

**APPENDIX C –
WELL INSTALLATION LOGS**

APPENDIX C.1
TEMPORARY WELLS

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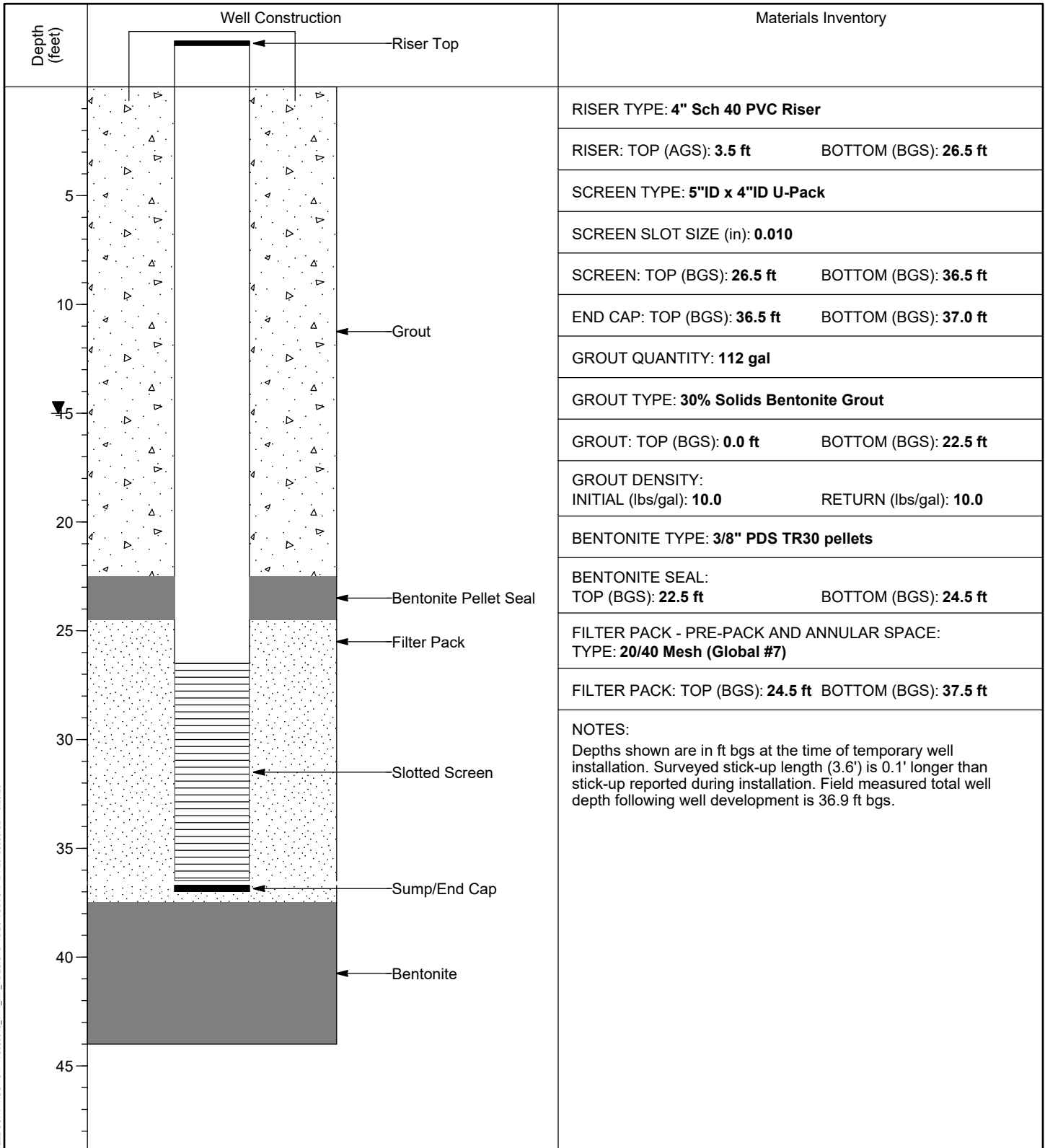


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: PAGE 1 OF 1
KIF-TW01 (Boring KIF-TW01)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes**
 OBSERVED BY: **D. Mihalek**
 REVIEWED BY: **P. Dunne**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **1/29/19** COMPLETED: **1/30/19**
 LOCATION: **576,050.03 N; 2,407,660.05 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 24.21"** LONGITUDE: **-84° 31' 1.27"**
 GROUND ELEV (ft): **771.8** TOC ELEV (ft): **775.36**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **44.0** WELL DEPTH (ft, bgs): **37.0**
 DTW AT COMPLETION (ft, bgs): **15.0**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



WELL CONSTRUCTION 175668043_TVA_KIF_TDEC.GPJ, TDEC SUBSURF_DT_20190530.GDT 6/29/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

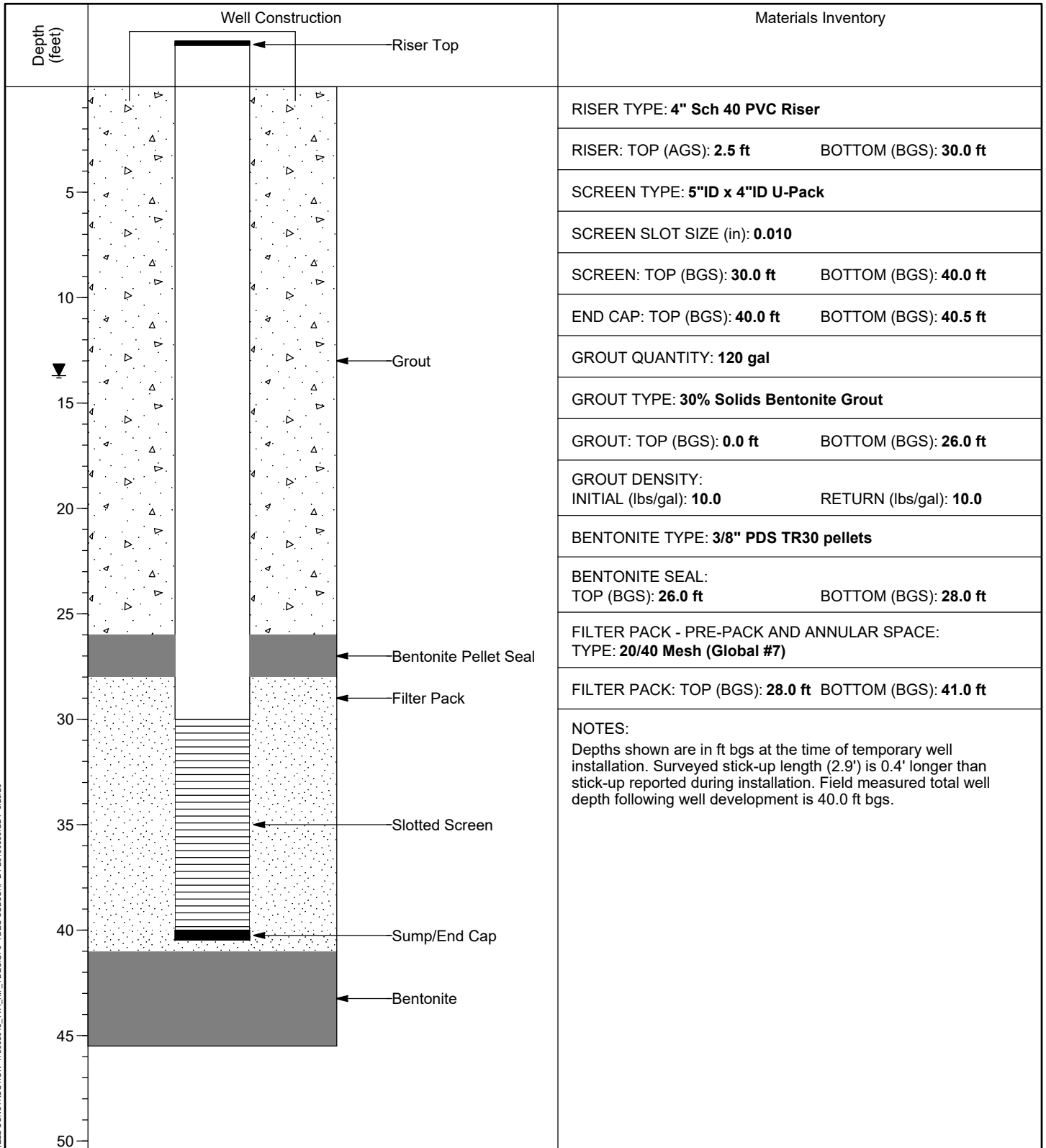


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: PAGE 1 OF 1
KIF-TW02 (Boring KIF-TW02)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes**
 OBSERVED BY: **D. Mihalek**
 REVIEWED BY: **P. Dunne**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **2/6/19** COMPLETED: **2/7/19**
 LOCATION: **575,548.50 N; 2,407,585.76 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 19.26"** LONGITUDE: **-84° 31' 2.27"**
 GROUND ELEV (ft): **771.9** TOC ELEV (ft): **774.73**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **45.5** WELL DEPTH (ft, bgs): **40.5**
 DTW AT COMPLETION (ft, bgs): **13.7**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



WELL CONSTRUCTION 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20190530.GDT 6/29/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

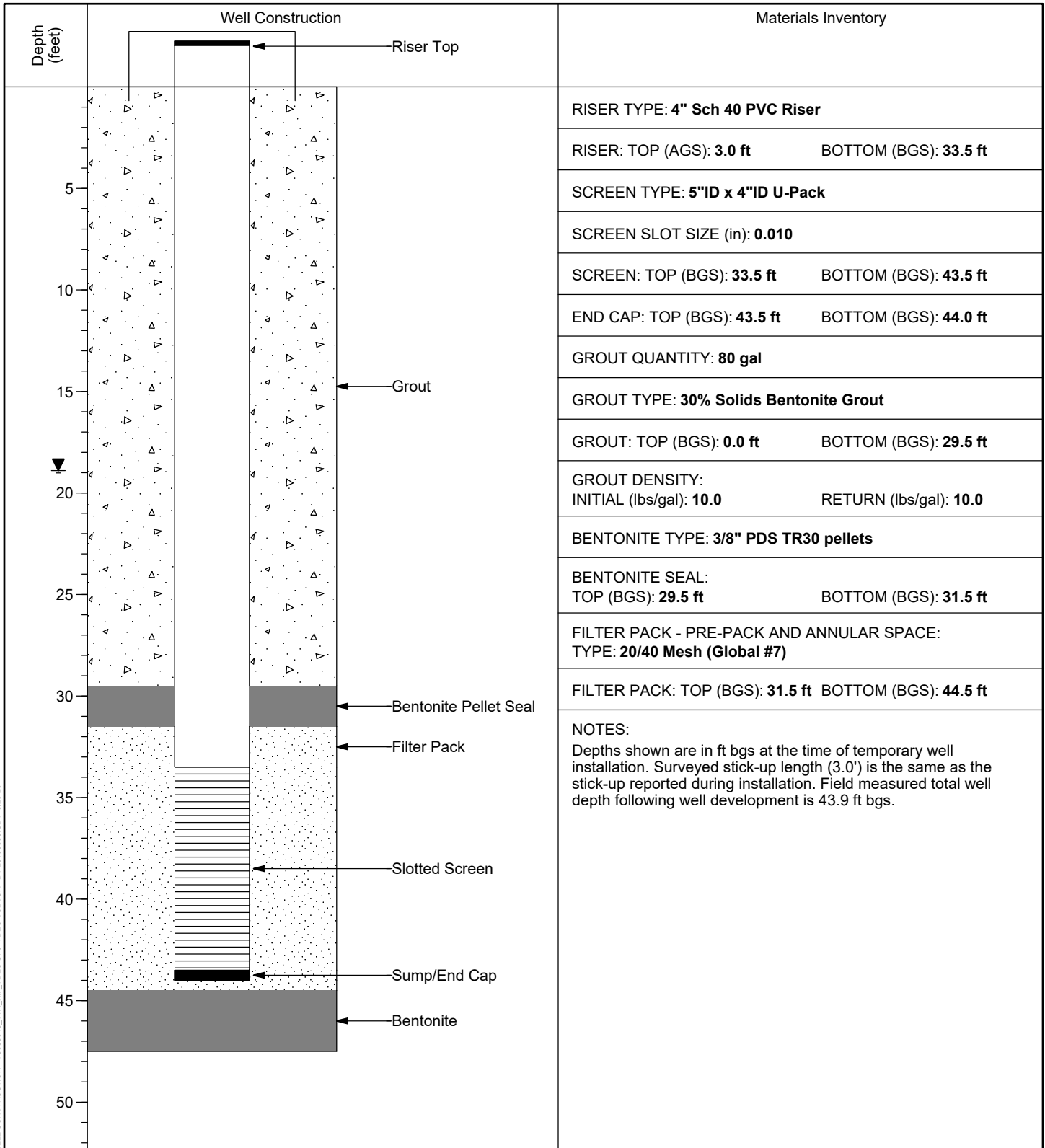


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: **KIF-TW03 (Boring KIF-TW03)** PAGE 1 OF 1

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes**
 OBSERVED BY: **D. Mihalek**
 REVIEWED BY: **P. Dunne**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **2/26/19** COMPLETED: **2/27/19**
 LOCATION: **575,720.53 N; 2,408,211.78 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 20.87"** LONGITUDE: **-84° 30' 54.63"**
 GROUND ELEV (ft): **776.0** TOC ELEV (ft): **778.90**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **47.5** WELL DEPTH (ft, bgs): **44.0**
 DTW AT COMPLETION (ft, bgs): **18.9**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



WELL CONSTRUCTION 175668043_TVA_KIF_TDEC.GPJ_TDEC SUBSURF DT 20190530.GDT 6/29/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

