sample Number:** S-2
■ **Source of Sample:** BH-04 **Depth:** 18.00-20.00 **Sample Number:** S-7
▲ **Source of Sample:** BH-04 **Depth:** 35.00-37.00 **Sample Number:** S-11
◆ **Source of Sample:** BH-04 **Depth:** 48.00-50.00 **Sample Number:** S-14
▼ **Source of Sample:** BH-04 **Depth:** 58.00-60.00 **Sample Number:** S-16

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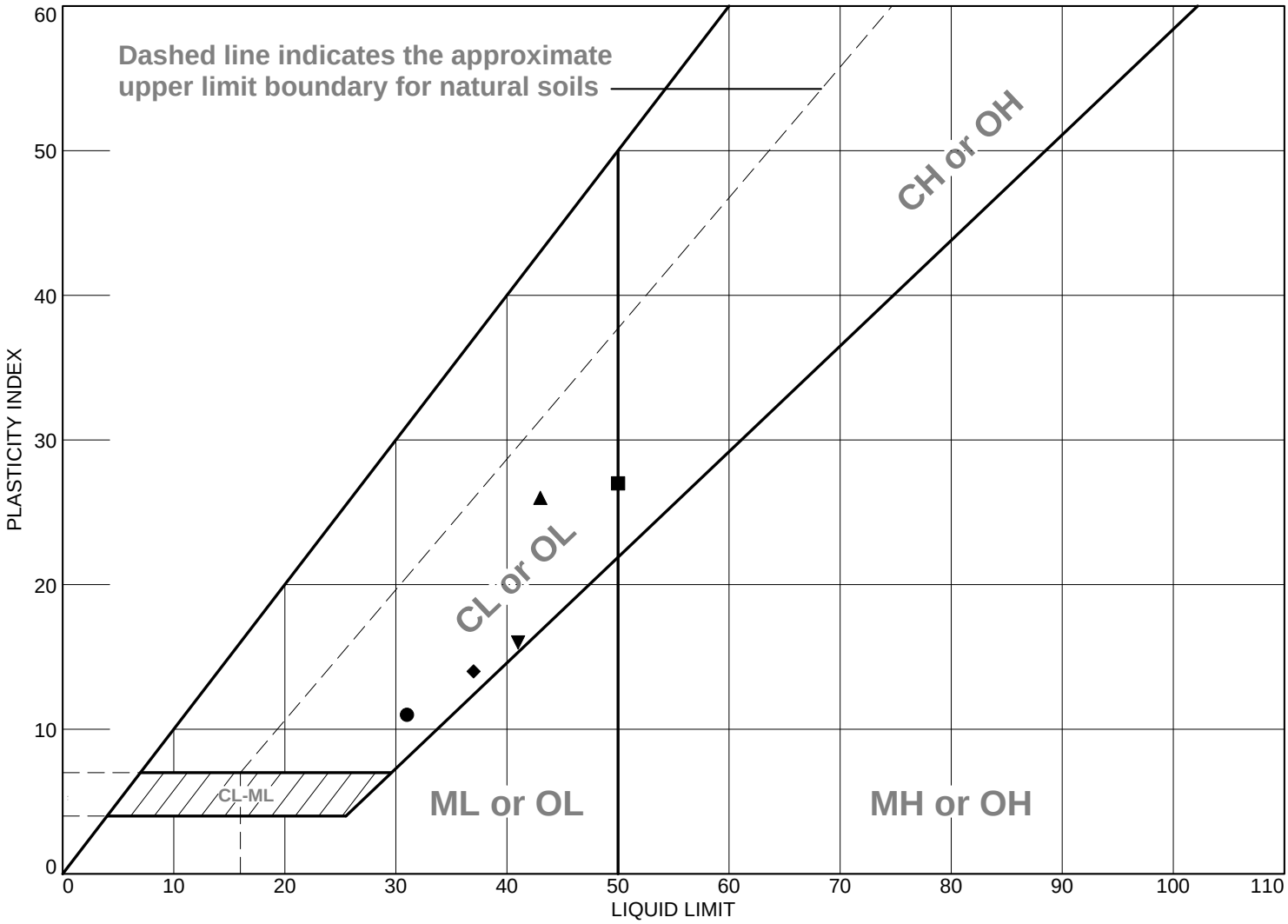
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, CLAYEY SAND	31	20	11	99.7	28.0	SC
■	Orange-brown, FAT CLAY	50	23	27	97.3	86.8	CH
▲	Orange-brown, LEAN CLAY WITH SAND	43	17	26	99.3	72.8	CL
◆	Gray, CLAYEY SAND, contains marine shell fragments	37	23	14	93.7	49.7	SC
▼	Gray, LEAN CLAY WITH SAND	41	25	16	97.7	81.8	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-04 **Depth:** 68.00-70.00 **Sample Number:** S-18
■ **Source of Sample:** BH-05 **Depth:** 6.00-8.00 **Sample Number:** S-4
▲ **Source of Sample:** BH-05 **Depth:** 8.00-10.00 **Sample Number:** S-5
◆ **Source of Sample:** BH-05 **Depth:** 33.00-35.00 **Sample Number:** S-10
▼ **Source of Sample:** BH-05 **Depth:** 38.00-40.00 **Sample Number:** S-11

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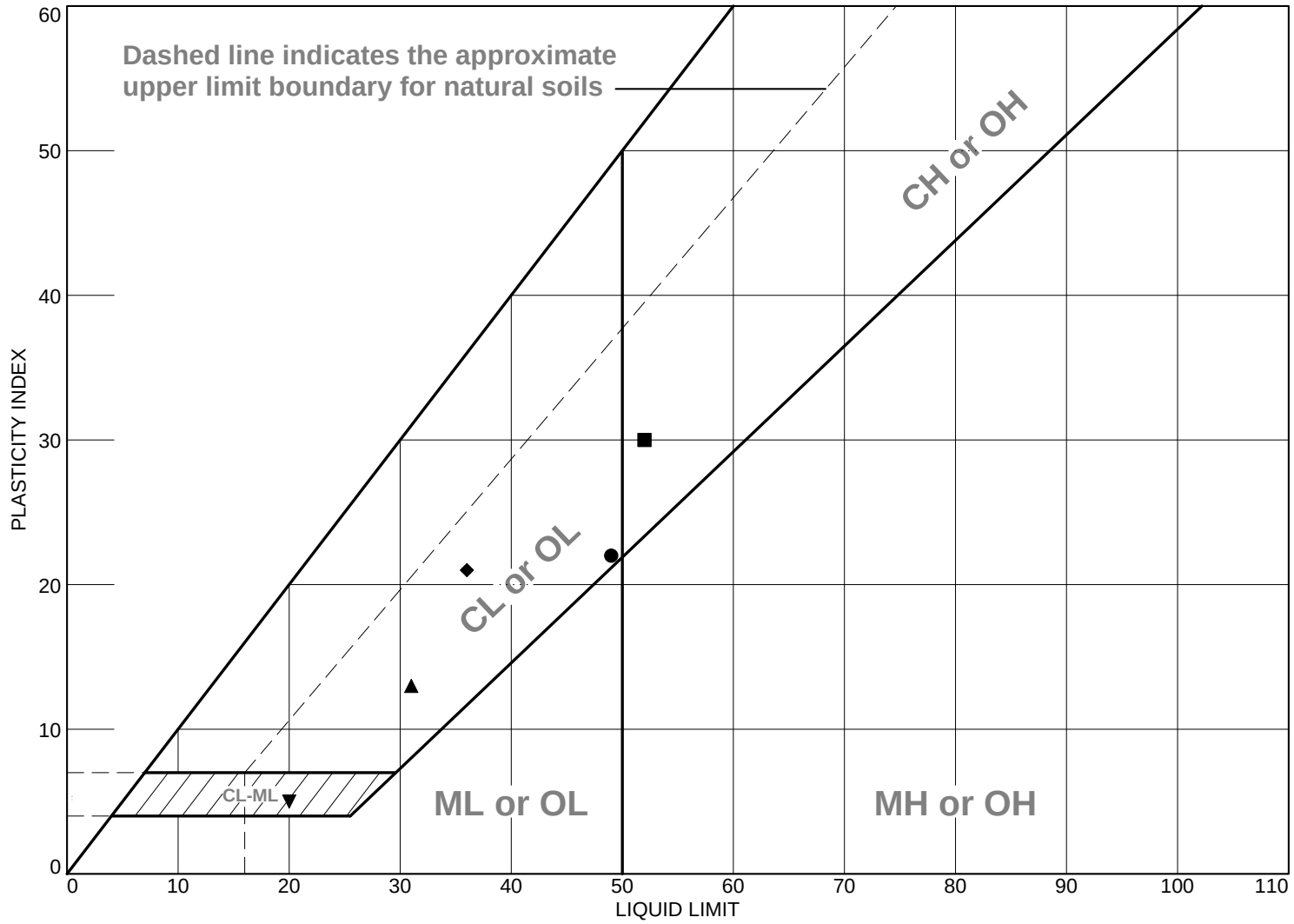
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, LEAN CLAY	49	27	22	98.6	93.7	CL
■	Gray, SANDY FAT CLAY, contains marine shell fragments	52	22	30	98.1	62.6	CH
▲	Gray, CLAYEY SAND	31	18	13	98.1	40.8	SC
◆	Gray, CLAYEY SAND	36	15	21	99.6	39.1	SC
▼	Brown mottled orange, CLAYEY/SILTY SAND	20	15	5	99.5	40.9	SC-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-05 **Depth:** 48.00-50.00 **Sample Number:** S-13
■ **Source of Sample:** BH-05 **Depth:** 58.00-60.00 **Sample Number:** S-15
▲ **Source of Sample:** BH-05 **Depth:** 63.00-65.00 **Sample Number:** S-16
◆ **Source of Sample:** BH-05 **Depth:** 78.00-80.00 **Sample Number:** S-19
▼ **Source of Sample:** BH-06 **Depth:** 4.00-6.00 **Sample Number:** S-3

