PATRICK ENGINEERING INC. — Boring B-3-96, Sheet 1 of 2

BORING NUMBER B-3-96 SHEET 1 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,061.2 E 696,997.8
LOGGED BY PJC
GROUND ELEVATION 9.6

Elevation	Depth (ft)	Soil/Rock Description
9.6	0.0	IDOT CA-7 at surface. Black silty clay, little coarse to fine sand, trace coarse to fine gravel, trace brick fragments, medium stiff, medium plasticity, moist CL -FILL-
8.1	1.5	
6.9	2.7	Brown coarse to fine sand, little silt, trace clay, medium dense, moist SM -FILL-
4.9	4.7	Brown and gray silty clay, little to some coarse to fine sand, soft, medium plasticity, wet CL -FILL-
		Black and brown coarse to fine sand, little silt and clay, medium dense to loose, moist SM -FILL- Brown at 7.0'
0.4 / 0.3	9.2 / 9.3	Gray clayey silt to silt, little coarse to fine sand, very loose, saturated CL-ML/ML -FILL- Some coarse to fine sand at 11.0'
-3.9	13.5	Gray silty clay, trace to little coarse to fine sand, very soft, medium plasticity, wet CL -FILL-

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content (PL/LL 10–50)
AU-1	0.0-1.0			11.1
SS-2A/B	1.0-3.0	16"R	9, 14, 10, 11	15.7
SS-3	3.0-5.0	17"R	3, 4, 5, 6	24.0
SS-4	5.0-7.0	0"R	4, 7, 4, 6	15.6
SS-5	7.0-9.0	20"R	2, 3, 3, 3	23.1
SS-6A/B	9.0-11.0	24"R	1, WOH, WOH, 1	26.1
SS-7	11.0-13.0	17"R	WOH, WOH, 1, 1	32.7
SS-8A/B	13.0-15.0	18"R	1, 1, WOH, 1	20.4, 20.0
SS-9	15.0-17.0	18"R	1, 1, 1, 1	21.5
SS-10	17.0-19.0	17"R	2, 3, 4, 3	23.3

Notes & Test Results: PID=Photo-ionization device results in parts per million (ppm). AU-1: PID=210ppm SS-2: PID=360ppm SS-3: PID=50ppm SS-4: No recovery Drove 3" spoon N=22 12"R SS-4: PID=30ppm SS-5: PID=24ppm SS-6A: PID=33ppm SS-6B: PID=60ppm SS-7: PID=13ppm SS-8A: PID=9.0ppm SS-8B: qu<.25*tsf PID=6.7ppm qu<.25*tsf SS-9: PID=7.2ppm SS-10: PID=6.6ppm qu=0.2**tsf

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/20/96 ENDED 12/20/96
REMARKS Piezometer P-3-96 installed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 10.0' during drilling; ▼ 9.3 1/14/97; ▼ 9.1' 4/15/97

PATRICK ENGINEERING INC. — Boring B-3-96, Sheet 2 of 2

BORING NUMBER B-3-96 SHEET 2 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,061.2 E 696,997.8
LOGGED BY PJC
GROUND ELEVATION 9.6

Elevation	Depth (ft)	Soil/Rock Description
-9.4	19.0	Gray silty clay, trace to little coarse to fine sand, very soft, medium plasticity, wet CL -FILL-
-14.8	24.4	Gray coarse to fine sand, little silt, loose to medium dense, saturated SM -FILL- Little medium to fine gravel at 25.0' Brown and gray at 27.0' Fragments of wood in samples SS-15 and SS-16
-23.4	33.0	Gray silty clay, trace coarse to fine sand, very stiff, low plasticity, moist CL
-25.4	35.0	End of Boring at 35.0'.