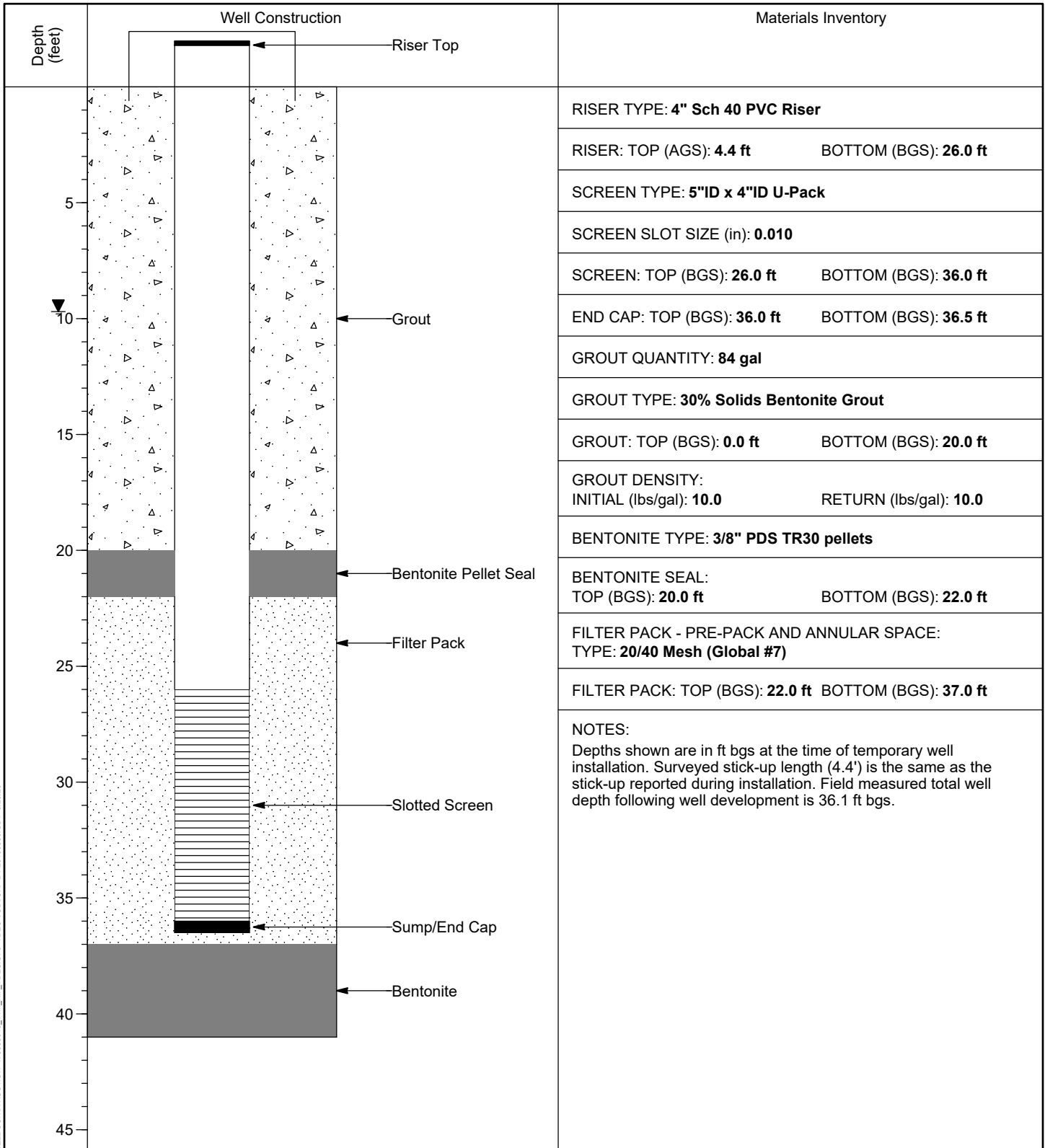


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: PAGE 1 OF 1
KIF-TW04 (Boring KIF-TW04)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes**
 OBSERVED BY: **M. Edmunds**
 REVIEWED BY: **P. Dunne**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **2/13/19** COMPLETED: **2/14/19**
 LOCATION: **574,754.11 N; 2,407,855.14 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 11.36"** LONGITUDE: **-84° 30' 59.14"**
 GROUND ELEV (ft): **765.2** TOC ELEV (ft): **769.60**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **41.0** WELL DEPTH (ft, bgs): **36.5**
 DTW AT COMPLETION (ft, bgs): **9.7**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



WELL CONSTRUCTION 175668043_TVA_KIF_TDEC.GPJ, TDEC SUBSURF_DT_20190530.GDT 6/29/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

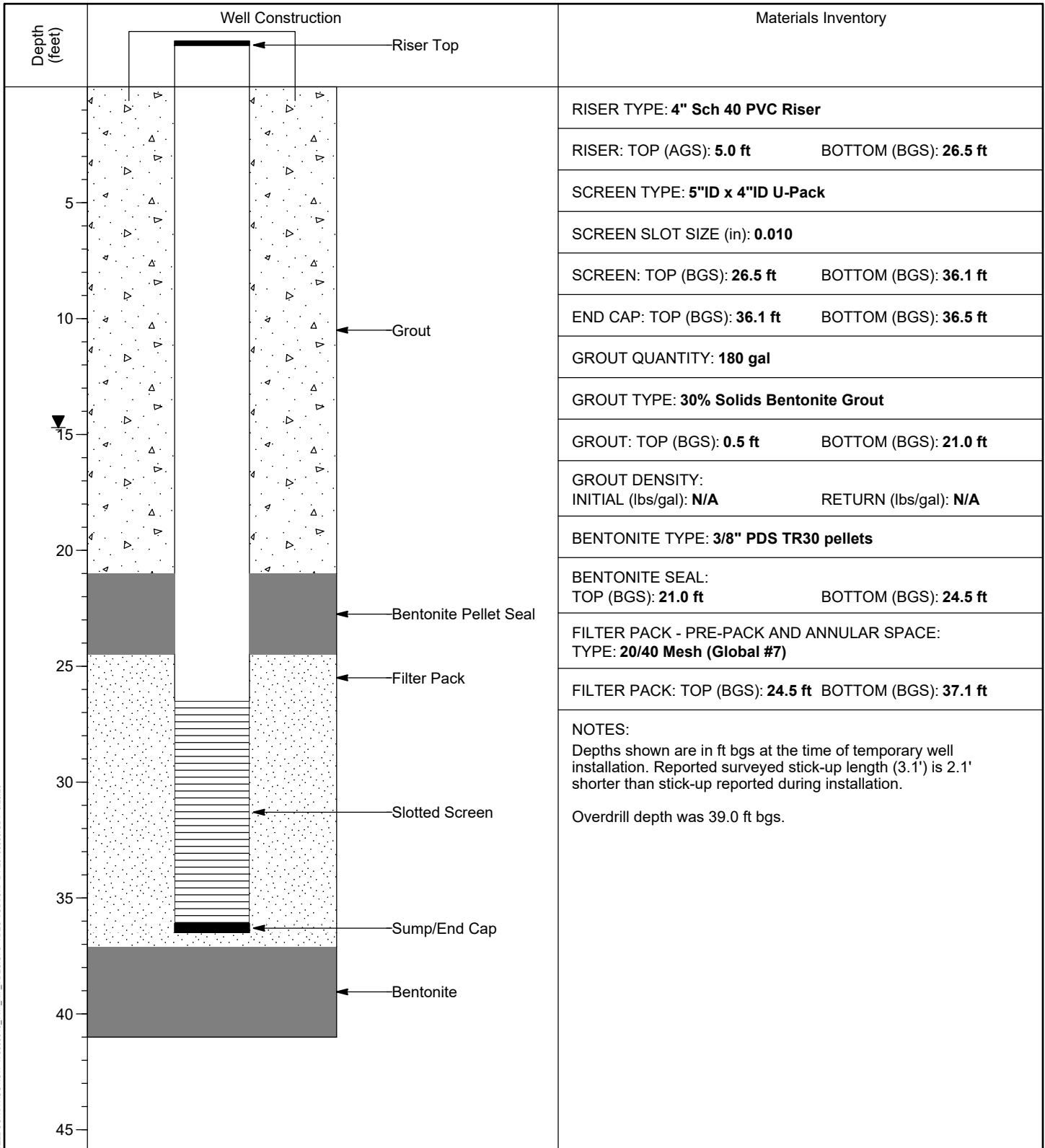


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: PAGE 1 OF 1
KIF-TW05 (Boring KIF-TW05)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 850XR, #953**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 3" SS w/o liners, 3" Shelby Tubes**
 OBSERVED BY: **G. Budd**
 REVIEWED BY: **P. Dunne**
 APPROVED BY: **L. Price**

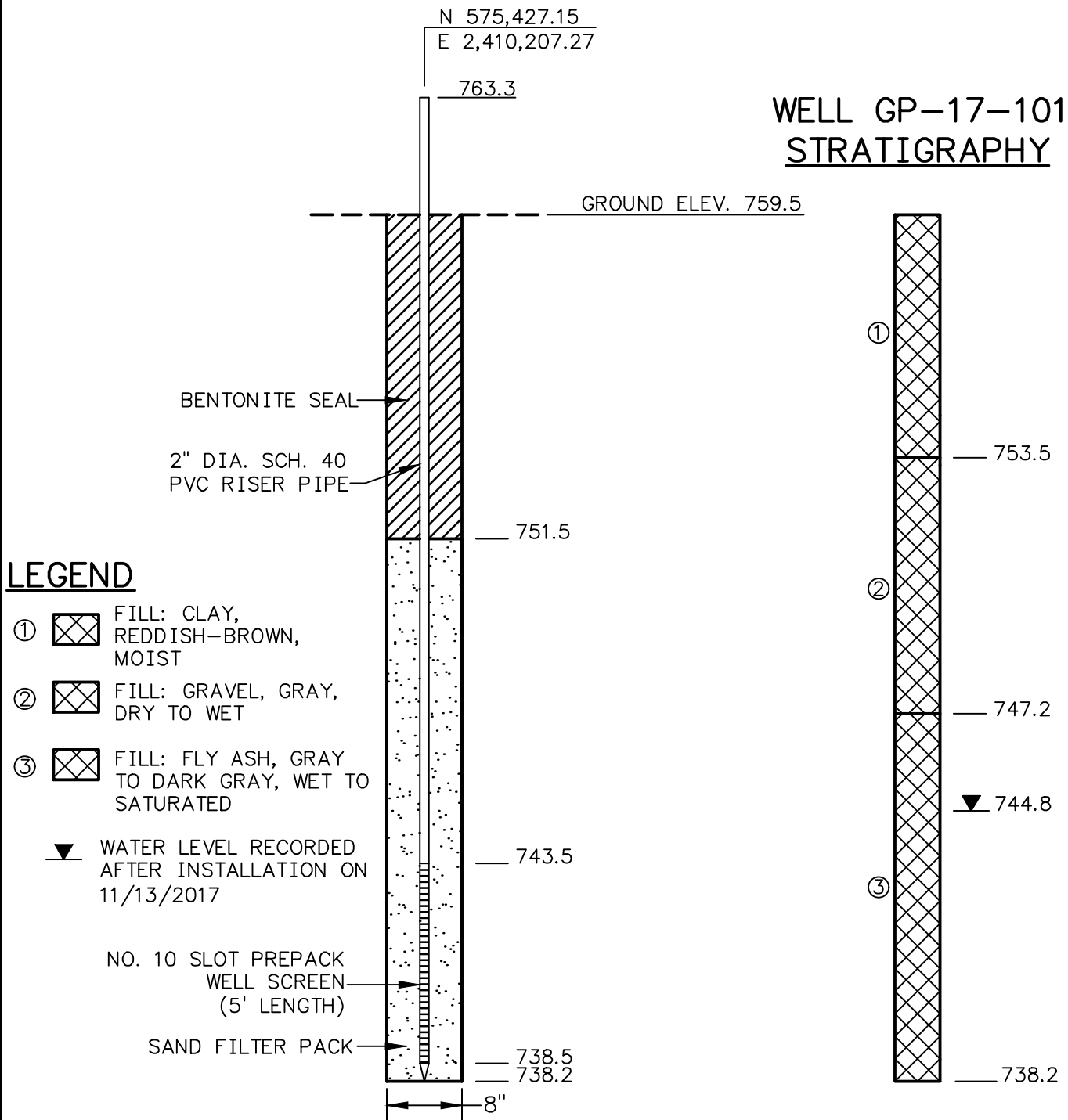
INSTALLATION: STARTED: **11/13/18** COMPLETED: **11/14/18**
 LOCATION: **575,382.75 N; 2,408,921.34 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 17.42"** LONGITUDE: **-84° 30' 46.07"**
 GROUND ELEV (ft): **770.5** TOC ELEV (ft): **773.59**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **41.0** WELL DEPTH (ft, bgs): **36.5**
 DTW AT COMPLETION (ft, bgs): **14.7**
 BOREHOLE DIA. (in): **13.0** WELL DIA. (in): **4.0**



WELL CONSTRUCTION 175668043_TVA_KIF_TDEC.GPJ, TDEC SUBSURF_DT_20190530.GDT 6/29/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

WELL GP-17-101 STRATIGRAPHY



LEGEND

- ① FILL: CLAY, REDDISH-BROWN, MOIST
- ② FILL: GRAVEL, GRAY, DRY TO WET
- ③ FILL: FLY ASH, GRAY TO DARK GRAY, WET TO SATURATED
- WATER LEVEL RECORDED AFTER INSTALLATION ON 11/13/2017

NO. 10 SLOT PREPACK WELL SCREEN (5' LENGTH)
 SAND FILTER PACK

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG GP-17-101 ON 11/10/2017.
2. SURVEY INFORMATION PROVIDED BY STANTEC (NAD83/NGVD29 SHOWN).
3. WELL INSTALLED ON 11/10/2017 BY S&ME.