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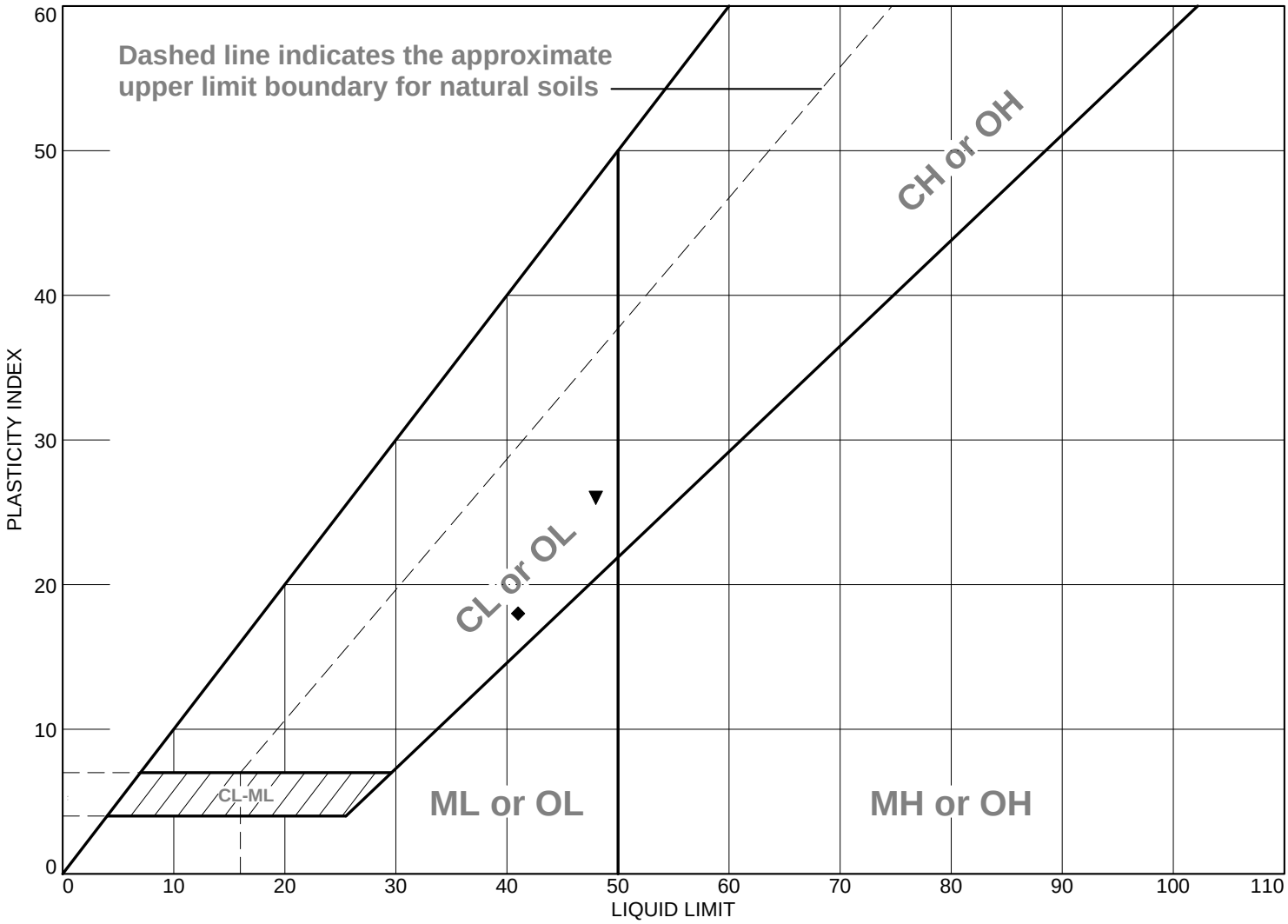
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange-brown, POORLY GRADED SAND WITH SILT	NP	NP	NP	70.1	10.1	SP-SM
■	Tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	75.9	6.0	SP-SM
▲	Tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.6	7.5	SP-SM
◆	Gray, LEAN CLAY WITH SAND, contains marine shell fragments	41	23	18	97.1	81.4	CL
▼	Gray, LEAN CLAY	48	22	26	98.3	93.1	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-06 **Depth:** 6.00-8.00 **Sample Number:** S-4
■ **Source of Sample:** BH-06 **Depth:** 18.00-20.00 **Sample Number:** S-7
▲ **Source of Sample:** BH-06 **Depth:** 33.00-35.00 **Sample Number:** S-10
◆ **Source of Sample:** BH-06 **Depth:** 43.00-45.00 **Sample Number:** S-12
▼ **Source of Sample:** BH-06 **Depth:** 45.00-47.00 **Sample Number:** S-13

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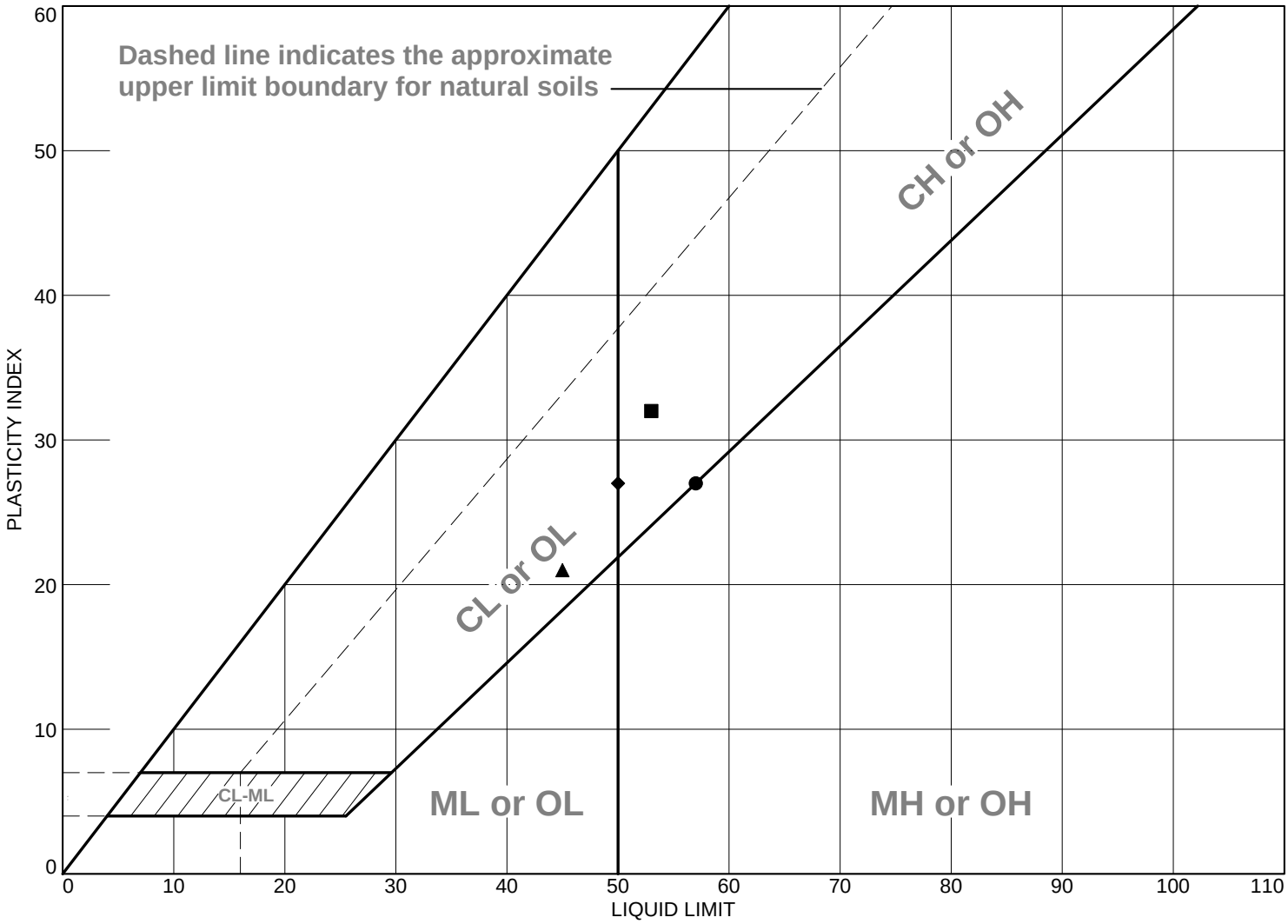
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, FAT CLAY WITH SAND	57	30	27	92.1	72.2	CH
■	Gray, SANDY FAT CLAY	53	21	32	99.0	55.9	CH
▲	Gray, CLAYEY SAND	45	24	21	95.9	33.6	SC
◆	Gray mottled orange, FAT CLAY	50	23	27	99.4	88.6	CH
▼	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	94.3	8.7	SP-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-06 **Depth:** 48.00-50.00 **Sample Number:** S-14
■ **Source of Sample:** BH-06 **Depth:** 53.00-55.00 **Sample Number:** S-15
▲ **Source of Sample:** BH-06 **Depth:** 78.00-80.00 **Sample Number:** S-20
◆ **Source of Sample:** BH-07 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-07 **Depth:** 18.0-20.0 **Sample Number:** S-7

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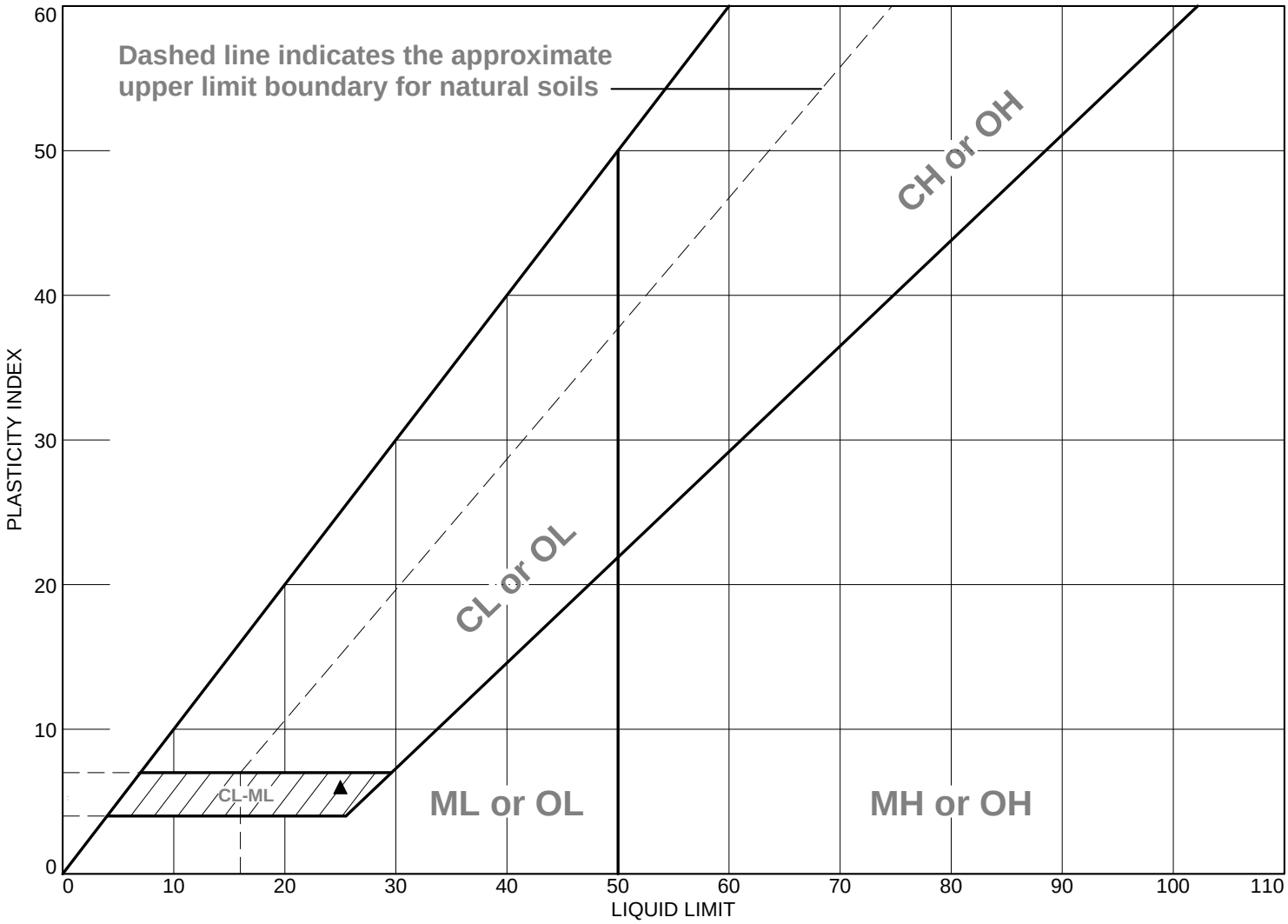
Tested By: ◆ da ▼ hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Yellow-tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	100.0	5.7	SP-SM
■	Yellow-tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.9	7.7	SP-SM
▲	Gray, CLAYEY/SILTY SAND	25	19	6	99.9	28.1	SC-SM
◆	Gray, SILTY SAND	NP	NP	NP	99.9	12.1	SM
▼	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	42.1	10.9	SP-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-07 **Depth:** 33.0-35.0 **Sample Number:** S-10
■ **Source of Sample:** BH-07 **Depth:** 43.0-45.0 **Sample Number:** S-12
▲ **Source of Sample:** BH-07 **Depth:** 63.0-65.0 **Sample Number:** S-16
◆ **Source of Sample:** BH-07 **Depth:** 73.0-75.0 **Sample Number:** S-18
▼ **Source of Sample:** BH-07 **Depth:** 78.0-80.0 **Sample Number:** S-19