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
SS-11	19.0-21.0	20"R	1, 1, 2, 3	21.0
SS-12	21.0-23.0	14"R	2, 2, 3, 3	23.0
SS-13A/B	23.0-25.0	17"R	1, 1, 1, 2	21.6, 28.0
SS-14	25.0-27.0	17"R	WOH, 2, 3, 3	28.3
SS-15	27.0-29.0	24"R	10, 15, 14, 12	25.6
SS-16	29.0-31.0	21"R	17, 14, 15, 20	26.7
SS-17	31.0-33.0	24"R	16, 17, 15, 13	14.0
SS-18	33.0-35.0	24"R	10, 12, 16, 11	14.6

Notes & Test Results: SS-11: PID=5.9ppm SS-12: PID=6.8ppm qu=0.2**tsf SS-13A: PID=4.2ppm qu=0.2**tsf SS-13B: PID=4.7ppm SS-14: PID=9.4ppm SS-15: PID=7.4ppm Gravel = 1% Sand = 83% Fines = 16% SS-16: PID=4.2ppm SS-17: PID=5.0ppm SS-18: PID=5.2ppm

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/20/96 ENDED 12/20/96
REMARKS Piezometer P-3-96 installed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 10.0' during drilling; ▼ 9.3 1/14/97; ▼ 9.1' 4/15/97

PATRICK ENGINEERING INC. — Boring B-4-96, Sheet 1 of 2

BORING NUMBER B-4-96 SHEET 1 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,151.6 E 696,693.0
LOGGED BY MDB
GROUND ELEVATION 10.0

Elevation	Depth (ft)	Soil/Rock Description
10.0	0.0	Brown silty clay, some coarse to fine sand, trace coarse to fine gravel, low plasticity, moist CL -FILL-
8.0	2.0	Light brown and gray coarse to fine sand, trace silt, trace bricks, trace concrete, medium dense, moist SP-SM -FILL-
6.0	4.0	Black silty clay and sand, trace coarse to fine gravel, stiff, low plasticity, wet CL -FILL-
3.2	6.8	Gray silty clay, trace coarse to fine sand, trace coarse to fine gravel, very soft, medium plasticity, wet CL -FILL-
-0.1	10.1	▽
-5.7	15.7	Gray silty fine sand, loose to medium dense, saturated SM -FILL-
-8.7	18.7	
-9.0	19.0	Gray silty clay, trace to little coarse to fine sand, stiff, low plasticity, wet

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
AU-1	0.0-1.0			15.9
SS-2A/B	1.0-3.0	18"R	10, 10, 15, 14	15.4, 14.1
SS-3	3.0-5.0	10"R	9, 8, 11, 8	18.9
SS-4	5.0-7.0	19"R	4, 5, 4, 16	24.7
SS-5	7.0-9.0	22"R	4, 3, 3, 3	21.7
SS-6	9.0-11.0	14"R	4, 1, 2, 4	26.0
SS-7	11.0-13.0	14"R	2, 2, 2, 2	24.5
SS-8	13.0-15.0	24"R	3, 3, 4, 3	20.3
SS-9A/B	15.0-17.0	17"R	3, 7, 6, 8	24.5, 22.6
SS-10A/B	17.0-19.0	24"R	2, 3, 4, 5	27.7, 24.4
SS-11	19.0-21.0		7, 8	27.0

Notes & Test Results: PID=Photo-ionization device results in parts per million (ppm). AU-1: PID=0ppm SS-2B: PID=0ppm SS-3: PID=0ppm SS-4: PID=0ppm Augers grinding qu<.25*tsf qu<.25*tsf

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/17/96 ENDED 12/17/96
REMARKS Piezometer P-4D-96 installed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 15.7' during drilling; ▼ 10.2' 1/14/97; ▼ 10.1 4/15/97

PATRICK ENGINEERING INC. — Boring B-4-96, Sheet 2 of 2

BORING NUMBER B-4-96 SHEET 2 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,151.6 E 696,693.0
LOGGED BY MDB
GROUND ELEVATION 10.0

Elevation	Depth (ft)	Soil/Rock Description
-10.0	20.0	CL -FILL-
		Gray and brown fine sand, trace silt, medium dense, saturated SP-SM -FILL-
-12.0	22.0	
-13.0	23.0	Gray silty clay, little coarse to fine sand, very stiff, low plasticity, wet CL -FILL-
-14.0	24.0	
-15.4	25.4	Gray silty fine sand, loose, saturated SM -FILL-
-16.5	26.5	
-17.5	27.5	Gray silty clay, trace coarse to fine sand, trace coarse to fine gravel, stiff, low plasticity, moist CL -FILL-
-20.0	30.0	Gray silty coarse to fine sand and fine gravel, loose, saturated SM -FILL-
		Black wood -FILL-
		Gray silty medium to fine sand, dense, saturated SM -FILL-
		End of Boring at 30.0'.