PLOT DATE: 01/31/2018 USER: PETTY, RICHARD
 U:\175618610\TECHNICAL_PRODUCTION\DRAWING\SHEET_FILES\KIF_17_101.DWG

GP-17-101 OBSERVATION WELL INSTALLATION DETAIL TVA KINGSTON FOSSIL PLANT KINGSTON, ROANE COUNTY, TN

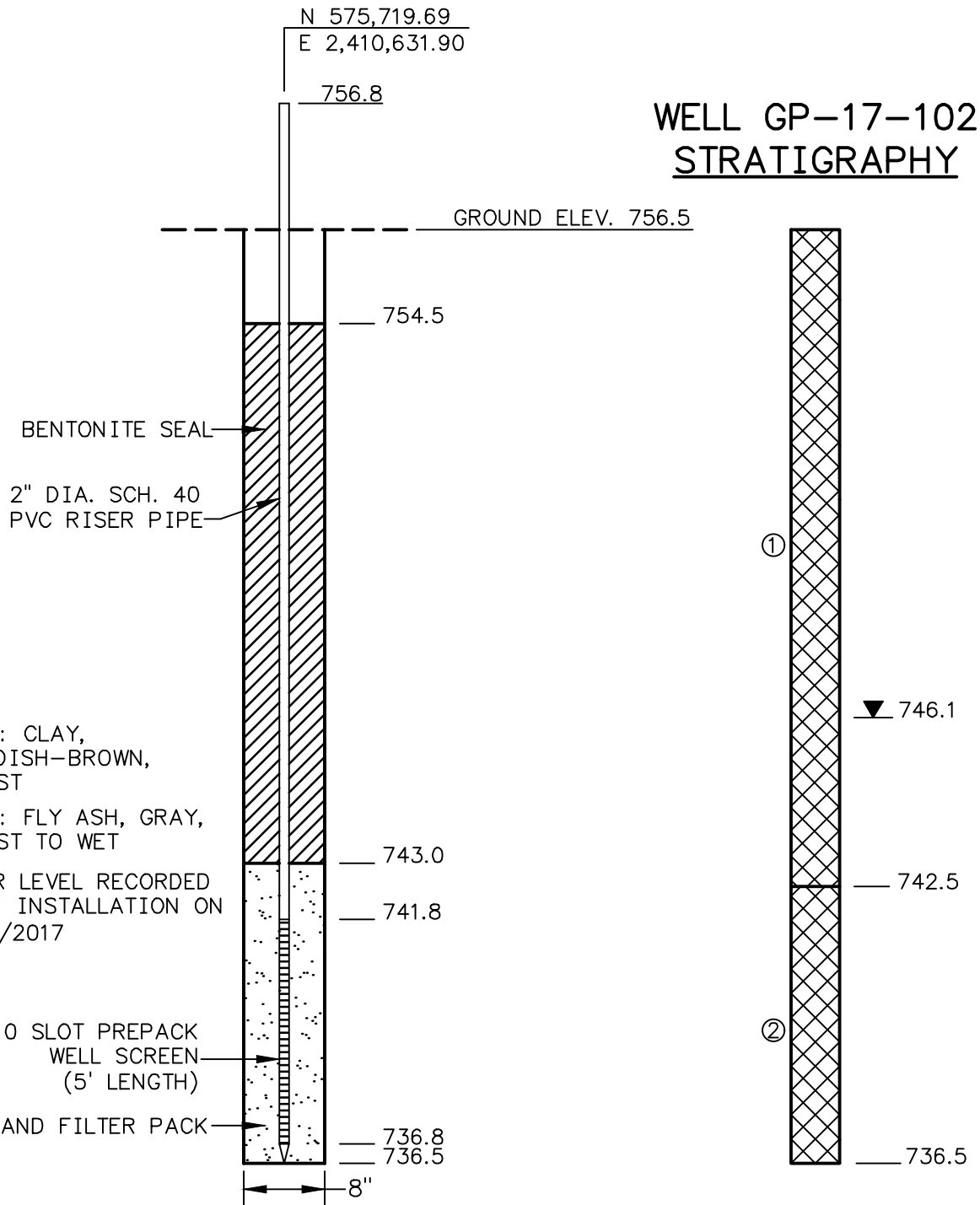


Stantec




Stantec Consulting Services Inc.
 1110 Market Street, Suite 214A
 Chattanooga, Tennessee 37402
 423-800-5350
 www.stantec.com

DRAWN BY	RRP	DATE	JAN. 2018	REVISED		SHEET
CHECKED BY	BGB	PROJ. NO.	175618610	1.	3.	2 of 4
CHECKED BY	PT	SCALE	NTS	2.	4.	

WELL GP-17-102 STRATIGRAPHY



LEGEND

- ①  FILL: CLAY, REDDISH-BROWN, MOIST
- ②  FILL: FLY ASH, GRAY, MOIST TO WET
-  WATER LEVEL RECORDED AFTER INSTALLATION ON 11/13/2017

NO. 10 SLOT PREPACK
WELL SCREEN
(5' LENGTH)

SAND FILTER PACK

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG GP-17-102 ON 11/9/2017.
2. SURVEY INFORMATION PROVIDED BY STANTEC (NAD83/NGVD29 SHOWN).
3. WELL INSTALLED ON 11/9/2017 BY S&ME.

GP-17-102 OBSERVATION WELL INSTALLATION DETAIL TVA KINGSTON FOSSIL PLANT KINGSTON, ROANE COUNTY, TN



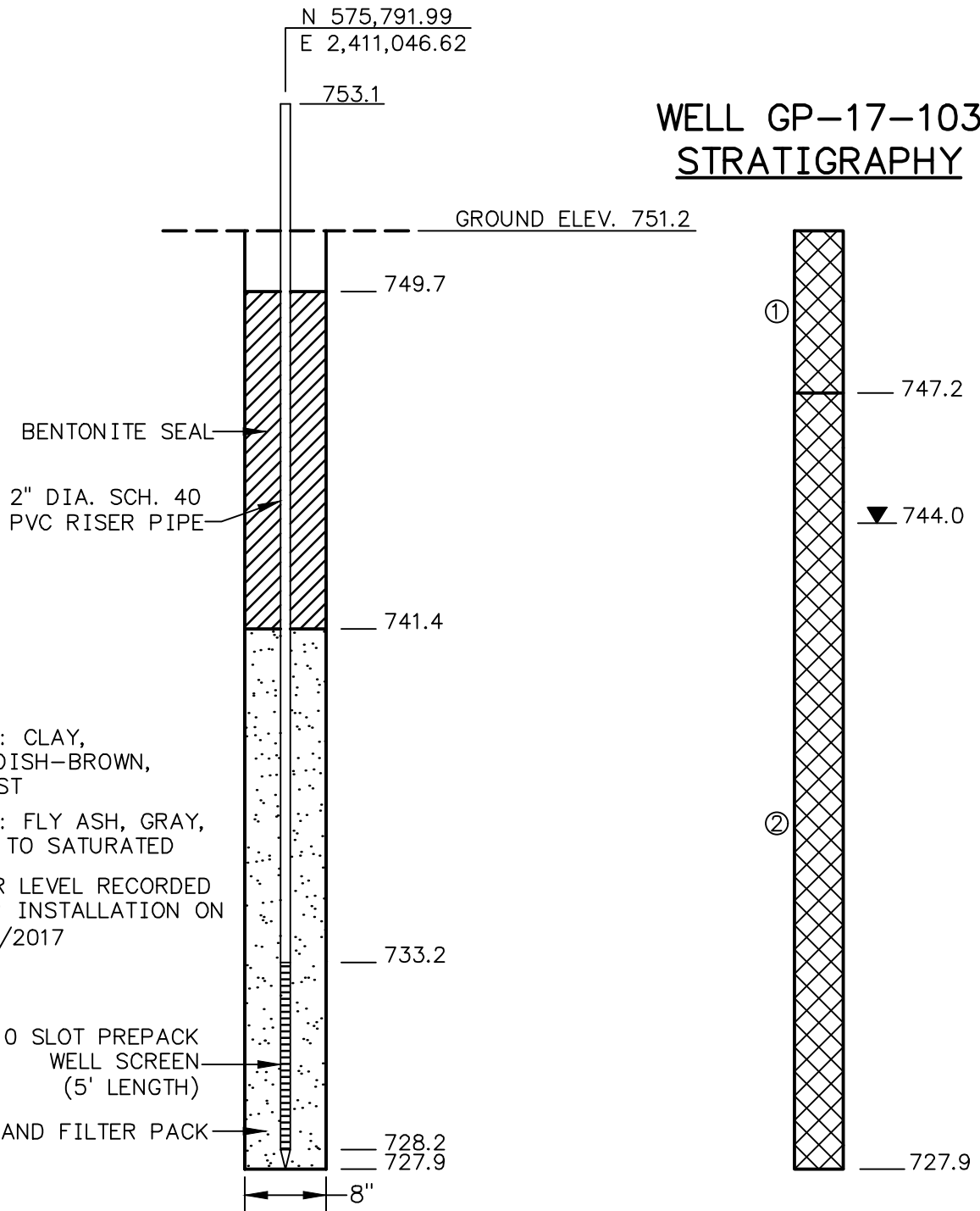
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DRAWN BY	RRP	DATE	JAN. 2018	REVISED		SHEET
CHECKED BY	BGB	PROJ. NO.	175618610	1.	3.	3 of 4
CHECKED BY	PT	SCALE	NTS	2.	4.	

PLOT DATE: 01/31/2018 USER: PETTY, RICHARD
U:\175618610\TECHNICAL_PRODUCTION\DRAWING\SHEET_FILES\KTF_GP_17_102.DWG

WELL GP-17-103 STRATIGRAPHY



LEGEND

- ① FILL: CLAY, REDDISH-BROWN, MOIST
- ② FILL: FLY ASH, GRAY, WET TO SATURATED
- WATER LEVEL RECORDED AFTER INSTALLATION ON 11/13/2017

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG GP-17-103 ON 11/8/2017.
2. SURVEY INFORMATION PROVIDED BY STANTEC (NAD83/NGVD29 SHOWN).
3. WELL INSTALLED ON 11/8/2017 BY S&ME.

PLOT DATE: 01/31/2018 USER: PETTY, RICHARD
 U:\175618610\TECHNICAL_PRODUCTION\DRAWING\SHEET_FILES\KTF_GP_17_103.DWG

GP-17-103 OBSERVATION WELL INSTALLATION DETAIL TVA KINGSTON FOSSIL PLANT KINGSTON, ROANE COUNTY, TN



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DRAWN BY	RRP	DATE	JAN. 2018	REVISED		SHEET
CHECKED BY	BGB	PROJ. NO.	175618610	1.	3.	4 of 4
CHECKED BY	PT	SCALE	NTS	2.	4.	

APPENDIX C.2

PIEZOMETERS

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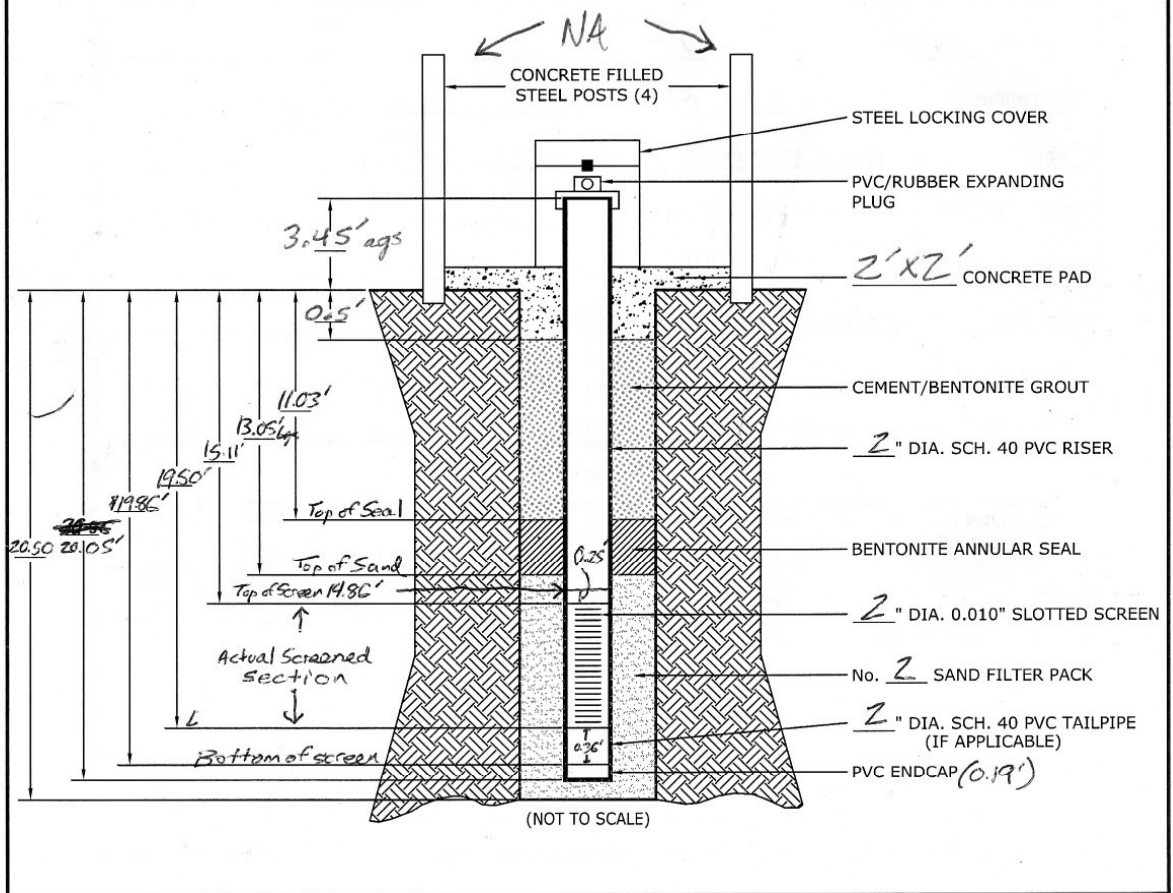
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PZ-D1B.....	2
KIF-B05.....	3
KIF-B09.....	4
KIF-B13.....	5
STN-48B.....	6
PZ-126 A and B.....	7
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PZ-C1B.....	9
PZ-C2.....	10
SPT-17-01.....	11
SPT-17-02.....	12
SPT-17-03.....	13

Written by: J. Sura / Y. Cao Date: 10/29/10 Reviewed by: Neil Davis Date: 10/29/10

Client: TVA Project: Dredge Cells Recovery Project/ Proposal No.: GR4327 Task No.: 105

PIEZOMETER INSTALLATION RECORD

JOB NAME TVA KINGSTON - EAST DIKE JOB NUMBER 3043101038
 WELL NUMBER PZ-D1A INSTALLATION DATE 8/25/2010
 DRILLED BY TRISTATE - GEORGE AKINS
 BOREHOLE DIAMETER 8" RISER/SCREEN MATERIAL Schedule 40 PVC
 TOTAL DEPTH 20.5' bgs DIAMETER 2"
 FIELD REPRESENTATIVE Rodney M. Clark SLOT SIZE 0.010"