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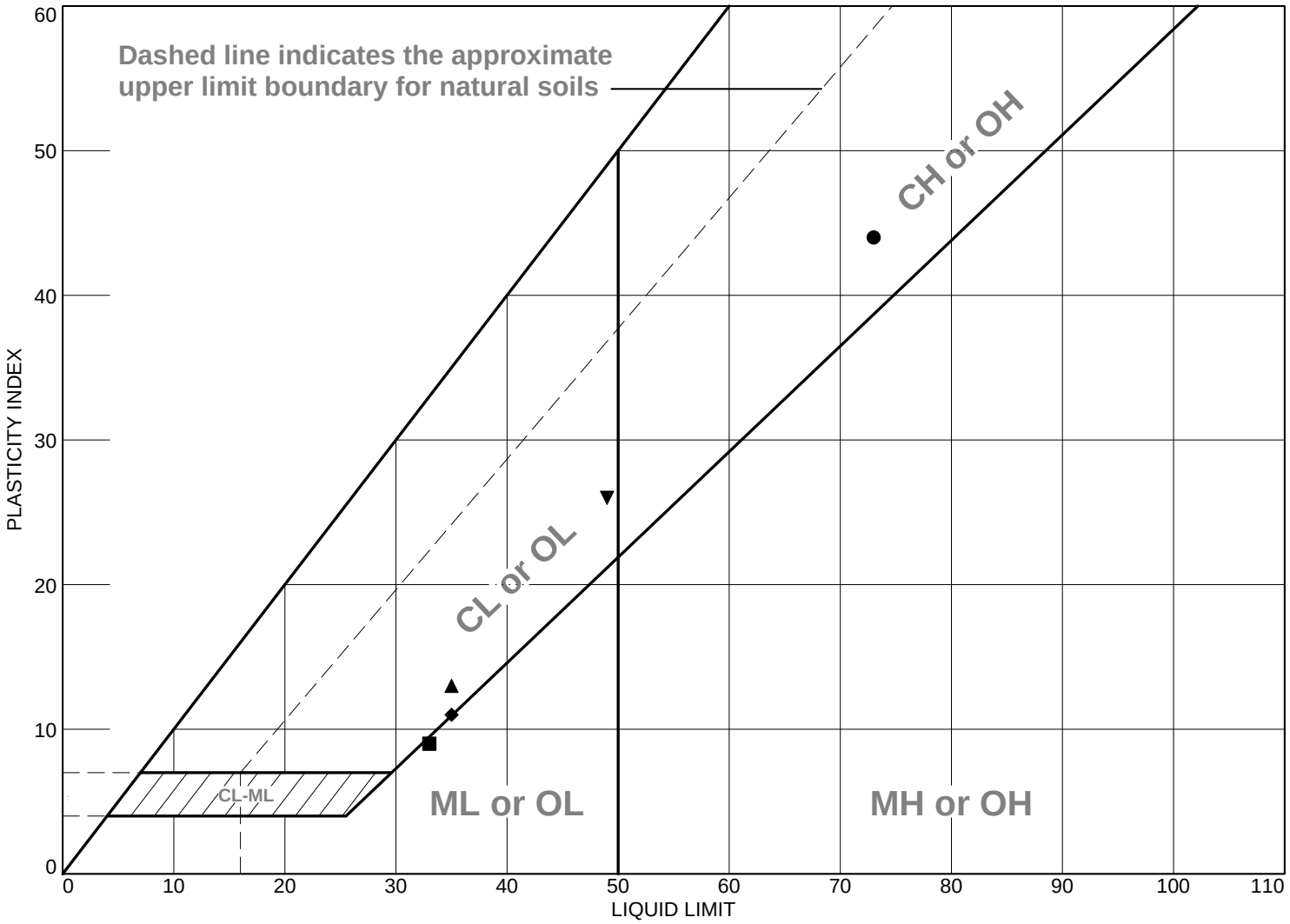
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown-gray, CLAYEY SAND	73	29	44	92.6	38.6	SC
■	Gray, SANDY LEAN CLAY	33	24	9	99.9	60.9	CL
▲	Tan-orange, LEAN CLAY WITH SAND	35	22	13	99.6	71.7	CL
◆	Gray, SANDY LEAN CLAY	35	24	11	99.4	53.9	CL
▼	Gray, LEAN CLAY	49	23	26	100.0	89.1	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-09 **Depth:** 6.00-8.00 **Sample Number:** S-4
■ **Source of Sample:** BH-09 **Depth:** 33.00-35.00 **Sample Number:** S-10
▲ **Source of Sample:** BH-10 **Depth:** 6.00-8.00 **Sample Number:** S-4
◆ **Source of Sample:** BH-10 **Depth:** 48.00-50.00 **Sample Number:** S-13
▼ **Source of Sample:** BH-11 **Depth:** 18.00-20.00 **Sample Number:** S-7

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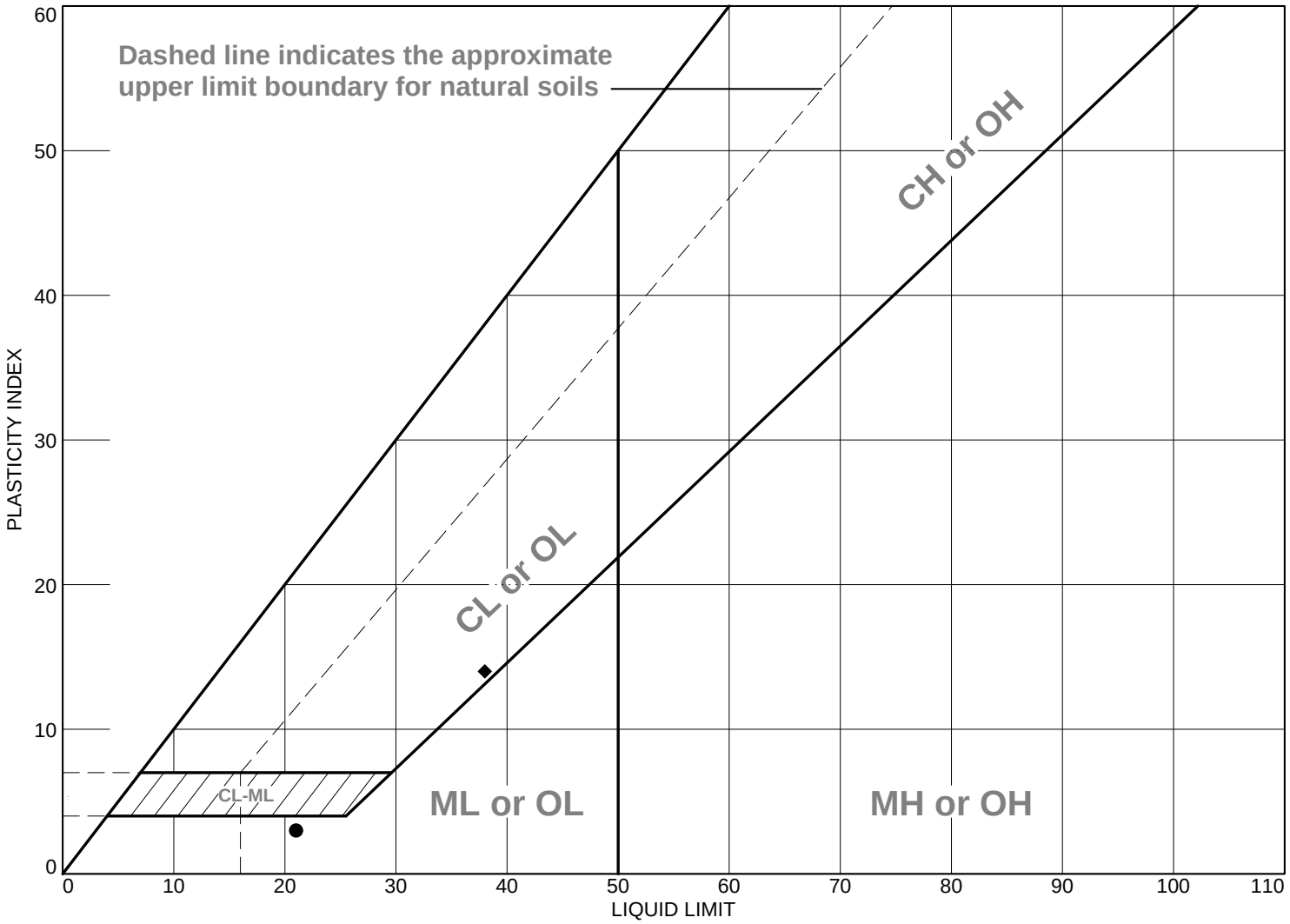
Remarks:

Figure

Tested By: da **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Tan, SILTY SAND	21	18	3	99.4	26.8	SM
■	Light-brown, SILTY SAND	NP	NP	NP	96.7	14.3	SM
▲	Gray, SILTY SAND	NP	NP	NP	99.6	13.6	SM
◆	Tan mottled orange, LEAN CLAY	38	24	14	99.9	91.5	CL
▼	Tan to gray, SILTY SAND	NP	NP	NP	94.5	17.9	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-13 **Depth:** 2.00-4.00 **Sample Number:** S-2
■ **Source of Sample:** BH-13 **Depth:** 6.00-8.00 **Sample Number:** S-4
▲ **Source of Sample:** BH-13 **Depth:** 18.00-20.00 **Sample Number:** S-7
◆ **Source of Sample:** BH-13 **Depth:** 23.00-25.00 **Sample Number:** S-8
▼ **Source of Sample:** BH-15 **Depth:** 0.00-2.00 **Sample Number:** S-1

Remarks:

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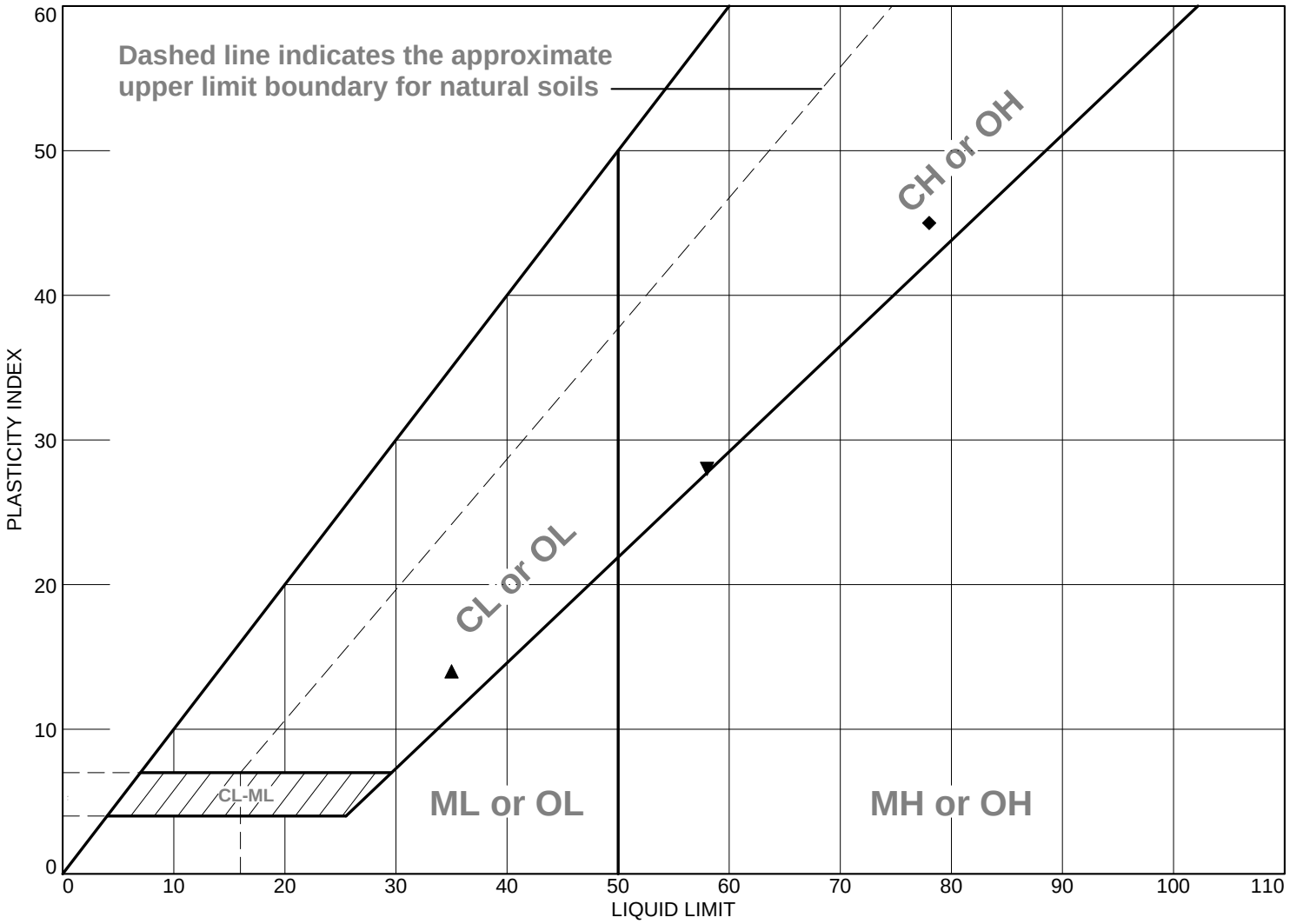
Tested By: ● da ■ hmr ▲ hmr ▼ rjw **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray-tan, SILTY SAND, contains marine shell fragments	NP	NP	NP	98.4	17.1	SM
■	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.5	9.9	SP-SM
▲	Gray, LEAN CLAY WITH SAND	35	21	14	99.8	71.7	CL
◆	Gray, FAT CLAY, contains marine shell fragments	78	33	45	99.8	93.8	CH
▼	Brown mottled orange, FAT CLAY WITH SAND	58	30	28	96.7	78.4	CH