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
		24"R	10, 10	
SS-12A/B	21.0-23.0	24"R	5, 7, 7, 9	33.2, 26.2
SS-13A/B	23.0-23.5		1, 50/0	21.0
SS-14	24.0-26.0	8"R	6, 3, 3, 4	12.7
SS-15A/B	26.0-27.0	12"R	11, 80	
SS-16	28.0-30.0	24"R	9, 16, 15, 14	

Notes & Test Results: Gravel = 1% Sand = 90% Fines = 9% SS-13: 6" recovery Unknown obstruction at 23.5'. Auger refusal at 24.1'. Installed piezometer P-4D-96. Offset 20' south, drilled blind to 24', resumed sampling. Offset from P-4D-96 6.0' east, drilled blind to a depth of 11.4' and installed piezometer P-4S-96. See installation reports for more details.

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/17/96 ENDED 12/17/96
REMARKS Piezometer P-4D-96 installed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 15.7' during drilling; ▼ 10.2' 1/14/97; ▼ 10.1 4/15/97

PATRICK ENGINEERING INC. — Boring B-5-96, Sheet 1 of 2

BORING NUMBER B-5-96 SHEET 1 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,133.6 E 696,850.5
LOGGED BY PJC
GROUND ELEVATION 9.5

Elevation	Depth (ft)	Soil/Rock Description
9.5	0.0	Brown and gray silty clay, little coarse to fine sand, little coarse to fine gravel, stiff, medium plasticity, wet CL -FILL-
6.4	3.1	Gray silty clay, trace coarse to fine sand, trace fine gravel, medium stiff to stiff, medium plasticity, wet CL -FILL-
0.9	8.6	▽
-0.7	10.2	Gray clayey silt, little coarse to fine sand, very loose, saturated CL-ML -FILL-
-1.4	10.9	Gray medium to fine sand, some silt, very loose, saturated SM -FILL-
-4.5	14.0	Gray silty clay, little coarse to fine sand, soft to stiff, medium plasticity, moist to wet CL -FILL-
-9.5	19.0	

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
AU-1	0.0-1.0			23.2
SS-2	1.0-3.0	18"R	15, 25, 24, 24	21.5
SS-3	3.0-5.0	20"R	1, 3, 5, 6	19.5
SS-4	5.0-7.0	21"R	3, 4, 3, 3	22.6
SS-5	7.0-9.0	14"R	1, 1, 1, 3	20.2
SS-6A/B	9.0-11.0	20"R	1, 2, 2, 2	22.8, 22.0
SS-7	11.0-13.0	18"R	WOH, 1, 1, 1	28.8
SS-8A/B	13.0-15.0	21"R	WOH, 1, 3, 2	31.6, 24.5
SS-9	15.0-17.0	16"R	2, 2, 2, 2	21.4
SS-10	17.0-19.0	16"R	2, 5, 6, 6	18.5

Notes & Test Results: PID=Photo-ionization device results in parts per million (ppm). AU-1: PID=1.9ppm SS-2: PID=1.5ppm Auger grinding SS-3: PID=1.6ppm qu=1.5**tsf SS-5: PID=1.6ppm qu=0.4**tsf PID=1.9ppm SS-6A: PID=1.8ppm SS-6B: PID=1.5ppm SS-7: PID=2.1ppm SS-8A: PID=1.9ppm SS-8B: PID=1.8ppm SS-9: PID=1.9ppm SS-10: PID=2.1ppm qu=2.5**tsf

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/18/96 ENDED 12/18/96
REMARKS Piezometer P-5D-96 constructed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 10.2' during drilling; ▼ 9.0' 1/14/97; ▼ 8.6 4/15/97