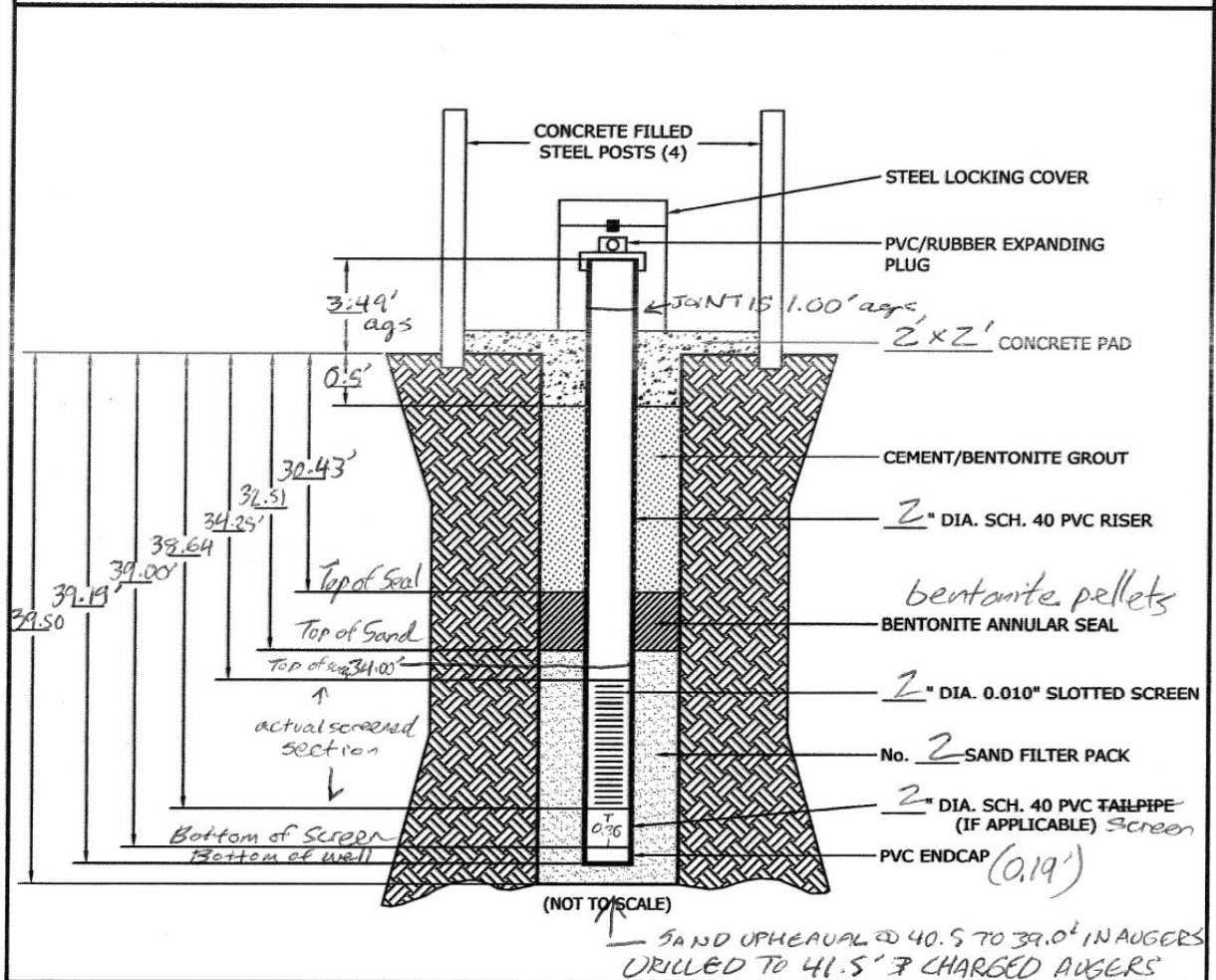
Written by: J. Sura / Y. Cao Date: 10/29/10 Reviewed by: Neil Davis Date: 10/29/10

Client: TVA Project: Dredge Cells Recovery Project/ Proposal No.: GR4327 Task No.: 105

Revision

PIEZOMETER INSTALLATION RECORD

JOB NAME TVA KINGSTON EAST DIKE JOB NUMBER 3043101038
 WELL NUMBER PZ-D1B offset INSTALLATION DATE 8/26/10
 DRILLED BY Tristate (George Akers)
 BOREHOLE DIAMETER 8" RISER/SCREEN MATERIAL Schedule 40 PVC
 TOTAL DEPTH 39.50 DIAMETER 2"
 FIELD REPRESENTATIVE Rodney Clark SLOT SIZE 0.010"



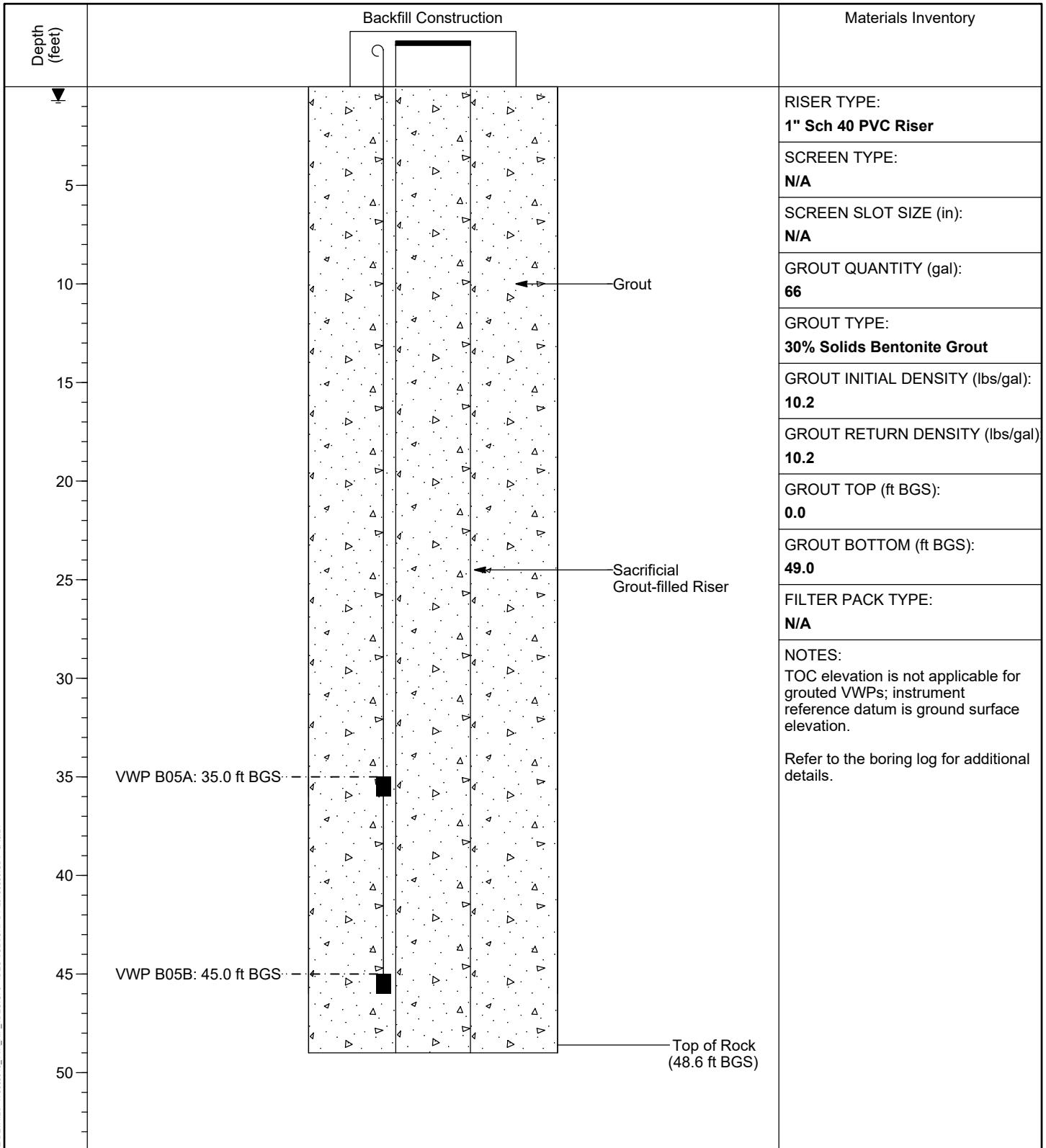


PIEZOMETER INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: **KIF-B05 (Boring KIF-B05)** PAGE 1 OF 1

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 SAMPLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 OBSERVED BY: **T. Greenwell**
 REVIEWED BY: **J. Musselman**
 APPROVED BY: **A. Welshans**

INSTALLATION: STARTED: **2/24/21** COMPLETED: **2/24/21**
 LOCATION: **574,498.86 N; 2,408,062.70 E DATUM: NAD83**
 LOC. DESCRIPTION: **East Dike perimeter road**
 LATITUDE: **35° 54' 8.8"** LONGITUDE: **-84° 30' 56.7"**
 GROUND ELEV (ft): **756.5** TOC ELEV (ft): **N/A**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **49.0** RISER DEPTH (ft): **49.0**
 DTW AT COMPLETION (ft, bgs): **0.7**
 BOREHOLE DIA. (in): **8.0** RISER DIA. (in): **1.0**



PZ DETAILS 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF.DT 20190530.GDT 8/13/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)



PIEZOMETER INSTALLATION DETAIL

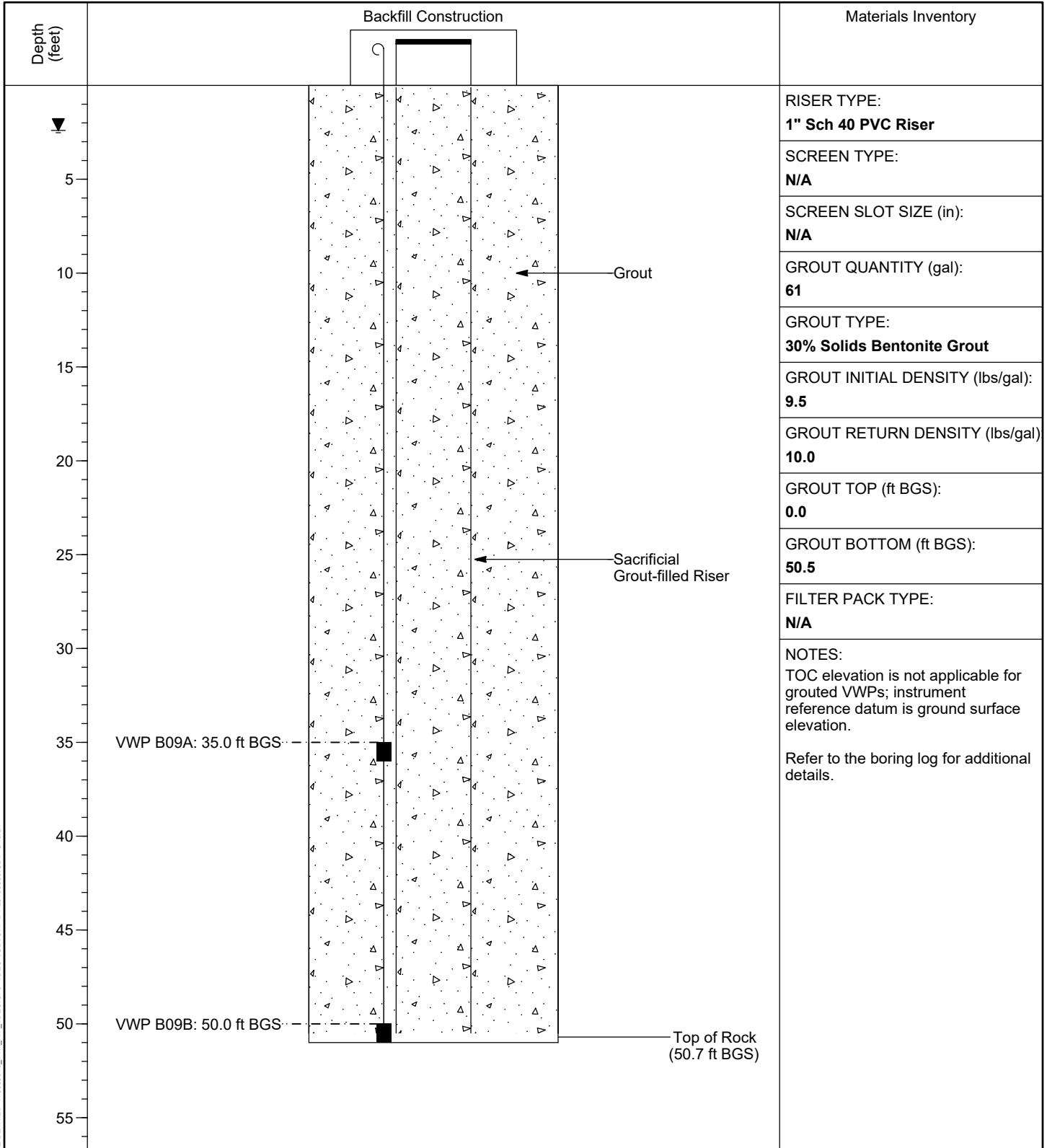
WELL / PROBEHOLE / BOREHOLE NO:

PAGE 1 OF 1

KIF-B09 (Boring KIF-B09)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 SAMPLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 OBSERVED BY: **T. Greenwell**
 REVIEWED BY: **J. Musselman**
 APPROVED BY: **A. Welshans**

INSTALLATION: STARTED: **2/25/21** COMPLETED: **2/25/21**
 LOCATION: **574,620.91 N; 2,408,217.76 E DATUM: NAD83**
 LOC. DESCRIPTION: **East Dike perimeter road**
 LATITUDE: **35° 54' 10.0"** LONGITUDE: **-84° 30' 54.8"**
 GROUND ELEV (ft): **754.5** TOC ELEV (ft): **N/A**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **51.8** RISER DEPTH (ft): **50.5**
 DTW AT COMPLETION (ft, bgs): **2.4**
 BOREHOLE DIA. (in): **8.0** RISER DIA. (in): **1.0**



PZ DETAILS 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF.DT 20190630.GDT 8/13/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)