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-15 **Depth:** 18.00-20.00 **Sample Number:** S-7
■ **Source of Sample:** BH-15 **Depth:** 33.00-35.00 **Sample Number:** S-10
▲ **Source of Sample:** BH-18 **Depth:** 43.00-45.00 **Sample Number:** S-12
◆ **Source of Sample:** BH-18 **Depth:** 63.00-65.00 **Sample Number:** S-16
▼ **Source of Sample:** BH-20 **Depth:** 6.00-8.00 **Sample Number:** S-4

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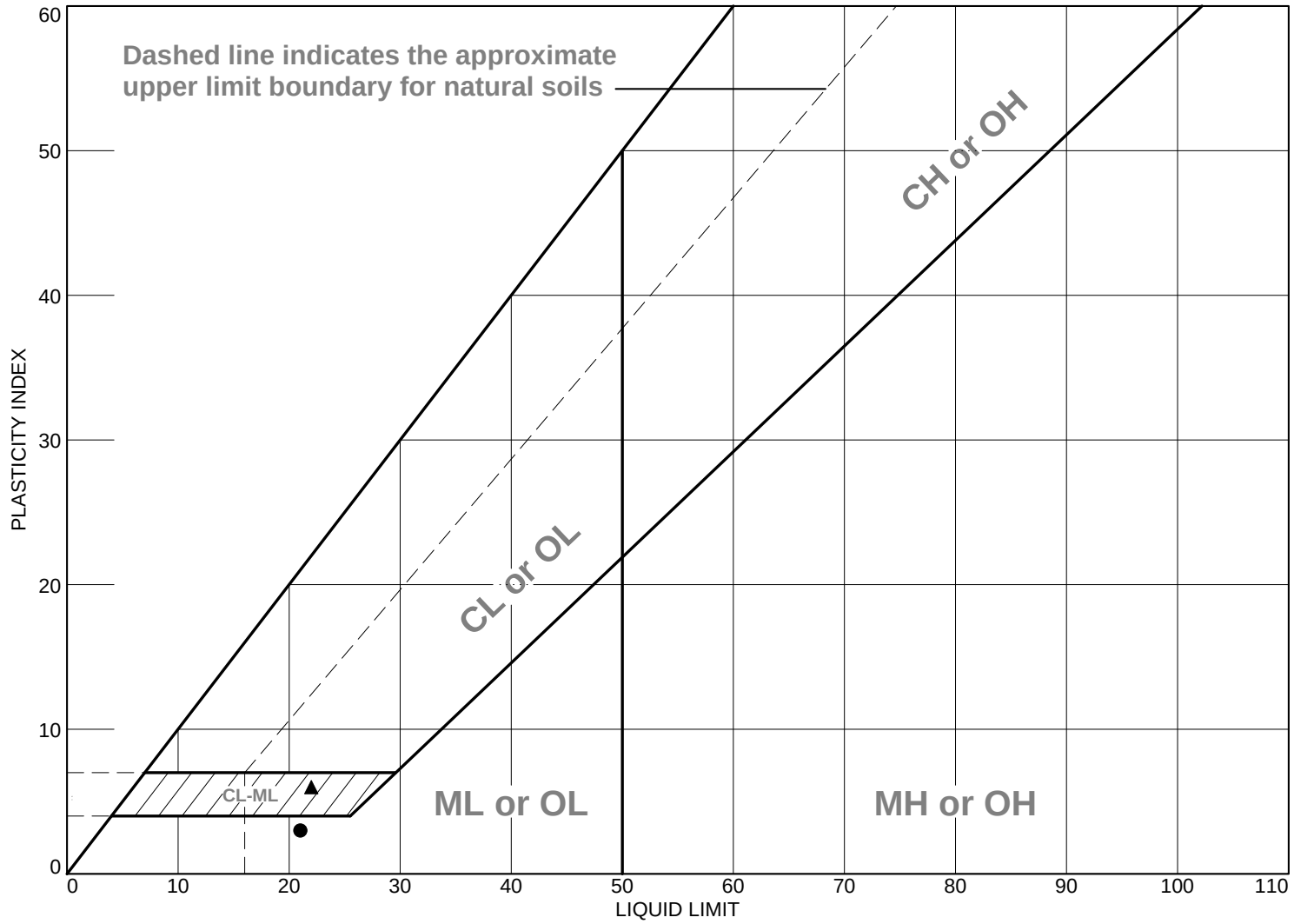
Figure

Tested By: ● rjw ■ rjw ◆ da ▼ da **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange-brown, SILTY SAND	21	18	3	99.2	40.1	SM
■	Orange-brown, SILTY SAND	NP	NP	NP	99.2	13.1	SM
▲	Tan, CLAYEY/SILTY SAND	22	16	6	98.0	38.0	SC-SM
◆	Light Tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.7	11.3	SP-SM
▼	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.4	7.1	SP-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-20 **Depth:** 8.00-10.00 **Sample Number:** S-5
■ **Source of Sample:** BH-20 **Depth:** 28.00-30.00 **Sample Number:** S-9
▲ **Source of Sample:** BH-22 **Depth:** 8.00-10.00 **Sample Number:** S-5
◆ **Source of Sample:** BH-22 **Depth:** 23.00-25.00 **Sample Number:** S-8
▼ **Source of Sample:** BH-22 **Depth:** 33.00-35.00 **Sample Number:** S-10

Remarks:

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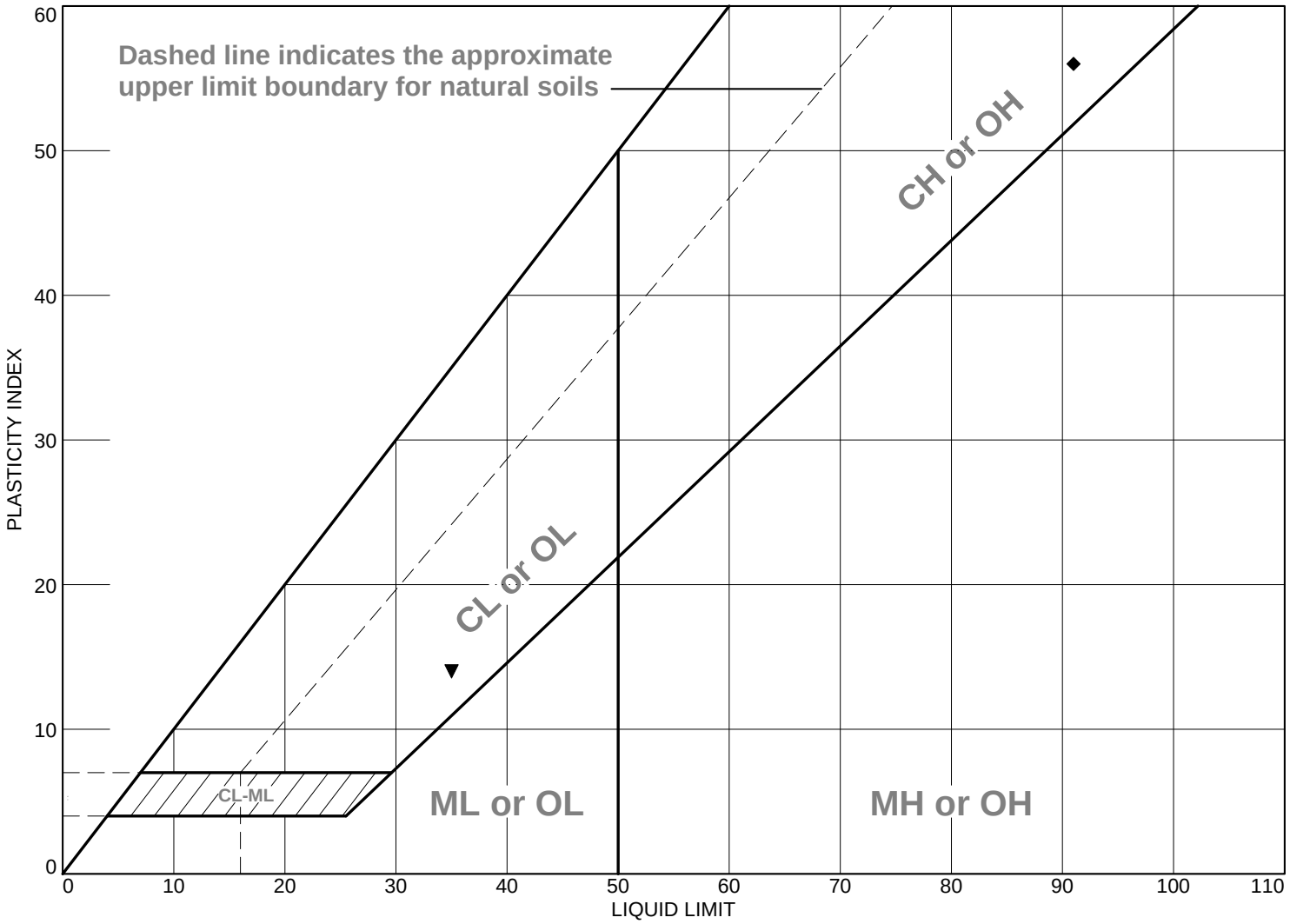
Tested By: ● da ■ hmr ▲ da ◆ hmr ▼ hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, SILTY SAND	NP	NP	NP	98.7	25.0	SM
■	Gray, SILTY SAND	NP	NP	NP	98.7	16.9	SM
▲	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	66.6	7.1	SP-SM
◆	Gray, FAT CLAY	91	35	56	97.0	85.1	CH
▼	Gray, SANDY LEAN CLAY	35	21	14	99.9	57.7	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-24 **Depth:** 23.00-25.00 **Sample Number:** S-8
■ **Source of Sample:** BH-24 **Depth:** 43.0-45.0 **Sample Number:** S-12
▲ **Source of Sample:** BH-24 **Depth:** 48.0-50.0 **Sample Number:** S-13
◆ **Source of Sample:** BH-26 **Depth:** 13.00-15.00 **Sample Number:** S-6
▼ **Source of Sample:** BH-26 **Depth:** 28.00-30.00 **Sample Number:** S-9