PATRICK ENGINEERING INC. — Boring B-5-96, Sheet 2 of 2

BORING NUMBER B-5-96 SHEET 2 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,133.6 E 696,850.5
LOGGED BY PJC
GROUND ELEVATION 9.5

Elevation	Depth (ft)	Soil/Rock Description
-9.5	19.0	Gray silty clay, little coarse to fine sand, soft to stiff, medium plasticity, moist to wet CL -FILL-
-12.3	21.8	Gray silty clay to clayey silt, little coarse to fine sand, little coarse to fine gravel, medium stiff to stiff, wet CL-ML -FILL-
-16.5	26.0	Gray and brown coarse to fine sand, trace fine gravel, trace to little silt, very loose to medium dense, saturated SP-SM -FILL-
-21.7	31.2	Gray silty clay, trace coarse to fine sand, medium stiff, low plasticity, wet CL
-23.3	32.8	End of Boring at 32.8'.

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
SS-11	19.0-21.0	19"R	2, 6, 7, 8	18.9
SS-12	21.0-23.0	0"R	6, 2, 3, 3	
SS-13	23.0-25.0	24"R	3, 6, 3, 7	34.2
SS-14	25.0-27.0	0"R	4, 5, 4, 9	22.0
SS-15	27.0-29.0	24"R	WOH	30.4
SS-16	29.0-31.0	24"R	WOH, WOH, 16, 8	28.3
SS-17	31.0-32.8	20"R	WOH, 3, 4, 5	21.0

Notes & Test Results: SS-11: PID=2.3ppm qu=2.6**tsf Push 2" spoon. No recovery. Push 3" spoon for sample. No recovery. SS-13: PID=2.1ppm Auger grinding at 25.0'. Push 2" spoon. No recovery. Push 3" spoon. 6" recovery. PID=1.7ppm Gravel = 5% Sand = 86% Fines = 9% SS-16: PID=1.5ppm PID=1.5ppm qu=0.9**tsf 4' of blow in. Used plug and lifted augers to cleanout. Piezometer P-5D-96 installed in borehole. Piezometer P-5S-96 installed in offset borehole approximately 4.0' east.

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 TM
DRILLING STARTED 12/18/96 ENDED 12/18/96
REMARKS Piezometer P-5D-96 constructed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 10.2' during drilling; ▼ 9.0' 1/14/97; ▼ 8.6 4/15/97

PATRICK ENGINEERING INC. — Boring B-6-96, Sheet 1 of 2

BORING NUMBER B-6-96 SHEET 1 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,147.9 E 697,051.2
LOGGED BY PJC
GROUND ELEVATION 9.8

Elevation	Depth (ft)	Soil/Rock Description
9.8	0.0	6" of IDOT CA-7 at surface. Black and brown silty clay, little coarse to fine sand, trace medium to fine gravel, trace wood, stiff, medium plasticity, wet CL -FILL-
6.2	3.6	Little cinders at 4.0'. Gray silty clay, little coarse to fine sand, stiff, medium plasticity, moist to wet CL -FILL-
3.0	6.8	Gray clayey silt to silt, little to some coarse to fine sand, very loose, moist to saturated CL-ML/ML -FILL-
1.8	8.0	▽
1.1	8.7	Gray clayey silt to silty clay, little coarse to fine sand, medium stiff, medium to low plasticity, moist to wet CL-ML/CL -FILL-
-2.2	12.0	Gray and brown coarse to fine sand, some silt, loose, saturated SM -FILL-
-7.1	16.9	Gray and black silty clay, little coarse to fine sand, medium stiff to hard, low plasticity, moist CL

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
AU-1	0.0-1.0			4.0
SS-2	1.0-3.0	19"R	10, 11, 12, 12	30.6
SS-3A/B	3.0-5.0	14"R	9, 13, 4, 3	25.9, 20.6
SS-4	5.0-7.0	18"R	2, 3, 2, 2	18.7
SS-5	7.0-9.0	17"R	1, 2, 1, 2	27.2
SS-6	9.0-11.0	14"R	1, 1, 1, 2	12.0
SS-7A/B	11.0-13.0	16"R	WOH, 2, 3, 4	27.5, 19.7
SS-8	13.0-15.0	19"R	2, 3, 4, 4	33.0
SS-9	15.0-17.0	21"R	2, 2, 2, 3	24.8
SS-10	17.0-19.0	17"R	3, 3, 5, 7	13.5