PIEZOMETER INSTALLATION DETAIL

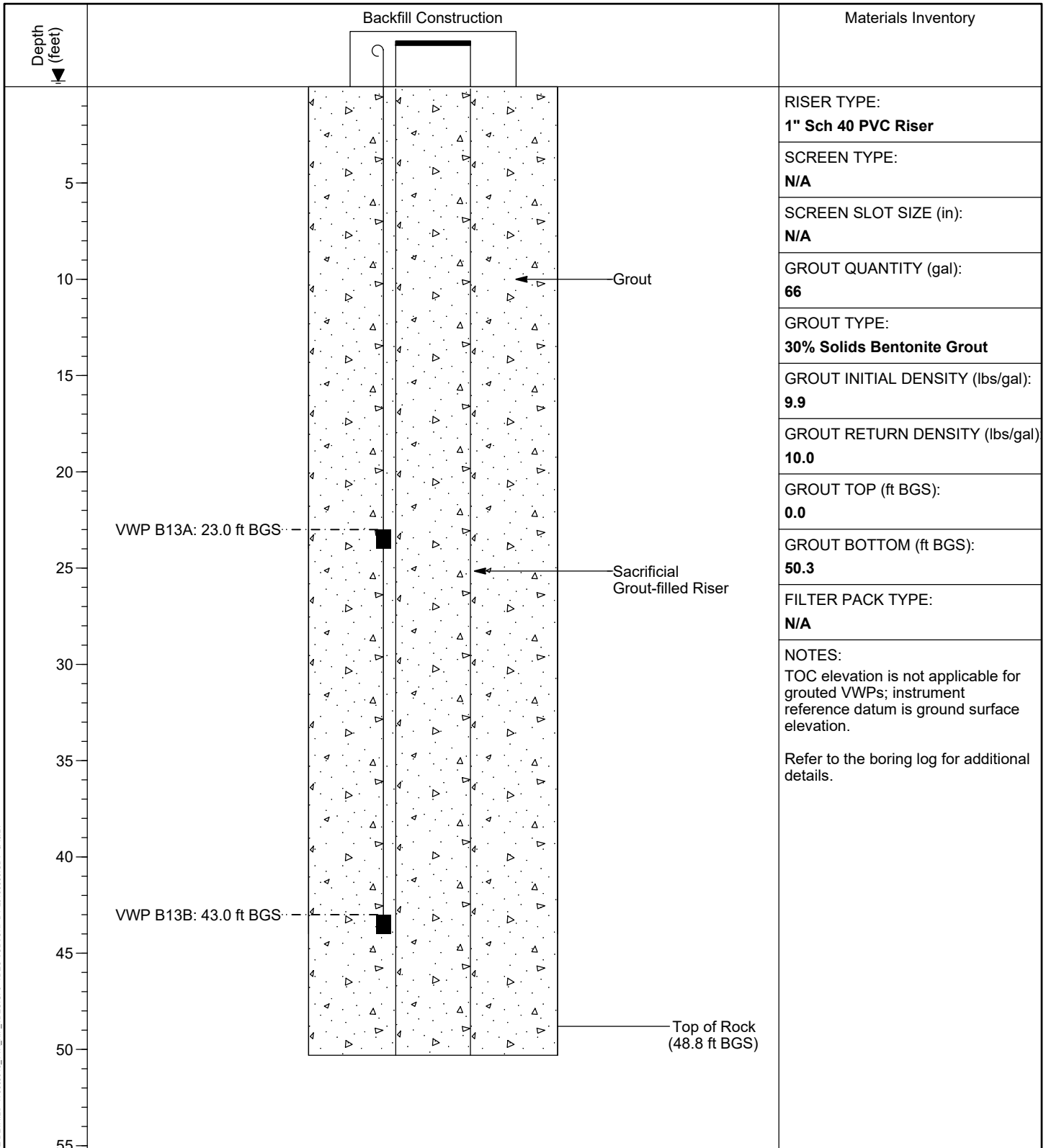
WELL / PROBEHOLE / BOREHOLE NO:

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KIF-B13 (Boring KIF-B13)

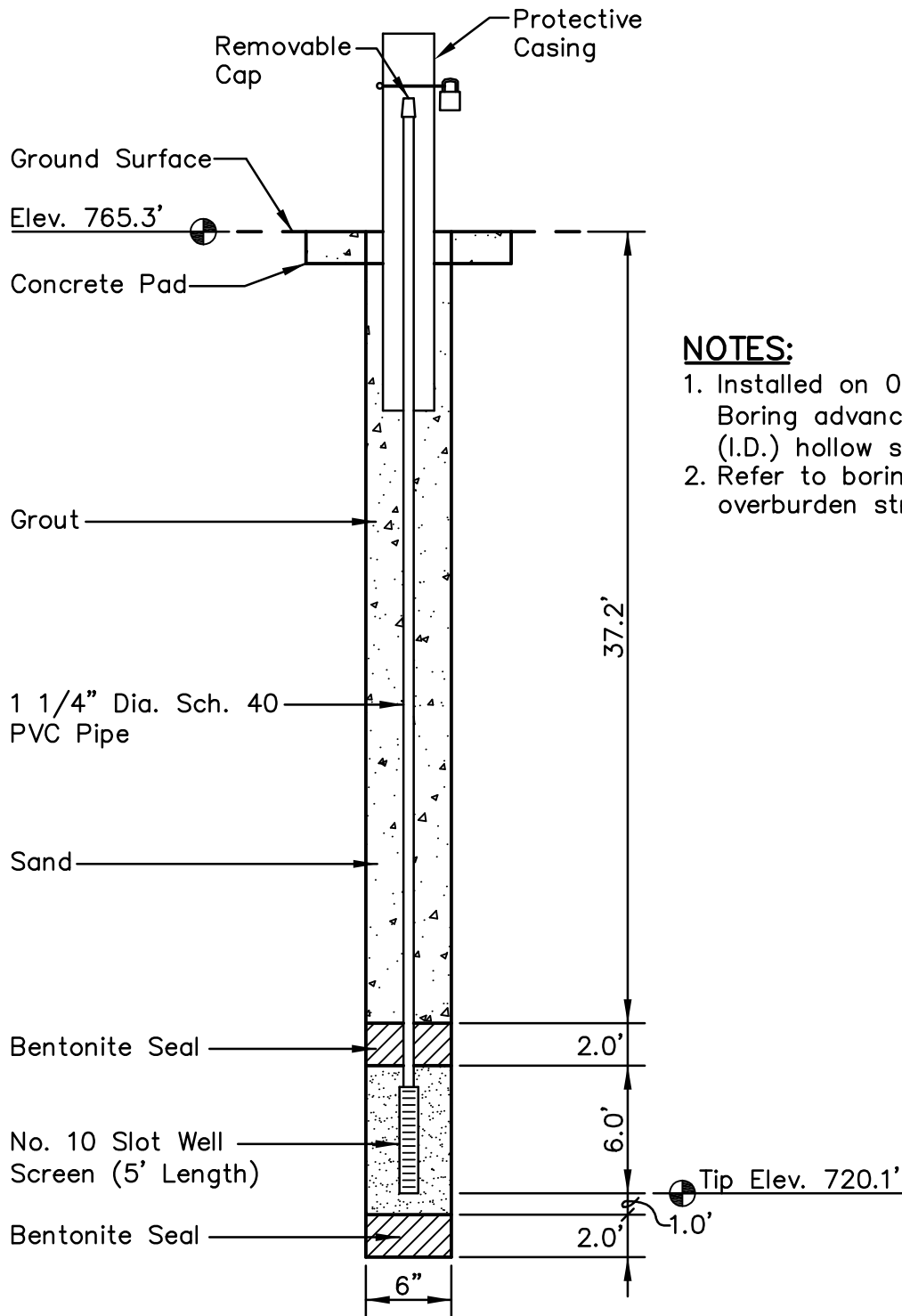
PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 55T#1, #709**
 DRILLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 SAMPLING METHOD: **4-5/8" 3-Wing Updraft Bit, 2" SS w/o liners, 3" ST**
 OBSERVED BY: **T. Greenwell**
 REVIEWED BY: **J. Musselman**
 APPROVED BY: **A. Welshans**

INSTALLATION: STARTED: **2/14/21** COMPLETED: **2/14/21**
 LOCATION: **574,919.10 N; 2,408,553.07 E DATUM: NAD83**
 LOC. DESCRIPTION: **East Dike perimeter road**
 LATITUDE: **35° 54' 50.6"** LONGITUDE: **-84° 30' 50.6"**
 GROUND ELEV (ft): **753.2** TOC ELEV (ft): **N/A**
 ELEVATION DATUM: **NGVD29**
 BOREHOLE DEPTH (ft): **50.3** RISER DEPTH (ft): **50.3**
 DTW AT COMPLETION (ft, bgs): **-0.3**
 BOREHOLE DIA. (in): **8.0** RISER DIA. (in): **1.0**



PZ DETAILS 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF.DT 20190630.GDT 8/13/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)



NOTES:

1. Installed on 04/21/2009. Boring advanced with 3.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.

LOCATION:

Northing: 553,769.40
 Easting: 2,441,163.30
 Ground Elevation: 765.3 feet

Locations to be provided by TVA, Power Systems Operations, Surveying and Project Services.

Horizontal Datum: NAD 27
 Vertical Datum: NGVD29

**PIEZOMETER STN-48B
 ASH POND STABILITY
 KINGSTON FOSSIL PLANT**



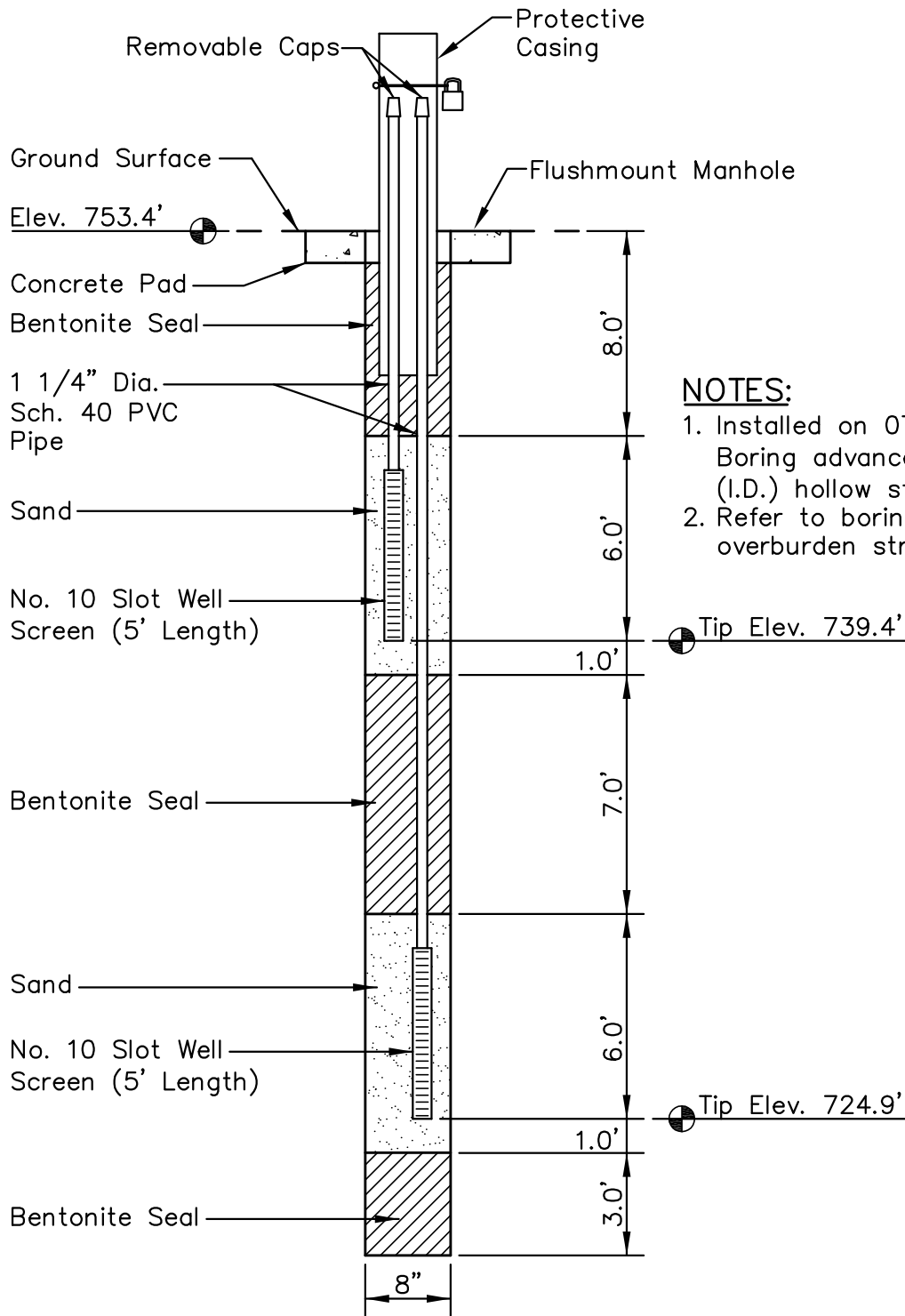
Stantec

Stantec Consulting Services Inc.
 1409 N. Forbes Rd.
 Lexington, Kentucky
 40511-2050
 859-422-3000

www.stantec.com

DRAWN BY	TJ	DATE	JUNE, 2009	REVISED		SHEET 1 OF 1
CHECKED BY	ZCM	PROJ. NO.	175569042	1.	3.	
CHECKED BY	AAC	SCALE	NTS	2.	4.	

PLOT DATE: 06/30/2009 USER: FLYNN, RENEE V: \\1755\ACTIVE\175569042\GEO\TECHNICAL\DRAWING\INSTRUMENTS\69042C-KIF-301-PZ48B.DWG



NOTES:

1. Installed on 07/06/2010. Boring advanced with 4.25" (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.

LOCATION:

Northing: 555,194.95
 Easting: 2,442,895.83
 Ground Elevation: 753.4 feet

Locations to be provided by
 TVA, Power Systems
 Operations, Surveying and
 Project Services.