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Remarks:

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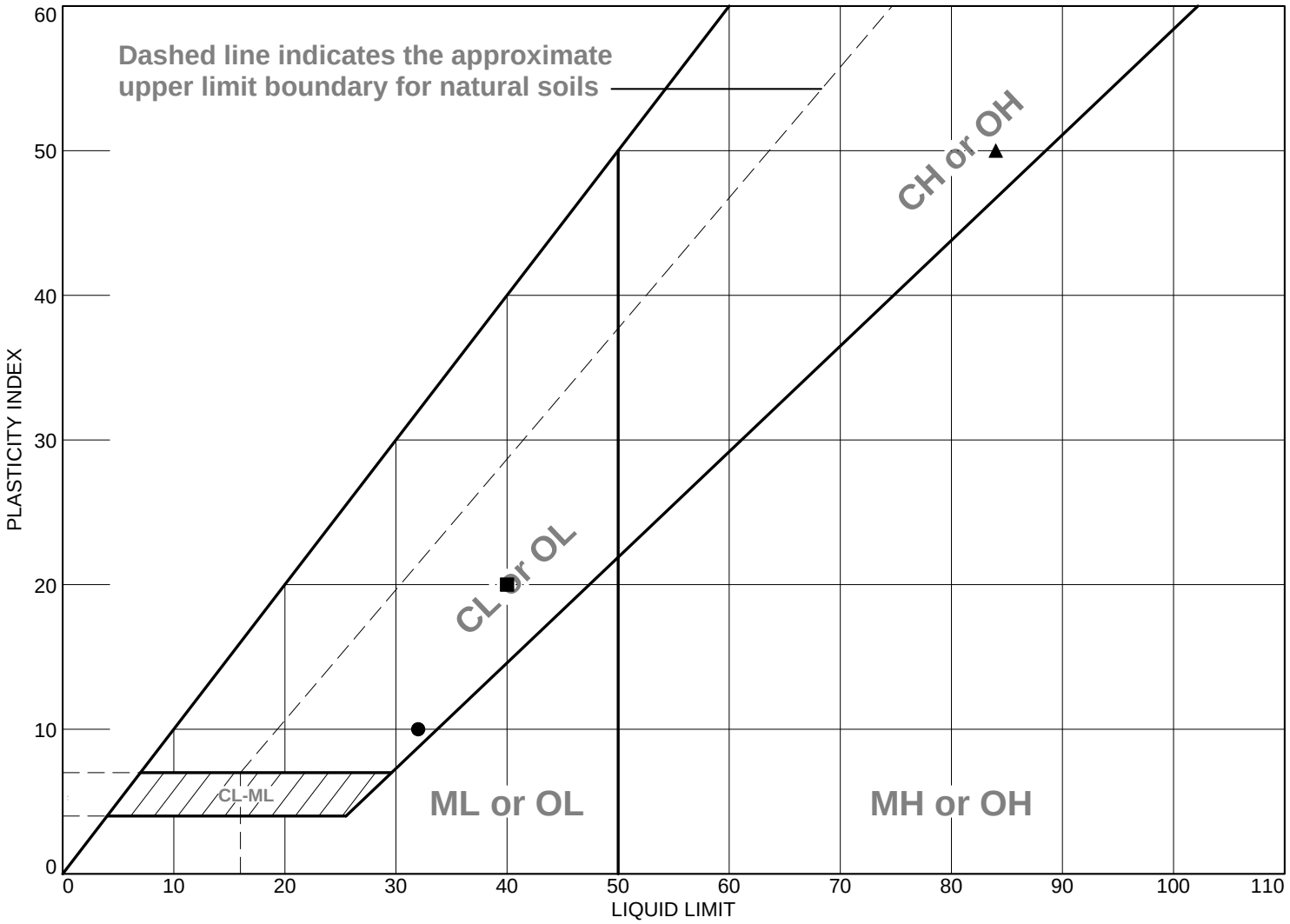
Tested By: ● hmr ■ hmr ▲ hmr ◆ da ▼ da **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, CLAYEY SAND	32	22	10	100.0	21.6	SC
■	Gray, CLAYEY SAND	40	20	20	99.6	45.7	SC
▲	Gray, FAT CLAY	84	34	50	99.3	88.5	CH
◆	Gray, SILTY SAND	NP	NP	NP	99.1	13.5	SM
▼	Gray, SILTY SAND	NP	NP	NP	99.8	45.3	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-26 **Depth:** 58.00-60.00 **Sample Number:** S-15
■ **Source of Sample:** BH-26 **Depth:** 78.00-80.00 **Sample Number:** S-19
▲ **Source of Sample:** BH-26 **Depth:** 93.00-95.00 **Sample Number:** S-22
◆ **Source of Sample:** BH-27 **Depth:** 18.0-20.0 **Sample Number:** S-7
▼ **Source of Sample:** BH-27 **Depth:** 28.00-30.00 **Sample Number:** S-9

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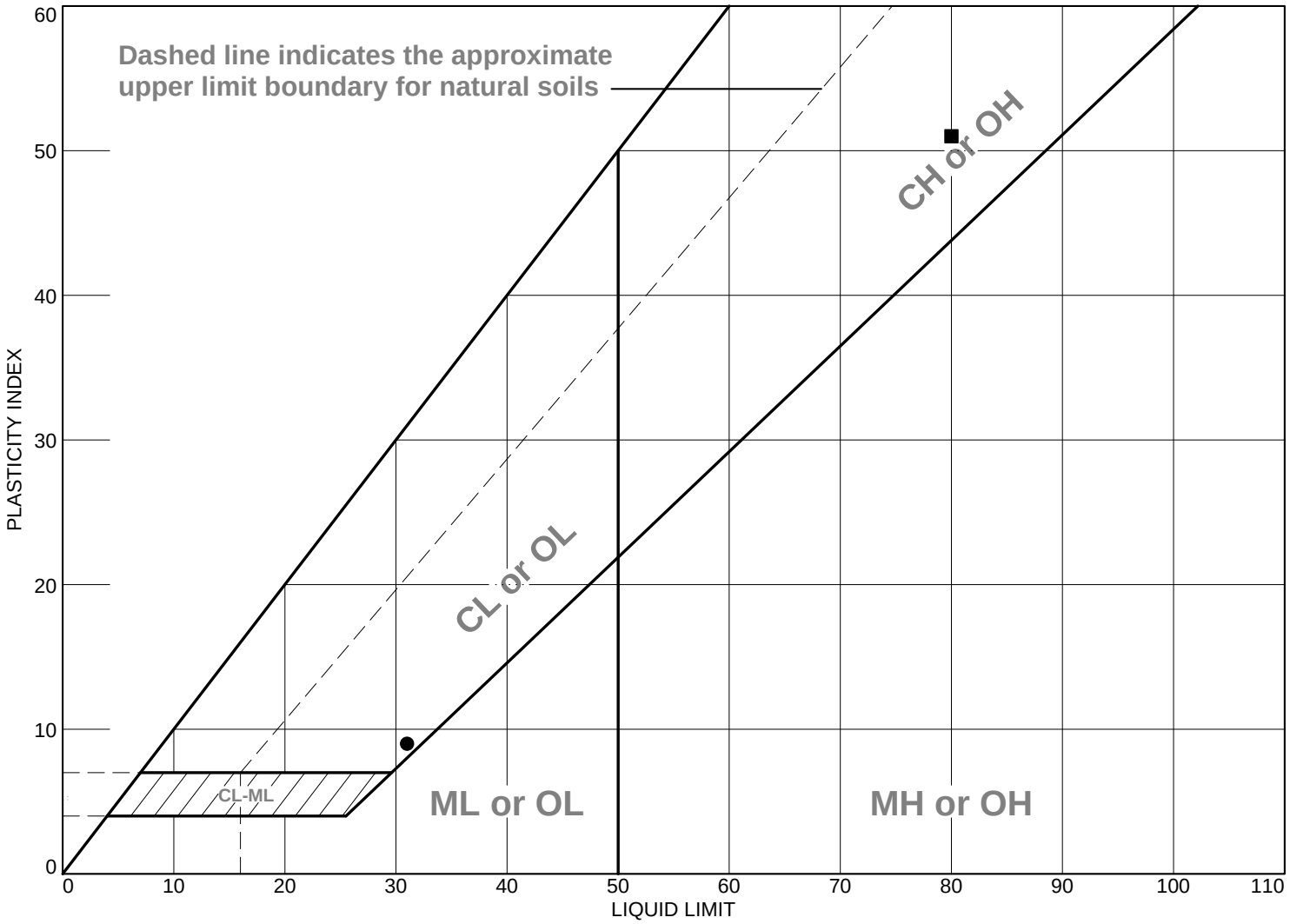
Remarks:

Figure

Tested By: ● da ■ da ▲ da ◆ rjw ▼ hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, SANDY LEAN CLAY	31	22	9	99.9	69.1	CL
■	Gray, FAT CLAY WITH SAND	80	29	51	94.9	82.7	CH
▲	Brown, SILTY SAND	NP	NP	NP	96.9	22.0	SM
◆	Orange-brown, SILTY SAND	NP	NP	NP	96.1	17.8	SM
▼	Orange-tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	97.4	8.1	SP-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-27 **Depth:** 48.0-50.0 **Sample Number:** S-13
■ **Source of Sample:** BH-27 **Depth:** 98.00-100.00 **Sample Number:** S-23
▲ **Source of Sample:** BH-28 **Depth:** 0.00-2.00 **Sample Number:** S-1
◆ **Source of Sample:** BH-28 **Depth:** 8.00-10.0 **Sample Number:** S-5
▼ **Source of Sample:** BH-28 **Depth:** 13.0-15.0 **Sample Number:** S-6

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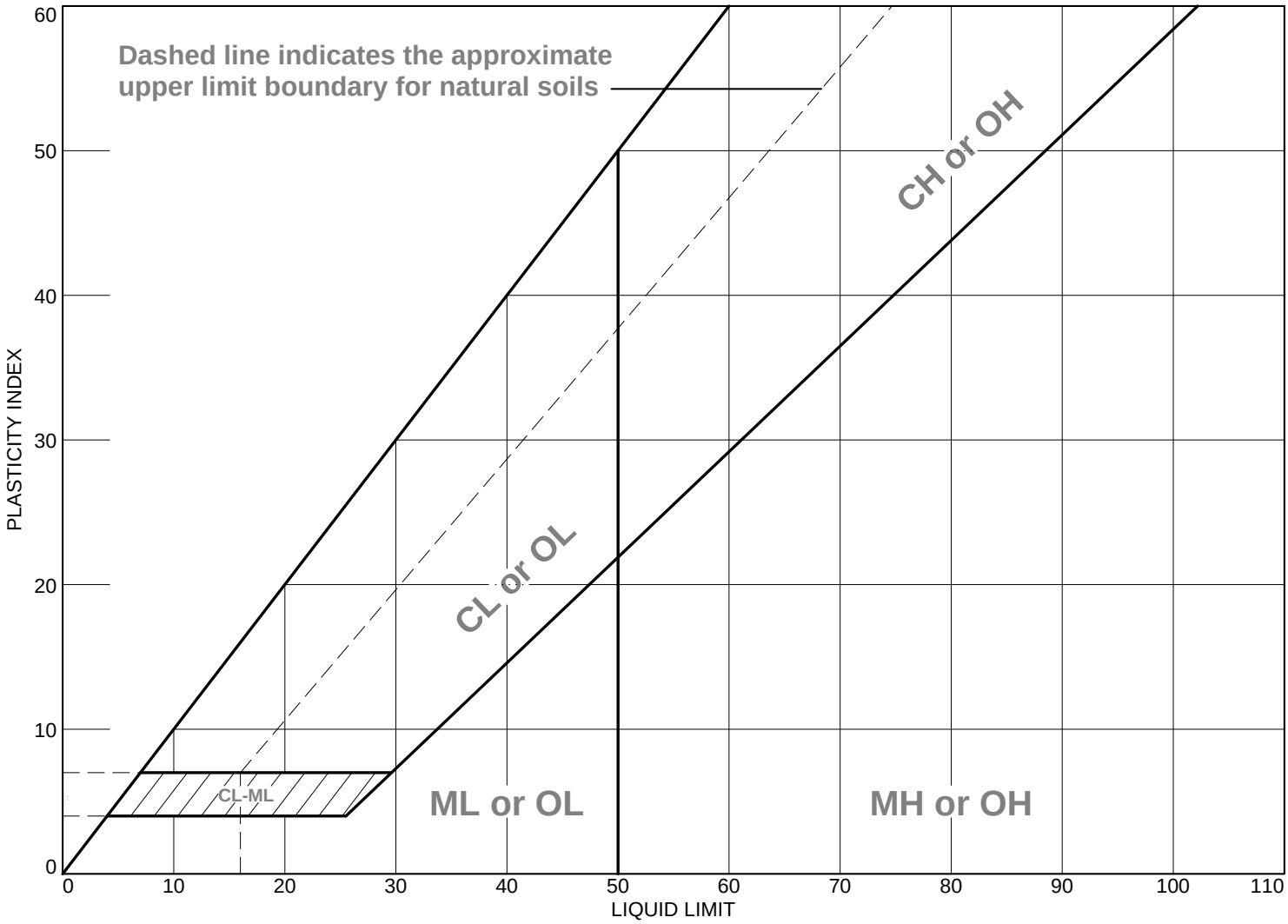
Remarks:

Figure

Tested By: ● pf ▲ rjw ◆ rjw ▼ rjw **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange-brown, SILTY SAND	NP	NP	NP	93.5	20.0	SM
■	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	77.4	9.7	SP-SM
▲	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.7	7.8	SP-SM
◆	Orange-brown, SILTY SAND	NP	NP	NP	89.7	14.4	SM
▼	Orange-brown, SILTY SAND	NP	NP	NP	90.5	12.2	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-29 **Depth:** 6.00-8.00 **Sample Number:** S-4
■ **Source of Sample:** BH-29 **Depth:** 8.0-10.0 **Sample Number:** S-5
▲ **Source of Sample:** BH-29 **Depth:** 13.0-15.0 **Sample Number:** S-6
◆ **Source of Sample:** BH-30 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-30 **Depth:** 8.00-10.0 **Sample Number:** S-5

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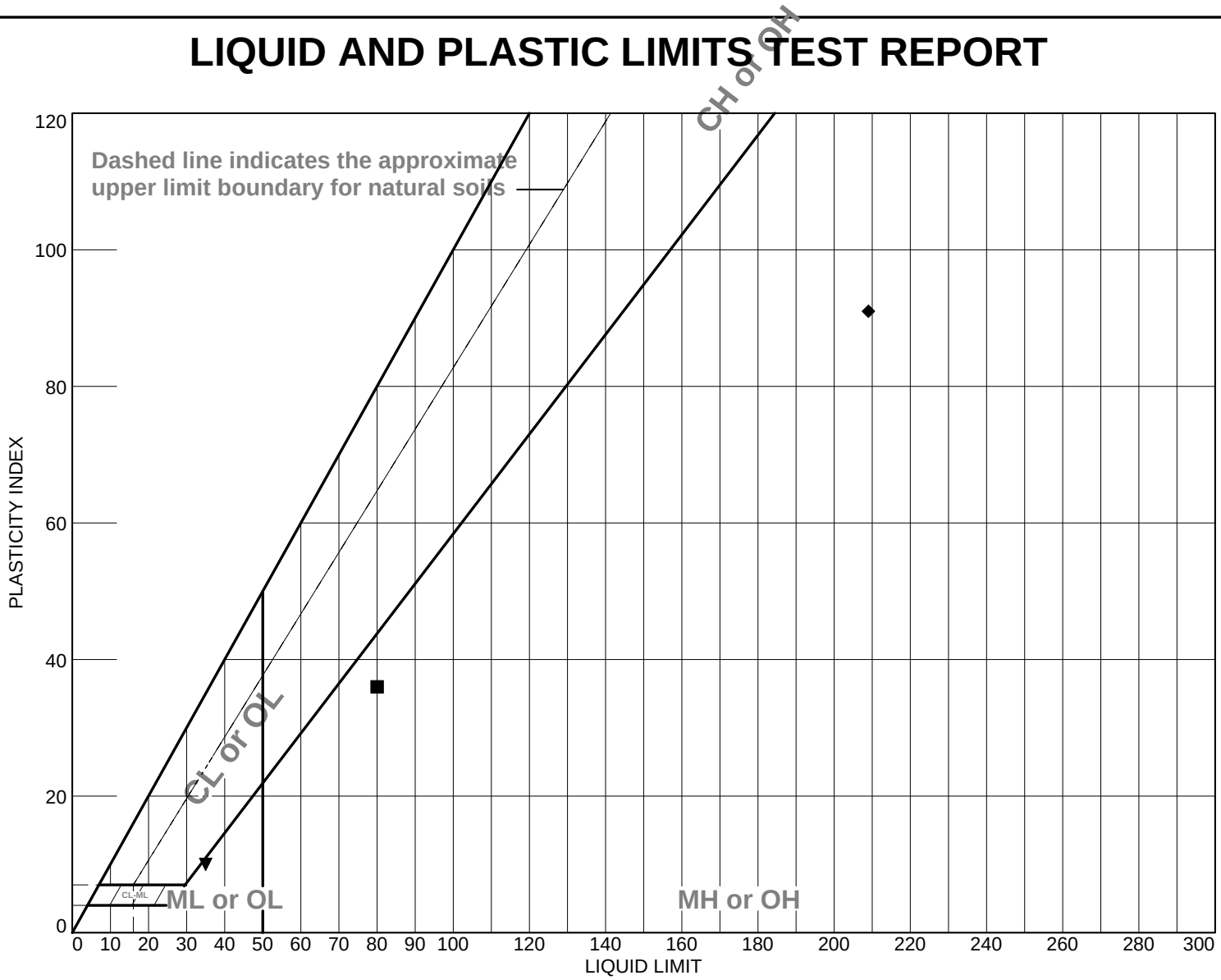
Remarks:

Figure

Tested By: rjw **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.4	8.0	SP-SM
■	(SC) CLAYEY SAND, Orange, Moist, Medium Dense	80	44	36	90.3	48.7	SM
▲	(SC) CLAYEY SAND, Orange, Moist, Medium Dense	NP	NP	NP	94.6	30.4	SM
◆	Gray, ORGANIC CLAY	209	118	91		13.2	OH
▼	Gray, SILTY SAND	35	25	10	99.5	49.2	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-30 **Depth:** 13.0-15.0 **Sample Number:** S-6
■ **Source of Sample:** BH-31 **Depth:** 8.00-10.0 **Sample Number:** S-5
▲ **Source of Sample:** BH-33 **Depth:** 2.00-4.00 **Sample Number:** S-2
◆ **Source of Sample:** BH-34 **Depth:** 8.00-10.00 **Sample Number:** S-5
▼ **Source of Sample:** BH-34 **Depth:** 33.00-35.00 **Sample Number:** S-10

Remarks:
◆ Sample contained significant wood which affected #200 wash values

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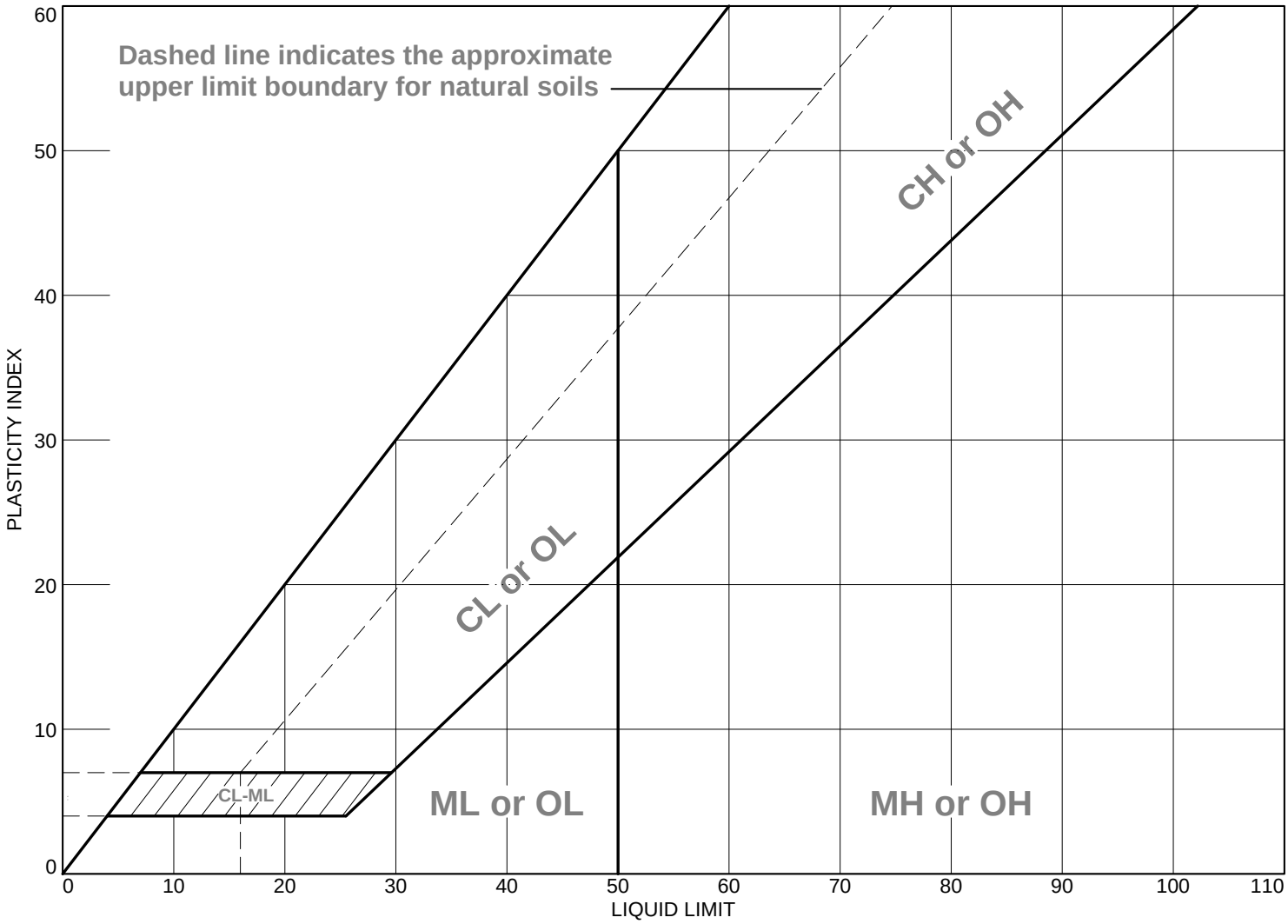
Tested By: ○ rjw □ hmr △ hmr ◇ da ▽ da **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.0	9.1	SP-SM
■	Tan mottled orange, SILTY SAND	22	NP	NP	98.8	24.3	SM
▲	Tan mottled orange, SILTY SAND	NP	NP	NP	99.7	18.5	SM
◆	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.6	10.1	SP-SM
▼	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.7	10.9	SP-SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-36 **Depth:** 8.0-10.0 **Sample Number:** S-5
■ **Source of Sample:** BH-36 **Depth:** 18.0-20.0 **Sample Number:** S-7
▲ **Source of Sample:** BH-36 **Depth:** 23.0-25.0 **Sample Number:** S-8
◆ **Source of Sample:** BH-38 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-38 **Depth:** 13.0-15.0 **Sample Number:** S-6

Remarks:

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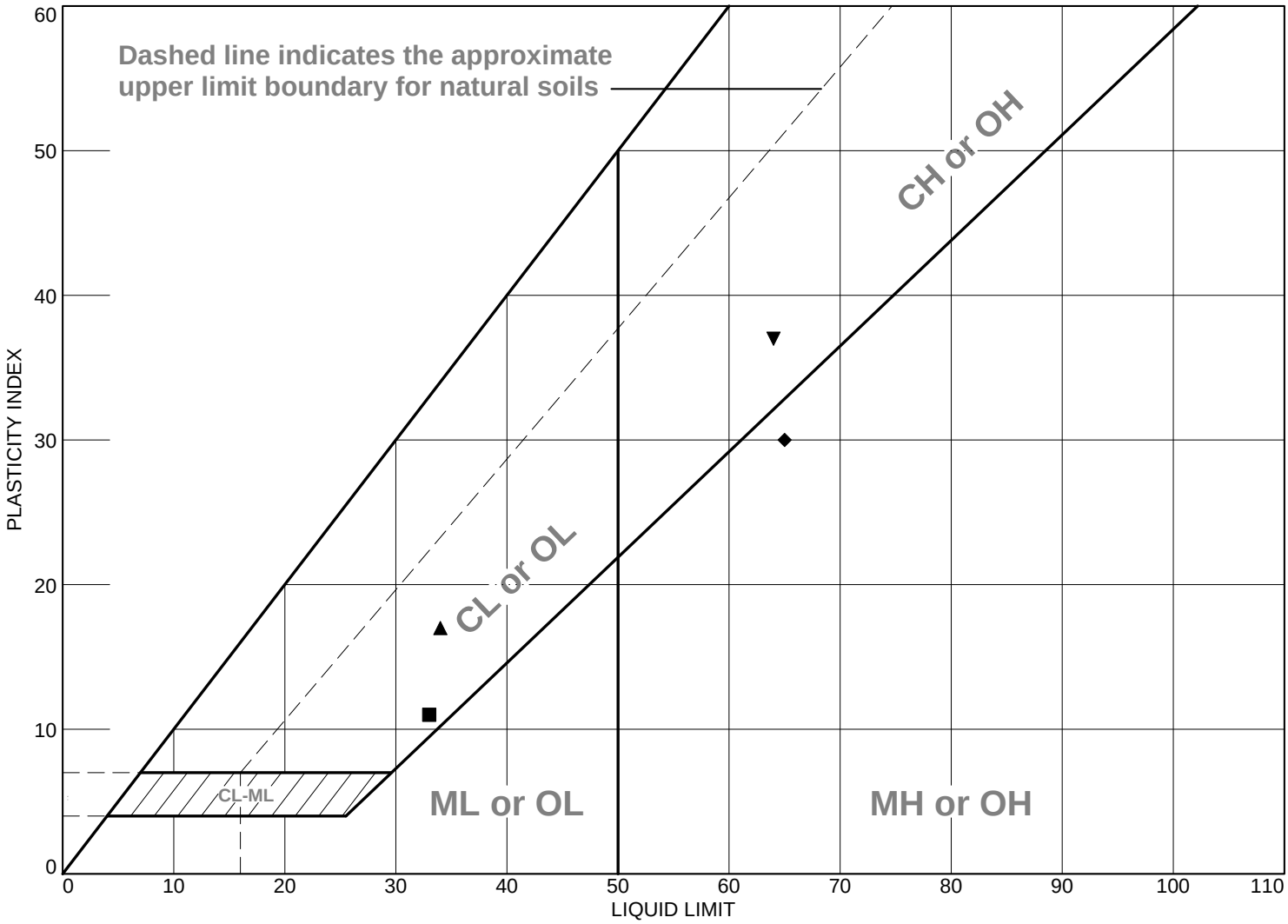
Figure

Tested By: ● hmr ■ DA ▲ hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Light tan, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.8	6.7	SP-SM
■	Brown, CLAYEY SAND	33	22	11	88.8	37.8	SC
▲	Gray, SANDY LEAN CLAY	34	17	17	99.5	69.8	CL
◆	Black, SANDY ELASTIC SILT	65	35	30	88.2	66.3	MH
▼	Gray, SANDY FAT CLAY	64	27	37	94.5	69.1	CH

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-38 **Depth:** 23.0-25.0 **Sample Number:** S-8
■ **Source of Sample:** BH-42 **Depth:** 8.00-10.00 **Sample Number:** S-5
▲ **Source of Sample:** BH-42 **Depth:** 23.00-25.00 **Sample Number:** S-8
◆ **Source of Sample:** BH-43 **Depth:** 8.00-10.00 **Sample Number:** S-5
▼ **Source of Sample:** BH-43 **Depth:** 23.00-25.00 **Sample Number:** S-8

Remarks:

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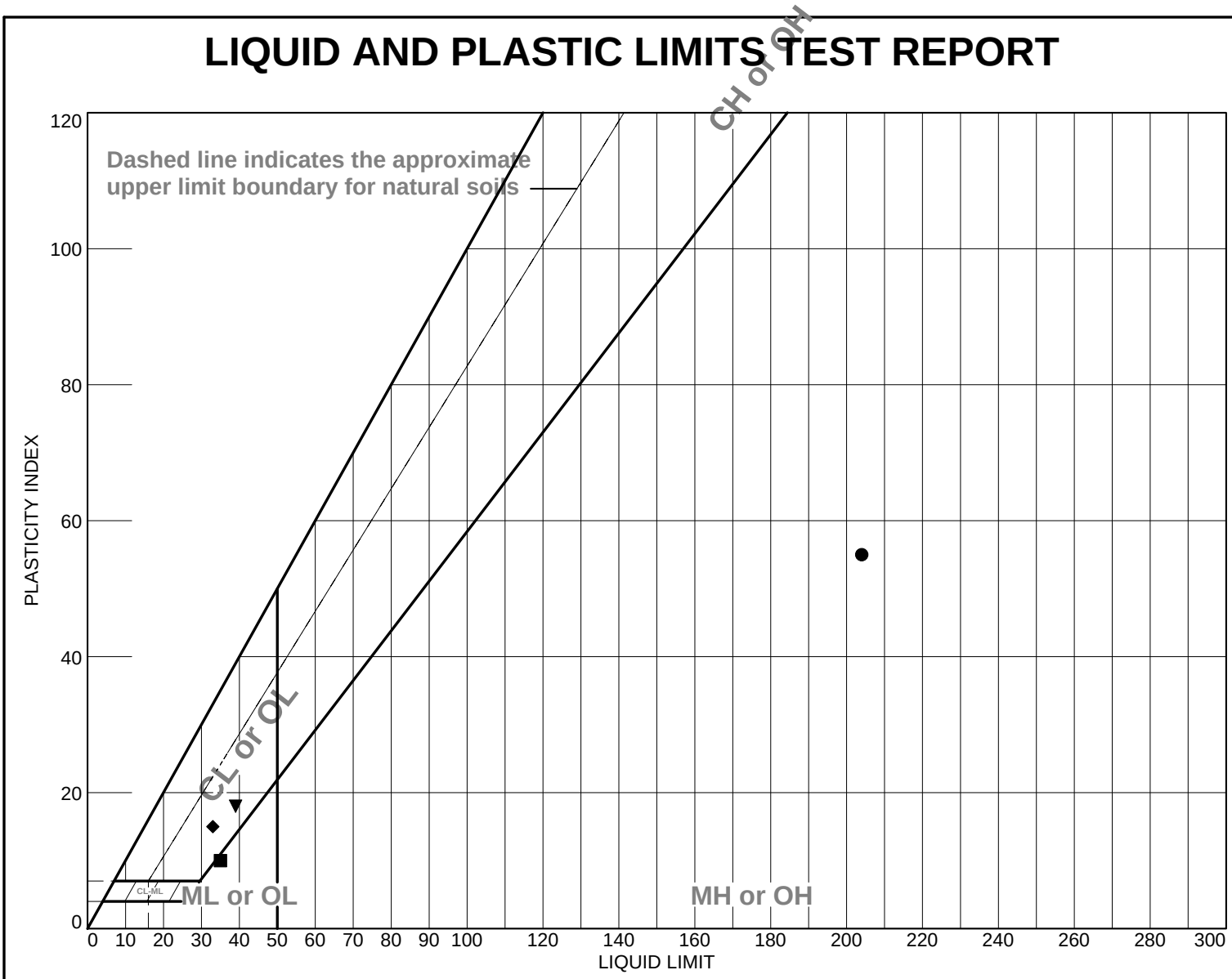
Tested By: da **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, ORGANIC CLAY	204	149	55	52.4	26.5	SM
■	Gray, SILT WITH SAND	35	25	10	99.8	71.3	ML
▲	Gray, SILTY SAND, contains marine shell fragments	NP	NP	NP	84.2	15.8	SM
◆	Gray, SANDY LEAN CLAY	33	18	15	99.7	69.2	CL
▼	Tan mottled orange, LEAN CLAY WITH SAND	39	21	18	99.5	83.3	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-44 **Depth:** 28.00-30.00 **Sample Number:** S-9
■ **Source of Sample:** BH-44 **Depth:** 33.0-35.0 **Sample Number:** S-10
▲ **Source of Sample:** BH-46 **Depth:** 33.0-35.0 **Sample Number:** S-10
◆ **Source of Sample:** BH-46 **Depth:** 38.0-40.0 **Sample Number:** S-11
▼ **Source of Sample:** BH-50 **Depth:** 2.00-4.00 **Sample Number:** S-2

Remarks:
● Sample contained significant wood which altered grain size

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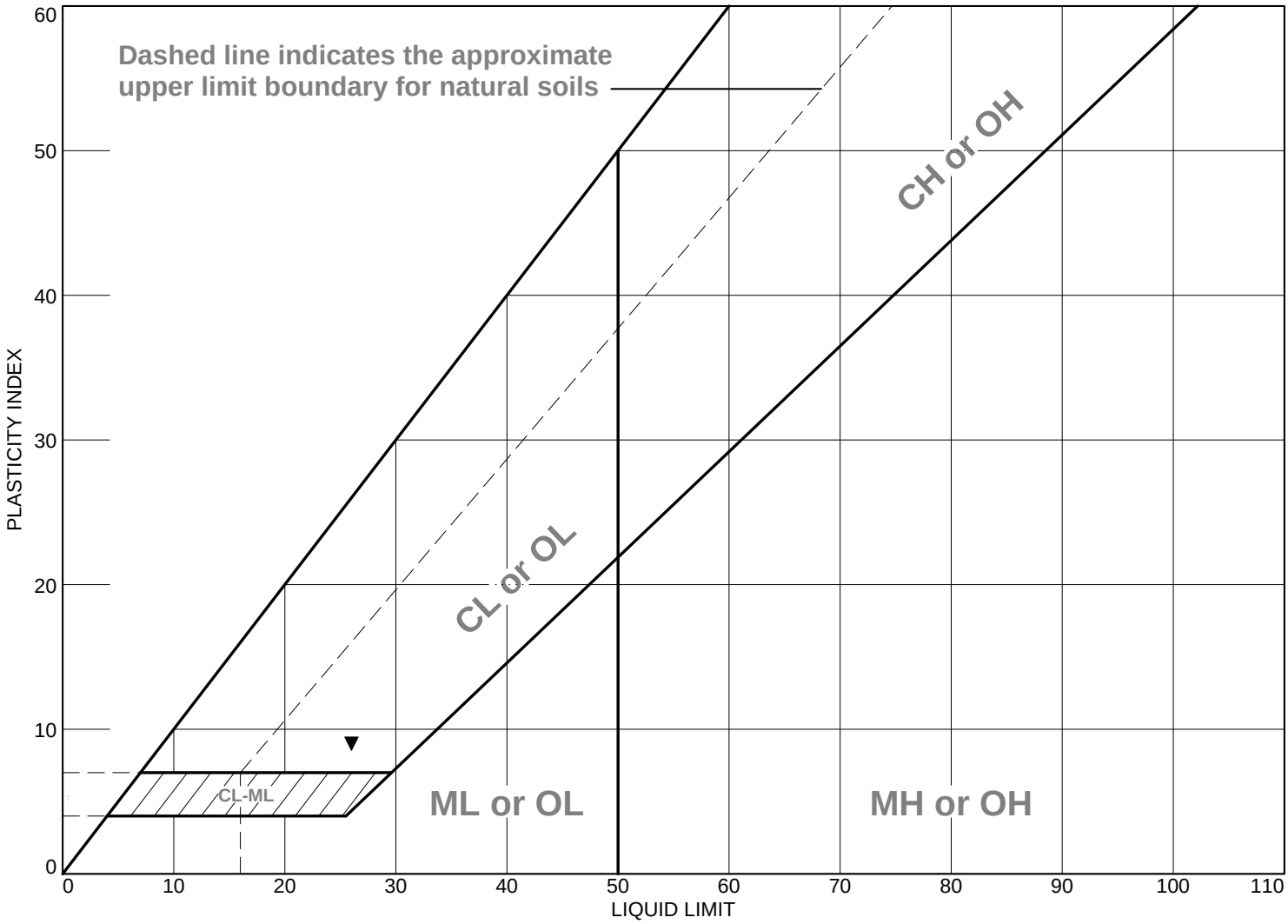
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Orange-tan, SILTY SAND	NP	NP	NP	78.2	14.2	SM
■	Gray, POORLY GRADED SAND WITH SILT, contains marine shell fragments	NP	NP	NP	99.5	8.6	SP-SM
▲	Tan to brown, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.2	11.7	SP-SM
◆	Gray, SILTY SAND, contains marine shell fragments	NP	NP	NP	99.8	26.6	SM
▼	Gray, SANDY LEAN CLAY	26	17	9	99.9	61.4	CL