Notes & Test Results: PID=Photo-ionization device results in parts per million (ppm). AU-1: PID=2.3ppm SS-2: PID=2.4ppm SS-3A: PID=15.5ppm SS-3B: PID=9.0ppm SS-4: PID=3.5ppm SS-5: PID=3.5ppm SS-6: PID=3.1ppm SS-7A: PID=3.3ppm qu=0.3**tsf SS-7B: PID=3.0ppm SS-8: PID=3.5ppm Gravel = 1% Sand = 76% Fines = 23% SS-9: PID=3.2ppm PID=2.5ppm qu=5.3**tsf

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 ATV
DRILLING STARTED 12/23/96 ENDED 12/23/96
REMARKS Piezometer P-6D-96 constructed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 8.0' during drilling; ▼ 8.5' 1/13/97; ▼ 8.0 4/15/97

PATRICK ENGINEERING INC. — Boring B-6-96, Sheet 2 of 2

BORING NUMBER B-6-96 SHEET 2 OF 2
CLIENT Illinois Department of Natural Resources
PROJECT & NO. Lake Michigan Leakage Control - L6091.A0-2
LOCATION US North Pier, See boring location plan, 94 Streeter Dr., Chicago, IL N 1,903,147.9 E 697,051.2
LOGGED BY PJC
GROUND ELEVATION 9.8

Elevation	Depth (ft)	Soil/Rock Description
-9.2	19.0	-FILL- Gray and black silty clay, little coarse to fine sand, medium stiff to hard, low plasticity, moist CL -FILL-
-11.0	20.8	Gray silty clay to clayey silt, trace to little coarse to fine sand, medium stiff, low plasticity, wet CL/CL-ML -FILL-
-12.9	22.7	Gray and brown coarse to fine sand, some clayey silt, trace fine gravel, loose to medium dense, saturated SM -FILL- Trace silt at 31.0'
-22.2	32.0	Gray silty clay, trace coarse to fine sand, soft, medium plasticity, wet CL
-24.7	34.5	End of Boring at 34.5'.

Sample Type & No.	Depth (ft)	Recovery (in)	Blow Counts	Water Content
SS-11	19.0-21.0	18"R	3, 4, 4, 3	16.0
SS-12	21.0-23.0	17"R	1, 3, 5, 6	26.1
SS-13	23.0-25.0	21"R	1, 11, 21, 9	19.0
SS-14	25.0-27.0	24"R	2, 4, 2, 2	25.8
SS-15	27.0-29.0	22"R	4, 7, 9, 11	25.7
SS-16	29.0-31.0	24"R	WOH, WOH, 14, 18	23.1
SS-17A/B	31.0-33.0	18"R	10, 20, 3, 4	19.4, 17.9
SS-18	33.0-34.5	18"R	1, 2, 2, 3	22.7

Notes & Test Results: SS-11: PID=2.5ppm qu=0.6**tsf SS-12: PID=2.6ppm qu=0.6**tsf SS-13: PID=2.6ppm Gravel = 1% Sand = 63% Fines = 36% SS-14: PID=2.5ppm qu=0.7**tsf SS-15: PID=2.6ppm SS-16: PID=2.4ppm SS-17A: PID=2.4ppm Piezometer P-6D-96 installed in borehole. Piezometer P-6S-96 installed in offset borehole approximately 4.0' south. See installation

DRILLING CONTRACTOR Patrick Drilling
DRILLING METHOD 4 1/4" I.D. HSA
DRILLING EQUIPMENT CME 55 ATV
DRILLING STARTED 12/23/96 ENDED 12/23/96
REMARKS Piezometer P-6D-96 constructed in completed borehole. See installation
WATER LEVEL (ft.): ▽ 8.0' during drilling; ▼ 8.5' 1/13/97; ▼ 8.0 4/15/97

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Designed By TMM Checked By GMS
Drawn By JJF Checked By TMM