Horizontal Datum: NAD 27
 Vertical Datum: NGVD29

**PIEZOMETER PZ-126 A AND B
 DIKE C STABILITY
 KINGSTON FOSSIL PLANT**



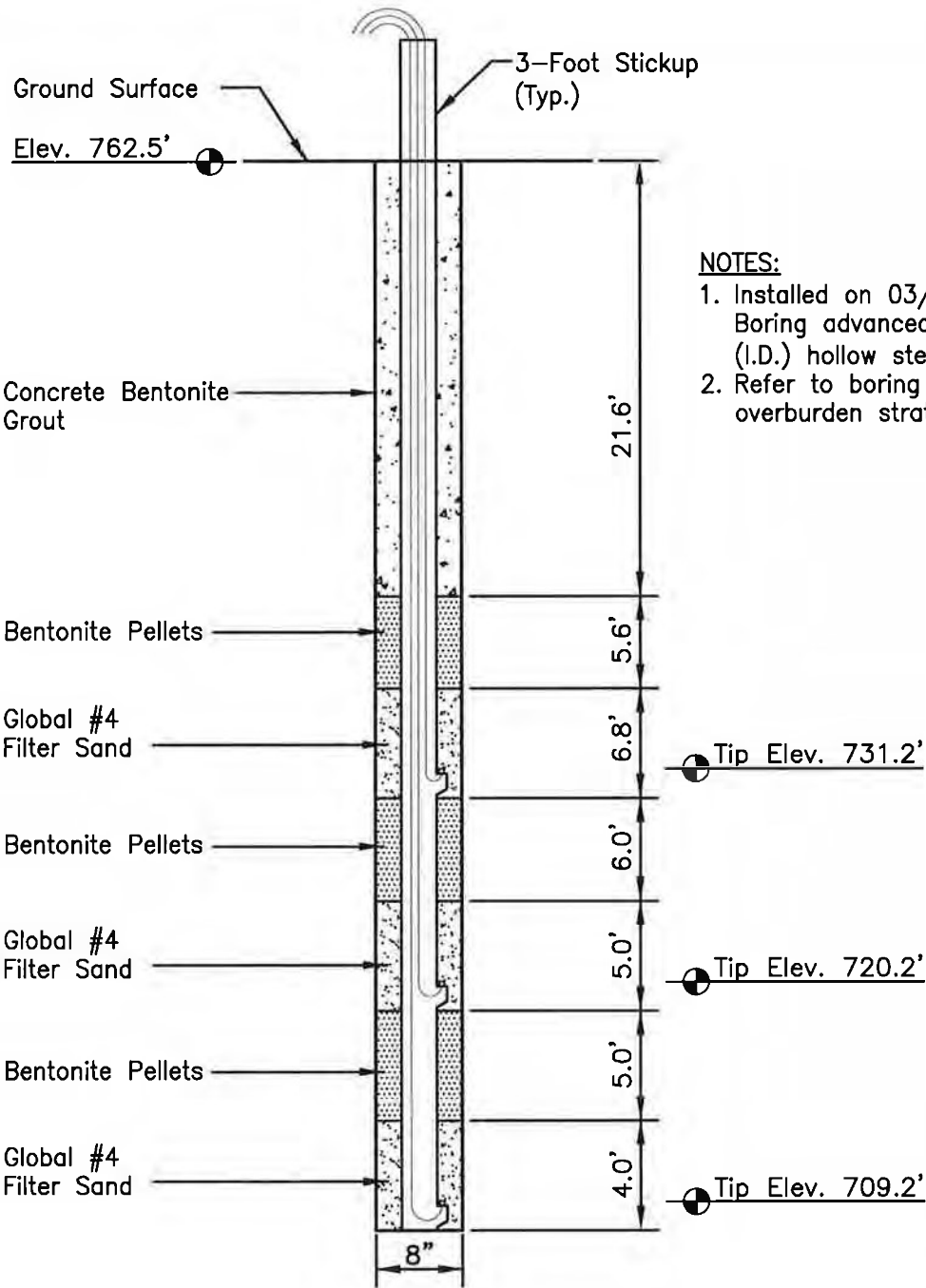
Stantec

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 Services Inc.
 1409 N. Forbes Rd.
 Lexington, Kentucky
 40511-2050
 859-422-3000

www.stantec.com

DRAWN BY	RP	DATE	JULY, 2010	REVISED	
CHECKED BY	MLJ	PROJ. NO.	175669015	1.	3.
CHECKED BY	MS	SCALE	NTS	2.	4.

SHEET
1 OF 1



NOTES:

1. Installed on 03/30/2011. Boring advanced with 4.25-inch (I.D.) hollow stem augers.
2. Refer to boring log for overburden stratigraphy.

LOCATION

Northing: 554950.52
 Easting: 2442001.66
 Ground Elevation: 762.5 feet

Locations provided by TVA, Power Systems Operations, Surveying and Project Services, April, 2011.
 Horizontal Datum: NAD 27 (Tennessee Lambert)
 Vertical Datum: NGVD29

**VIBRATING WIRE PIEZOMETER PZ-E17
 KINGSTON FOSSIL PLANT
 LATERAL EXPANSION**



Stantec

Stantec Consulting Services Inc.
 1409 N. Forbee Rd.
 Lexington, Kentucky
 40511-2050
 858-422-3000

www.stantec.com

DRAWN BY	SB	DATE	April, 2011	REVISED		SHEET
CHECKED BY	MJ	PROJ. NO.	175661005	1.	3.	
CHECKED BY	AL	SCALE	NTS	2.	4.	

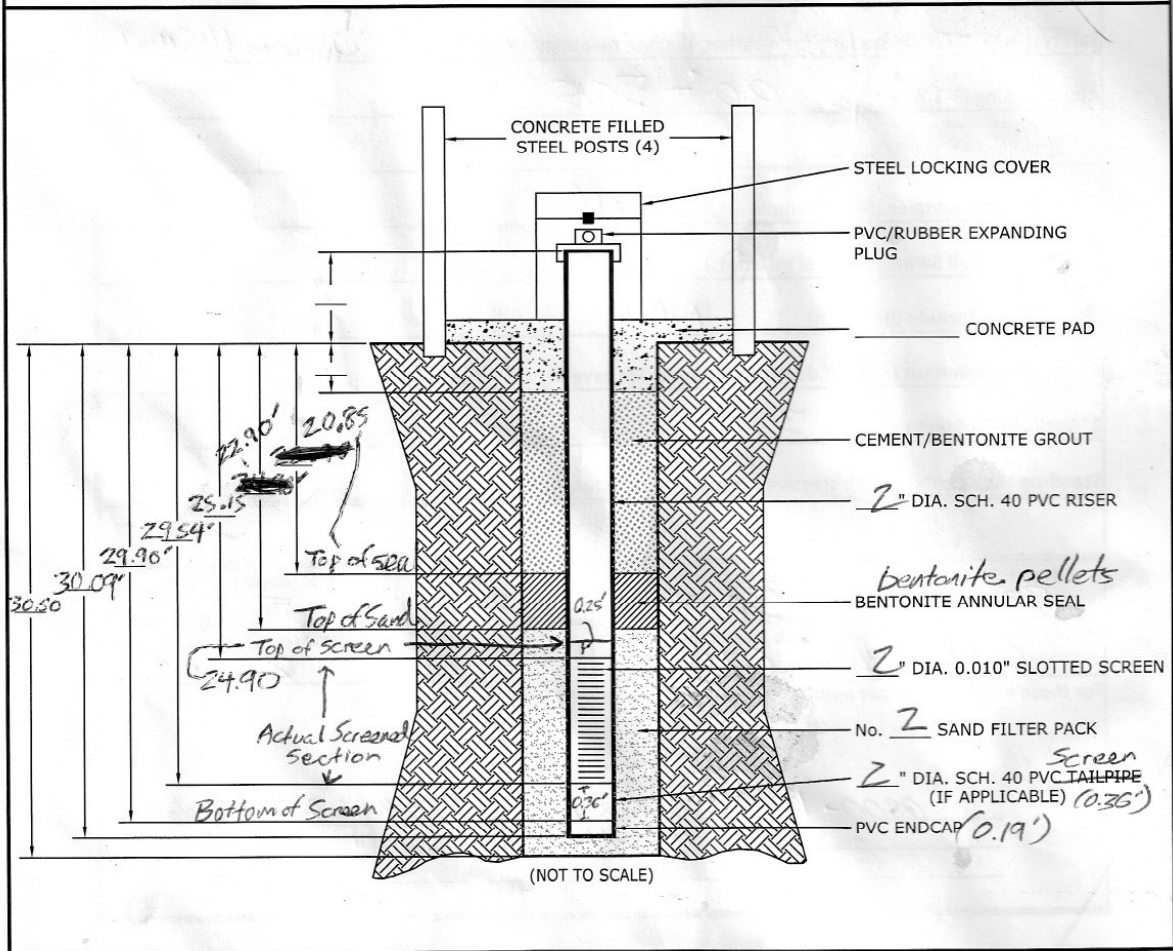
1 OF 1

Written by: J. Sura / Y. Cao Date: 10/29/10 Reviewed by: Neil Davis Date: 10/29/10

Client: TVA Project: Dredge Cells Recovery Project/ Proposal No.: GR4327 Task No.: 105

PIEZOMETER INSTALLATION RECORD

JOB NAME TVA KINGSTON - EAST DIKE JOB NUMBER 3043101038
 WELL NUMBER PZ-C1B INSTALLATION DATE 8/27/10
 DRILLED BY TRISTATE (GEORGE AKINS)
 BOREHOLE DIAMETER 8" RISER/SCREEN MATERIAL Schedule 40 PVC
 TOTAL DEPTH 30.09' DIAMETER 2"
 FIELD REPRESENTATIVE RODNEY CLARK SLOT SIZE 0.010"

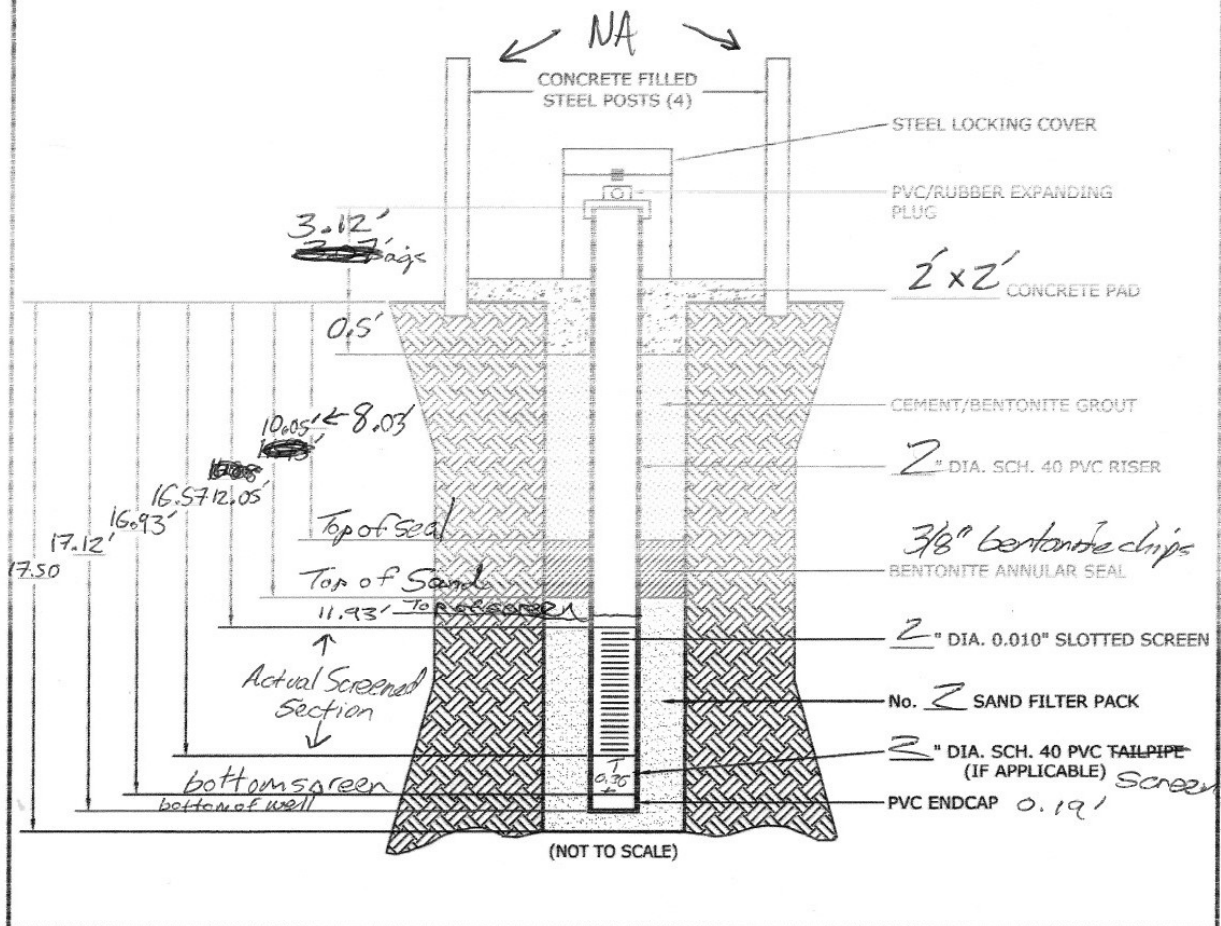


Written by: J. Sura / Y. Cao Date: 10/29/10 Reviewed by: Neil Davis Date: 10/29/10

Client: TVA Project: Dredge Cells Recovery Project/ Proposal No.: GR4327 Task No.: 105

PIEZOMETER INSTALLATION RECORD

JOB NAME TVA KINGSTON EAST DIKE JOB NUMBER 3043-10-1038
 WELL NUMBER PZ-CZ INSTALLATION DATE 8/31/2010
 BOREHOLE DIAMETER 8" DRILLED BY TRISTATE
 TOTAL DEPTH 17.5' RISER/SCREEN MATERIAL Schedule 40 PVC
 FIELD REPRESENTATIVE Rodney Clark DIAMETER 2"
 SLOT SIZE 0.010"



DATA ACQUISITION
(DATA RECORDER OR
DATA LOGGER)

SURFACE PROTECTION
TO BE PROVIDED BY TVA

GROUND SURFACE

ELEV. 755.0'

NOTES:

1. INSTALLED ON 10/07/2017.
2. VIBRATING WIRE
TRANSDUCERS ATTACHED TO
OUTSIDE OF SACRIFICIAL 1"
PVC CASING.
3. TRANSDUCERS SET IN
ALLUVIAL CLAY AND
ALLUVIAL SAND MATERIALS.