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-50 **Depth:** 4.00-6.00 **Sample Number:** S-3
■ **Source of Sample:** BH-50 **Depth:** 23.0-25.0 **Sample Number:** S-8
▲ **Source of Sample:** BH-52 **Depth:** 6.00-8.00 **Sample Number:** S-4
◆ **Source of Sample:** BH-52 **Depth:** 23.00-25.00 **Sample Number:** S-8
▼ **Source of Sample:** BH-52 **Depth:** 28.00-30.00 **Sample Number:** S-9

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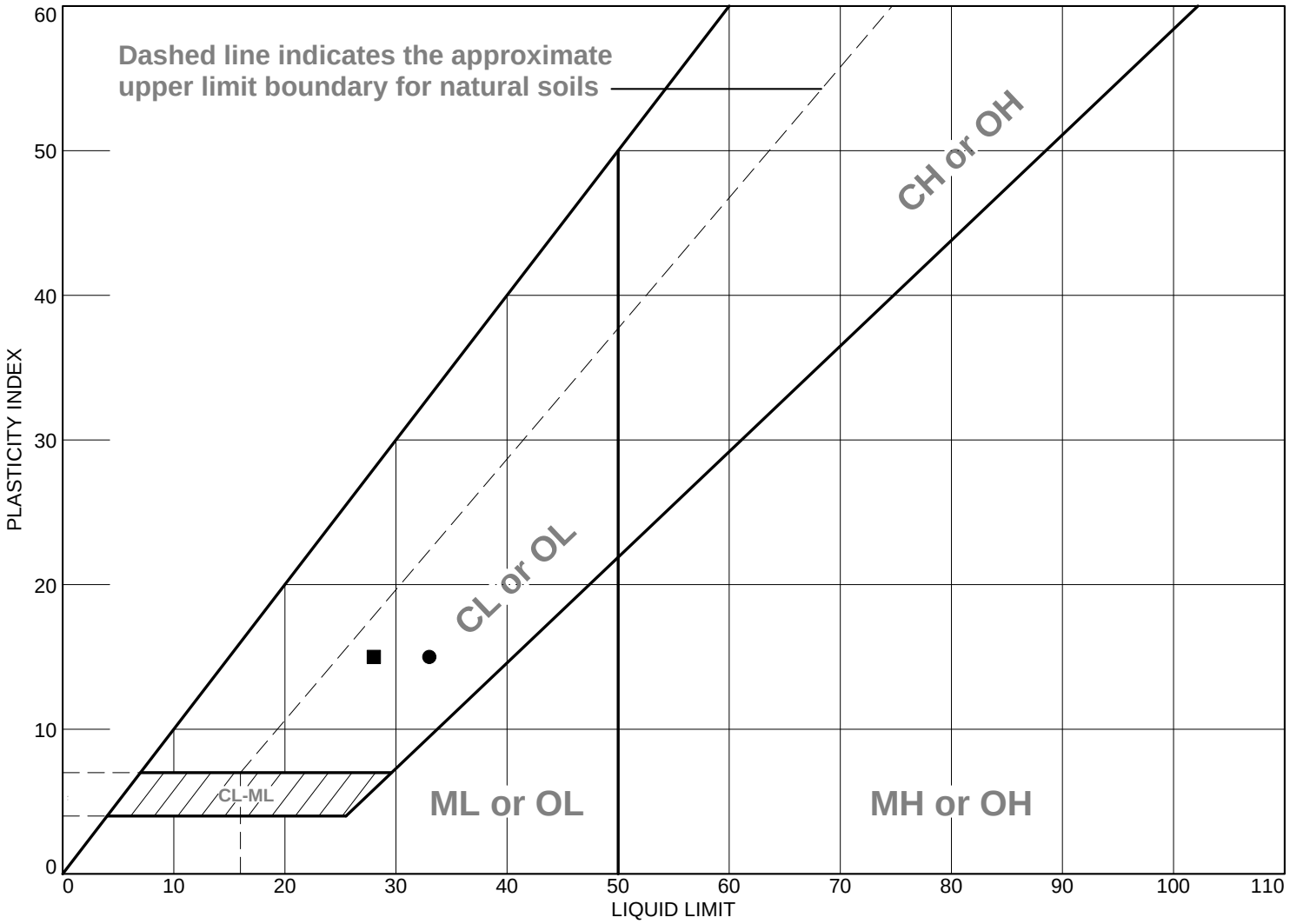
Remarks:

Figure

Tested By: hmr **Checked By:** rjw

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, SANDY LEAN CLAY	33	18	15	88.0	55.1	CL
■	Brown, CLAYEY SAND	28	13	15	80.0	37.4	SC
▲	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	68.4	10.2	SP-SM
◆	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	99.9	8.3	SP-SM
▼	Gray, SILTY SAND	NP	NP	NP	75.2	13.8	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-53 **Depth:** 0.00-2.00 **Sample Number:** S-1
■ **Source of Sample:** BH-53 **Depth:** 2.00-4.00 **Sample Number:** S-2
▲ **Source of Sample:** BH-53 **Depth:** 4.00-6.00 **Sample Number:** S-3
◆ **Source of Sample:** BH-53 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-53 **Depth:** 8.00-10.00 **Sample Number:** S-5

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Remarks:

Figure

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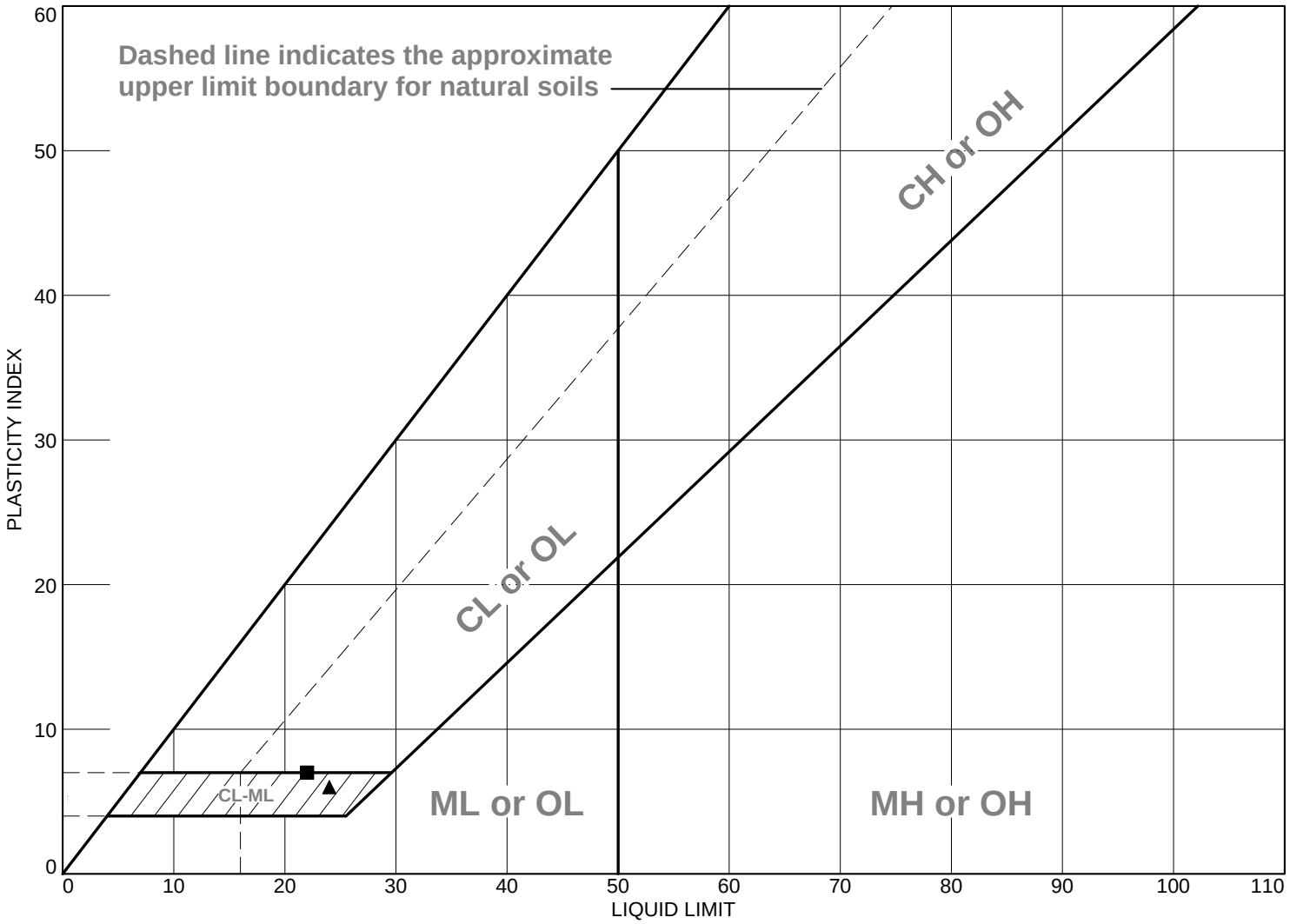
LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Gray, POORLY GRADED SAND WITH SILT, contains marine shell fragments	NP	NP	NP	84.3	5.8	SP-SM
■	Gray, SANDY LEAN CLAY/SILT	22	15	7	90.6	68.3	CL-ML
▲	Gray-brown, POORLY GRADED SAND WITH CLAY	24	18	6	76.1	12.0	SP-SC
◆	Gray, POORLY GRADED SAND WITH SILT	NP	NP	NP	58.2	8.5	SP-SM
▼	Gray, SILTY SAND, contains marine shell fragments	NP	NP	NP	92.1	13.8	SM

Project No. 04:9663-O **Client:** VDOT

Project: VDOT I-64/264 PN:0264-122-108 UPC57048

● **Source of Sample:** BH-53 **Depth:** 13.00-15.00 **Sample Number:** S-6
■ **Source of Sample:** BH-54 **Depth:** 0.00-2.00 **Sample Number:** S-1
▲ **Source of Sample:** BH-54 **Depth:** 4.00-6.00 **Sample Number:** S-3
◆ **Source of Sample:** BH-54 **Depth:** 6.00-8.00 **Sample Number:** S-4
▼ **Source of Sample:** BH-54 **Depth:** 8.00-10.00 **Sample Number:** S-5

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Remarks:

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