CEMENT-BENTONITE
GROUT

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702321

ELEV. 727.0'

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702327

ELEV. 720.0'

TOTAL DEPTH = 36.5'

DIA. 5 7/8"

PLOT DATE: 03/27/2018 USER: ELLISON, DOC V:\1756\ACTIVE\175664009\ENVIRONMENTAL\DRAWING\SHEET_FILES\KIF29\GEOTECH\INSTRUMENTS\SPT_17_01.DWG

**SPT-17-01
TVA KIF STILLING POND CLOSURE**



3052 Beaumont Centre Circle
Lexington, Kentucky 40513
www.stantec.com

DRAWN BY	RWE	DATE	03/28/2018
CHECKED BY	SEK	PROJ. NO.	175664009
CHECKED BY		SCALE	NTS
REVISED			SHEET
1.	-	3.	-
2.	-	4.	-
			1 OF 1

DATA ACQUISITION
(DATA RECORDER OR
DATA LOGGER)

SURFACE PROTECTION
TO BE PROVIDED BY TVA

GROUND SURFACE

ELEV. 754.3'

NOTES:

1. INSTALLED ON 10/30/2017.
2. VIBRATING WIRE
TRANSDUCERS ATTACHED TO
OUTSIDE OF SACRIFICIAL 1"
PVC CASING.
3. TRANSDUCERS SET IN
FOUNDATION ASH, ALLUVIAL
CLAY, AND ALLUVIAL SAND
MATERIALS.

CEMENT-BENTONITE
GROUT

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702318

ELEV. 733.3'

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702323

ELEV. 725.3'

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702326

ELEV. 712.3'

TOTAL DEPTH = 49.7'

DIA. 5 7/8"

PLOT DATE: 03/27/2018 USER: ELLISON, DOC
V:\1756\ACTIVE\175664009\ENVIRONMENTAL\DRAWING\SHEET_FILES\KIF29\GEOTECH\INSTRUMENTS\SPT_17_02.DWG

**SPT-17-02
TVA KIF STILLING POND CLOSURE**



3052 Beaumont Centre Circle
Lexington, Kentucky 40513
www.stantec.com

DRAWN BY	RWE	DATE	03/28/2018
CHECKED BY	SEK	PROJ. NO.	175664009
CHECKED BY		SCALE	NTS
REVISED			SHEET
1.	-	3.	-
2.	-	4.	-
			1 OF 1

DATA ACQUISITION
(DATA RECORDER OR
DATA LOGGER)

SURFACE PROTECTION
TO BE PROVIDED BY TVA

GROUND SURFACE

ELEV. 749.0'

NOTES:

1. INSTALLED ON 10/21/2017.
2. VIBRATING WIRE TRANSDUCERS ATTACHED TO OUTSIDE OF SACRIFICIAL 1" PVC CASING.
3. TRANSDUCERS SET IN FOUNDATION ASH, ALLUVIAL CLAY, AND ALLUVIAL SAND MATERIALS.

CEMENT-BENTONITE
GROUT

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702316

ELEV. 737.0'

VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702317

ELEV. 725.3'


VIBRATING WIRE
TRANSDUCER DGSI
MODEL NO. 52611024
S/N 1702320

ELEV. 703.0'

TOTAL DEPTH = 48.3'

DIA. 5 7/8"

PLOT DATE: 03/27/2018 USER: ELLISON, DOC V:\1756\ACTIVE\175664009\ENVIRONMENTAL\DRAWING\SHEET_FILES\KIF29\GEOTECH\INSTRUMENTS\SPT_17_03.DWG

SPT-17-03				
TVA KIF STILLING POND CLOSURE				
 <p>Stantec</p> <p>3052 Beaumont Centre Circle Lexington, Kentucky 40513 www.stantec.com</p>	DRAWN BY	RWE	DATE	03/28/2018
	CHECKED BY	SEK	PROJ. NO.	175664009
	CHECKED BY		SCALE	NTS
	REVISED		SHEET	
1.	-	3.	-	1 OF 1
2.	-	4.	-	

APPENDIX C.3

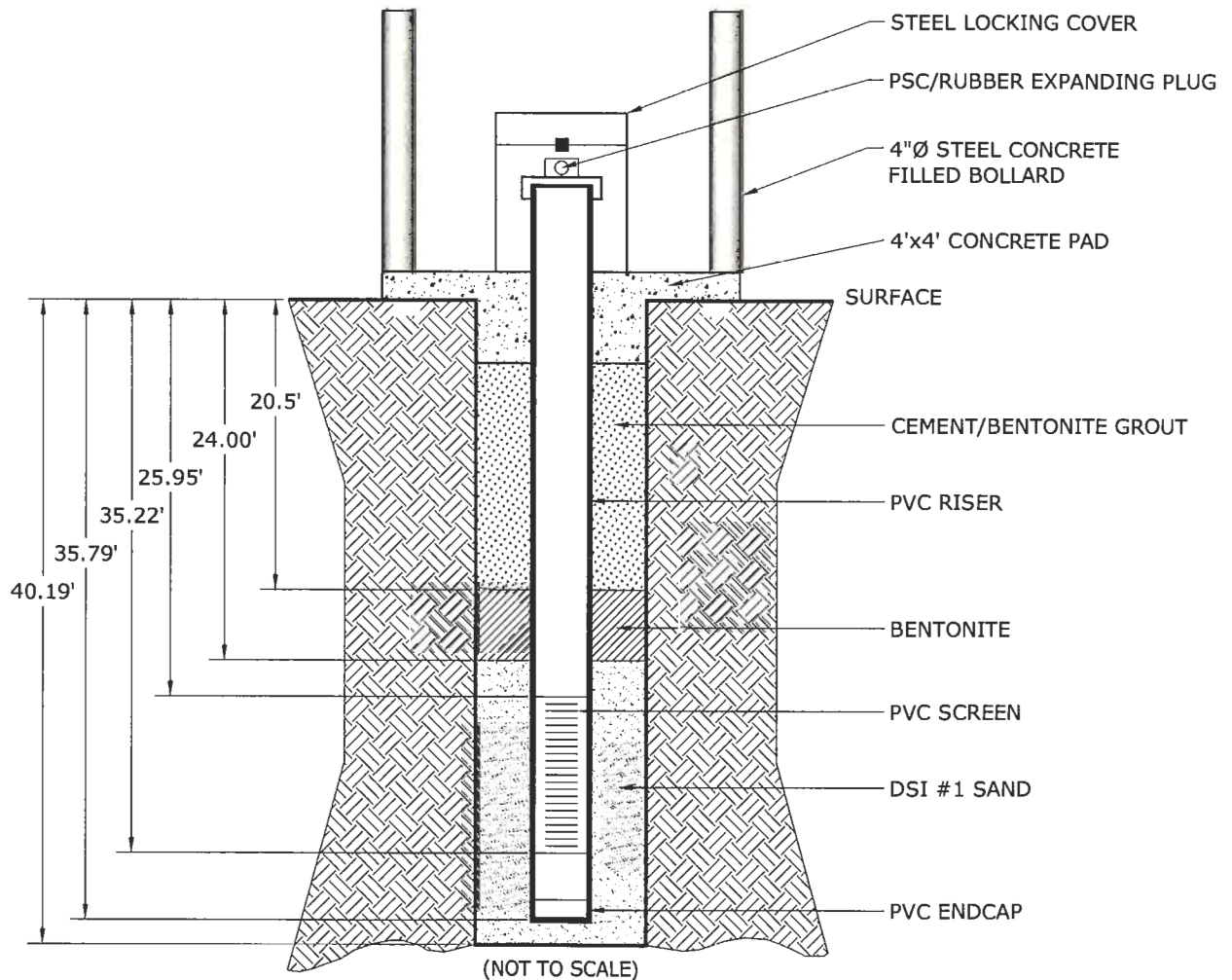
PERMANENT WELLS

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VB-02	25
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MONITORING WELL CONSTRUCTION DIAGRAM

JOB NAME <u> KIF MW6A INSTALLATION </u> WELL NUMBER <u> MW-6AR </u> TOTAL DEPTH <u> 40.19' </u> FIELD REPRESENTATIVE <u> N. SIREK / J. MASON </u>	JOB NUMBER <u> 3043-09-1029-01 </u> INSTALLATION DATE <u> 09/03/2009 </u> DRILLED BY <u> TRI-STATE DRILLING </u> RISER/SCREEN MATERIAL <u> SCHEDULE 40 PVC </u> DIAMETER <u> 2" </u> SLOT SIZE <u> 0.010" </u>
--	---



PREPARED BY: *RJS* DATE: 15 Oct 2009 CHECKED BY: *KJC* DATE: 15 Oct 2009

TENNESSEE VALLEY AUTHORITY
 1101 MARKET STREET, LP-2G
 CHATTANOOGA, TENNESSEE

MACTEC
 9725 Cogdill Road
 Knoxville, TN 37932
 Phone: 865-588-8544 Fax: 865-588-8026

TVA - KINGSTON
 MONITORING WELL INSTALLATION
 KINGSTON, TENNESSEE

PROJECT NO. 3043-09-1029

MONITORING WELL INSTALLATION RECORD

PROJECT Kingston Fossil Plant

WELL NUMBER KIF-22 INSTALLATION DATE July 10, 2002

TOP OF INNER CASING 756.2 ft-msl CASING MATERIAL PVC Sch 80

DRILLING TECHNIQUE Hollow-Stem Auger BOREHOLE DIAMETER 8 1/4 in.

DRILLED BY Lynn England LOGGED BY Jim Overton

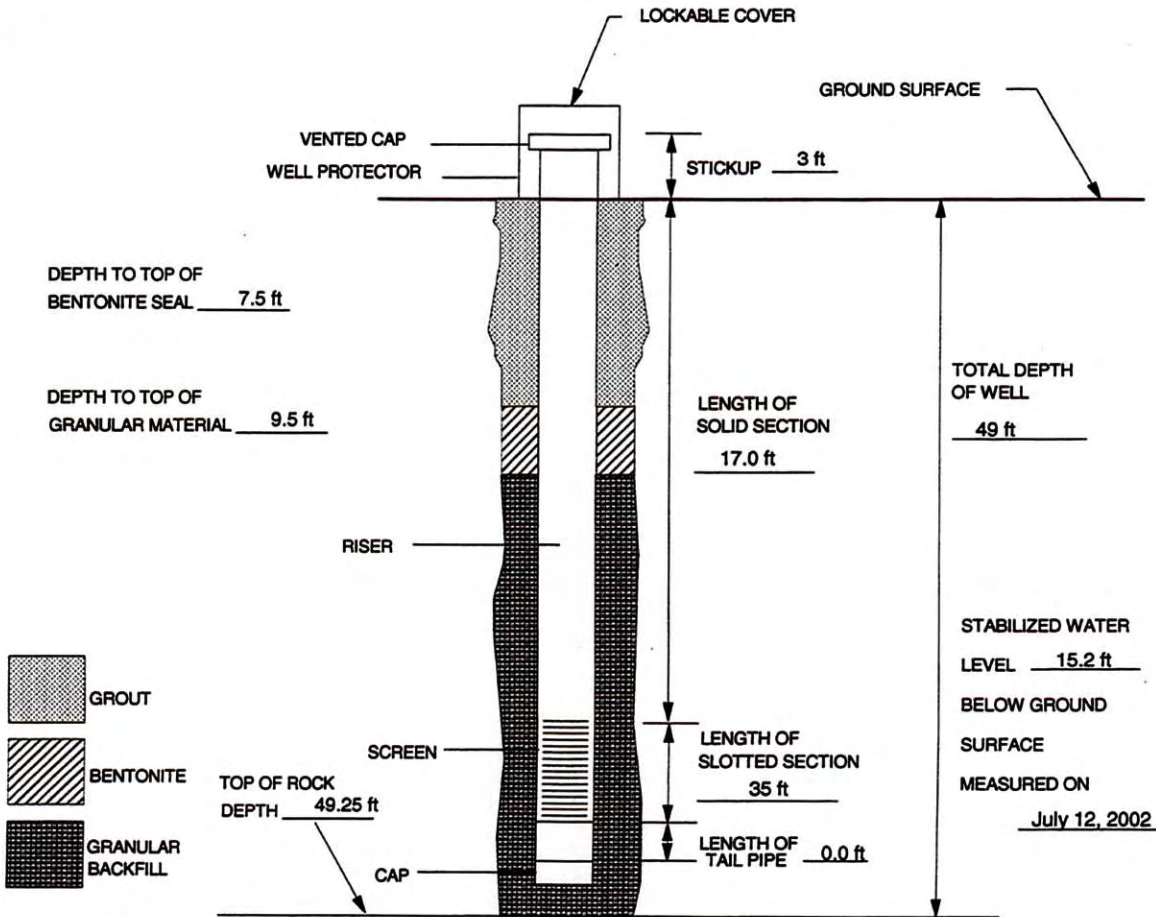
COMMENTS Filter sand was placed into the annulus from the bottom up with a sand injector.

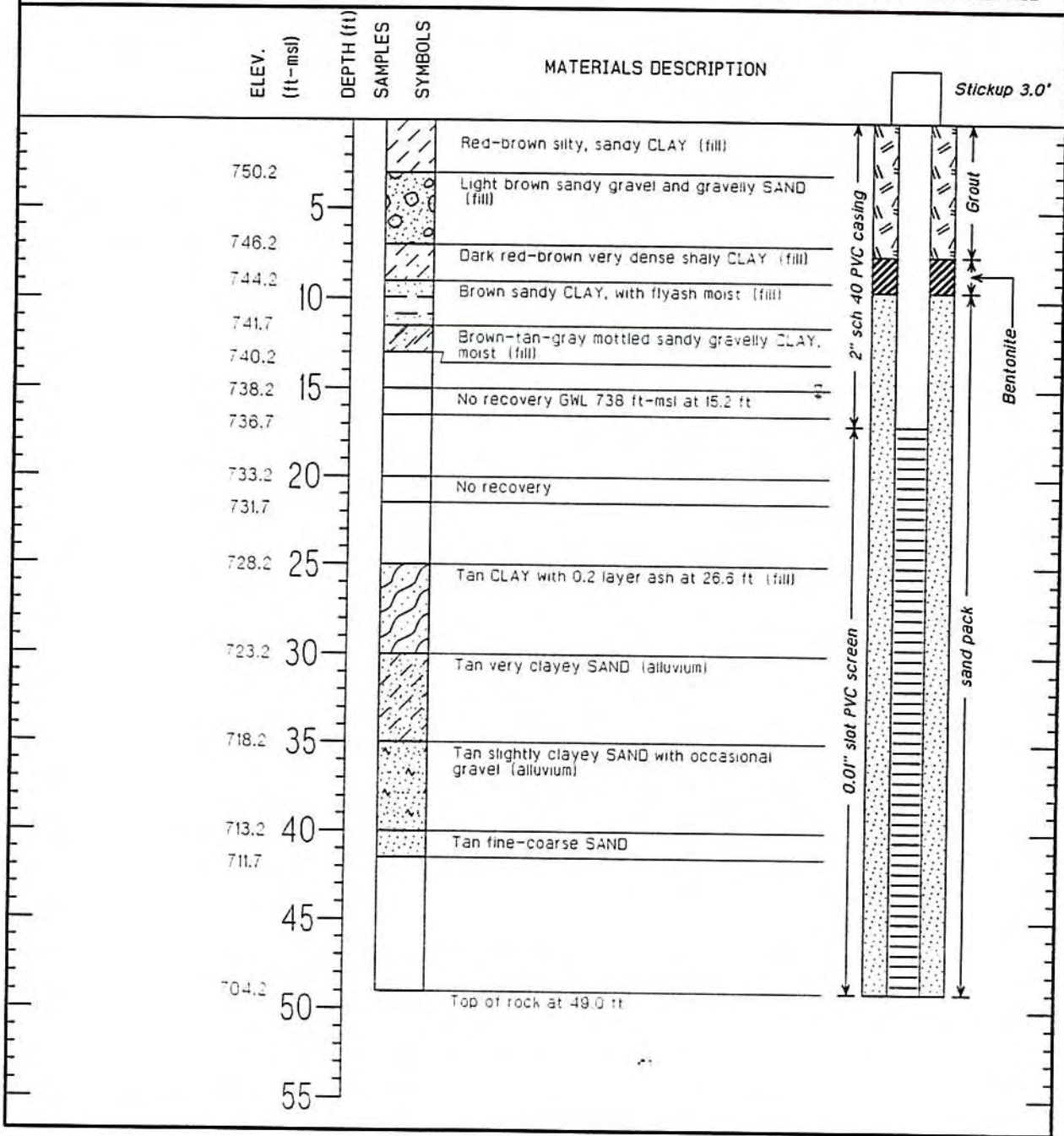
Soil descriptions were taken from split spoon sampler.

Well completed with 4 inch by 4 inch by 5 foot lockable steel well protector and a 4 foot diameter concrete pad.

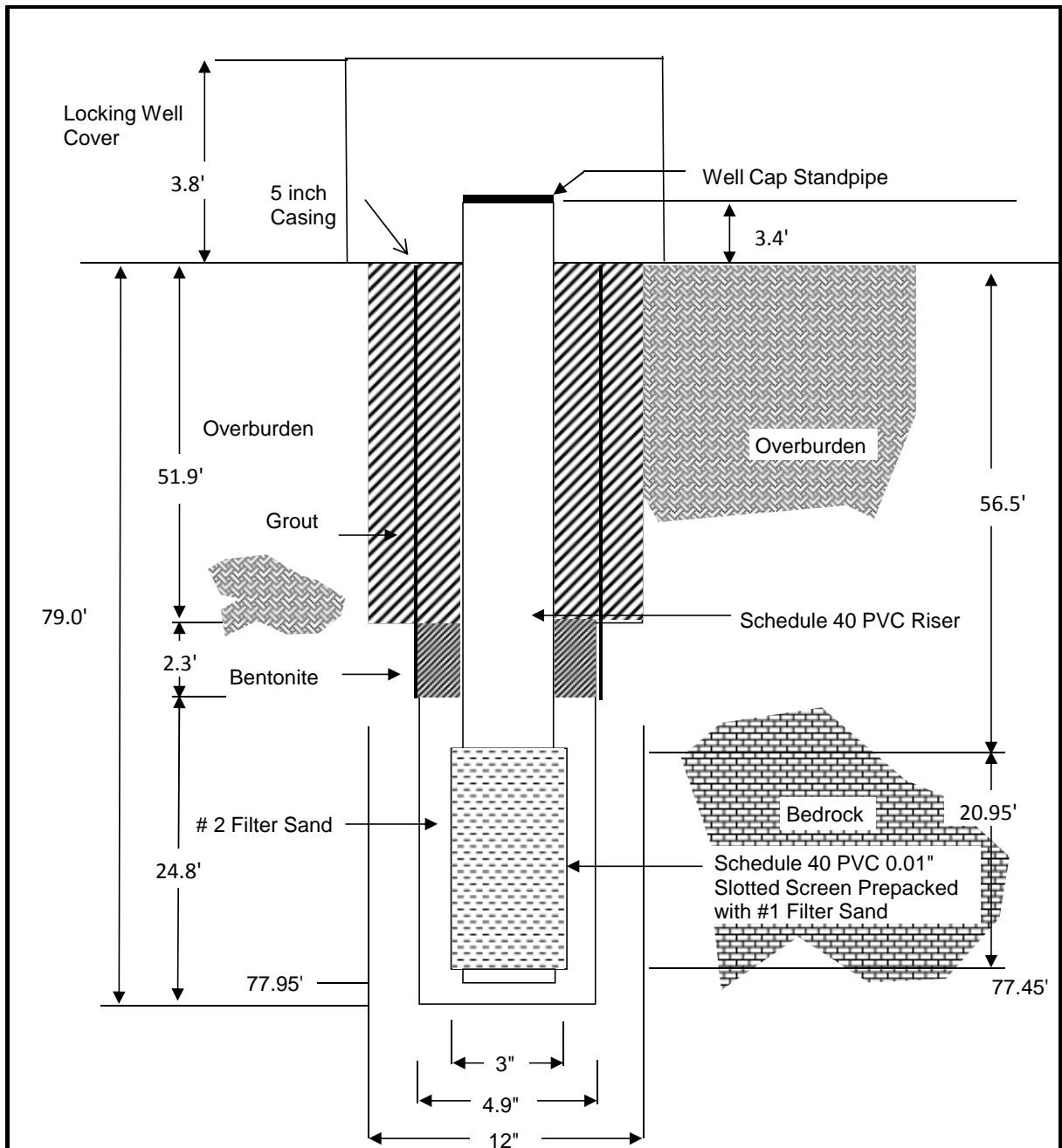
Four steel bollards were placed around the concrete pad.

(NOT TO SCALE)





PROJECT Kingston Fossil Plant DRILLING COMPANY TVA Field Engineering
 LOCATION Kingston, TN DATE DRILLED 07/10/02
 DRILL RIG Hollow Stem Auger SURFACE ELEVATION 753.2 ft-msl
 LOGGER/ENGINEER Jim Overton T.O.C. ELEVATION 756.2 ft-msl
 WATER LEVEL (INITIAL) 15.2 ft WATER LEVEL (24-HOUR) ft
 EAST 2442754.9 NORTH 555694.2



Date Constructed	<u>8/1/2014</u>	Top of Sand	<u>54.2 ft</u>
Boring Depth	<u>79.0 ft</u>	Top of Bentonite	<u>51.9 ft</u>
Casing	<u>5-inch</u>	Top of Grout	<u>Ground Surface (approx.)</u>
Total Well Depth	<u>77.95 ft</u>	Vol./Wt. of Sand	<u>2 ft³</u>
Length of Riser	<u>59.9 ft</u>	Vol./Wt. of Bentonite	<u>0.16 ft³</u>
Length of Screen	<u>20.95 ft</u>		

Well Construction Figure			
	Boring Number KIF-22B		
	Project Name: TVA Kingston Monitoring Wells		Project Number: 1431-11-121
	Scale : NTS	Drawn By: JDF	Checked By: CTJ
	Date: 8/1/2014		

PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121				BORING LOG: KIF-22B											
DATE DRILLED: 7/31/14		ELEVATION: Not Recorded		NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.											
DRILLING METHOD: 6-5/8" H.S.A / PQ3		BORING DEPTH: 79 feet													
LOGGED BY: J. Feuge		WATER LEVEL @ TOB: 15 feet													
DRILLER: H. Herd		WATER LEVEL @ 24 hrs: Not Recorded													
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE	
							5	15	30	1st	2nd	3rd	4th		
		Crushed Stone Aggregate (2-inch diameter minus)													
		No. 10 Screenings Aggregate													
5		FAT CLAY (CH) - With black nodules; dark red; slightly moist - FILL													
		LEAN CLAY (CL) - With tan weathered shale fragments, red fat clay, and trace bottom ash; orange and tan; slightly moist; firm to hard - FILL													
10		BOTTOM ASH - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL													

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121					BORING LOG: KIF-22B								
DATE DRILLED: 7/31/14			ELEVATION: Not Recorded			NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.							
DRILLING METHOD: 6-5/8" H.S.A / PQ3			BORING DEPTH: 79 feet										
LOGGED BY: J. Feuge			WATER LEVEL @ TOB: 15 feet										
DRILLER: H. Herd			WATER LEVEL @ 24 hrs: Not Recorded										
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE
						5	15	30	1st	2nd	3rd	4th	
15		BOTTOM ASH - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL (<i>continued</i>)	▽						1	5	4	5	9
									4	4	5	5	9
									3	3	4	3	7
20									3	1	1	0	2
									0	0	2	2	2
								3	4	0	1	4	

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
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PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121					BORING LOG: KIF-22B										
DATE DRILLED: 7/31/14			ELEVATION: Not Recorded			NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.									
DRILLING METHOD: 6-5/8" H.S.A / PQ3			BORING DEPTH: 79 feet												
LOGGED BY: J. Feuge			WATER LEVEL @ TOB: 15 feet												
DRILLER: H. Herd			WATER LEVEL @ 24 hrs: Not Recorded												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE	
							5	15	30	1st	2nd	3rd	4th		
		BOTTOM ASH - With some fine sand and sandy lean clay intervals; slightly moist to wet; very loose to loose - FILL (continued)													
		LEAN CLAY WITH SAND (CL) - Tan and brown; very moist to wet; very soft to firm - ALLUVIUM													
30															
		SILTY SAND (SM) - Orange brown; wet; very loose - ALLUVIUM													
35															

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121				BORING LOG: KIF-22B										
DATE DRILLED: 7/31/14		ELEVATION: Not Recorded			NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.									
DRILLING METHOD: 6-5/8" H.S.A / PQ3		BORING DEPTH: 79 feet												
LOGGED BY: J. Feuge		WATER LEVEL @ TOB: 15 feet												
DRILLER: H. Herd		WATER LEVEL @ 24 hrs: Not Recorded												
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE
							5	15	30	1st	2nd	3rd	4th	
40		POORLY GRADED SAND (SP) - With occasional gravel; orange brown and tan; wet; very loose to very dense - ALLUVIUM												
										1	1	0	0	1
										1	1	3	4	4
										0	1	1	1	2
										1	2	3	3	5
45									1	3	5	7	8	
									>>	14	34	50/4"		50/4"

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121					BORING LOG: KIF-22B									
DATE DRILLED: 7/31/14			ELEVATION: Not Recorded			NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.								
DRILLING METHOD: 6-5/8" H.S.A / PQ3			BORING DEPTH: 79 feet											
LOGGED BY: J. Feuge			WATER LEVEL @ TOB: 15 feet											
DRILLER: H. Herd			WATER LEVEL @ 24 hrs: Not Recorded											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE
							5	15	30	1st	2nd	3rd	4th	
		WEATHERED SILTSTONE / SHALE - Tan, brown, to gray; slightly moist; very hard - RESIDUUM (continued)								8	27	39	16	66
		Began PQ3 coring at a depth of 54.2 feet.												
55		Run No. 1 (54.2' to 56.4') Siltstone - Dark gray; fine grained; friable; near vertical bedding; soft; highly fractured.			1	REC 73% RQD 0%								
		Run No. 2 (56.4' to 58.4') Siltstone - With interbedded limestone from 58.0 to 58.4 feet; dark gray; fine grained; friable; slightly weathered; bedding is at an apparent dip of 45 degrees; siltstone is soft to medium hard; limestone is hard.			2	REC 90% RQD 0%								
60		Run No. 3 (58.4' to 61.1') Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; moderately weathered seams at 58.7, 58.9, and 59.3 feet; calcite-healed features throughout; bedding is at an apparent dip of 45 degrees.			3	REC 100% RQD 0%								
					4	REC								
														50/3"

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121	BORING LOG: KIF-22B
--	----------------------------

DATE DRILLED: 7/31/14	ELEVATION: Not Recorded	NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.
DRILLING METHOD: 6-5/8" H.S.A / PQ3	BORING DEPTH: 79 feet	
LOGGED BY: J. Feuge	WATER LEVEL @ TOB: 15 feet	
DRILLER: H. Herd	WATER LEVEL @ 24 hrs: Not Recorded	

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE
							5	15	30	1st	2nd	3rd	4th	
		Run No. 4 (61.1' to 63.8') Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			100% REC 0% RQD									
65		Run No. 5 (63.8' to 66.4') From 63.8 to 64.7 feet - Siltstone with interbedded Limestone - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees. From 64.7 to 66.4 feet - Siltstone with interbedded Shale and Limestone - Dark gray; very fine grained; medium hard; slightly weathered; with calcite healed veins throughout; highly fractured; limestone interval observed from 65.9 to 66.2 feet.			5 REC 92% RQD 0%									
		Run No. 6 (66.4' to 68.2') From 66.4 to 66.9 feet - Limestone. From 66.9 to 68.2 feet Siltstone with interbedded Shale - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			6 REC 94% RQD 0%									
70		Run No. 7 (68.2' to 70.4') Siltstone with interbedded Shale - Greenish gray and gray; fine grained; medium hard; slightly weathered; calcite-healed features throughout; moderately to highly fractured; bedding is at an apparent dip of 35 degrees.			7 REC 100% RQD 0%									
		Run No. 8 (70.4' to 70.9') Siltstone with interbedded Shale - Same lithology as previous run.			8 REC 100% RQD 0%									
		Run No. 9 (70.9' to 74.2') Siltstone with interbedded Shale - Same lithology as previous run.			9 REC 85% RQD 0%									
		Run No. 10 (74.2' to 76.4') Siltstone with interbedded Shale - Same lithology as previous run.												

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

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2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



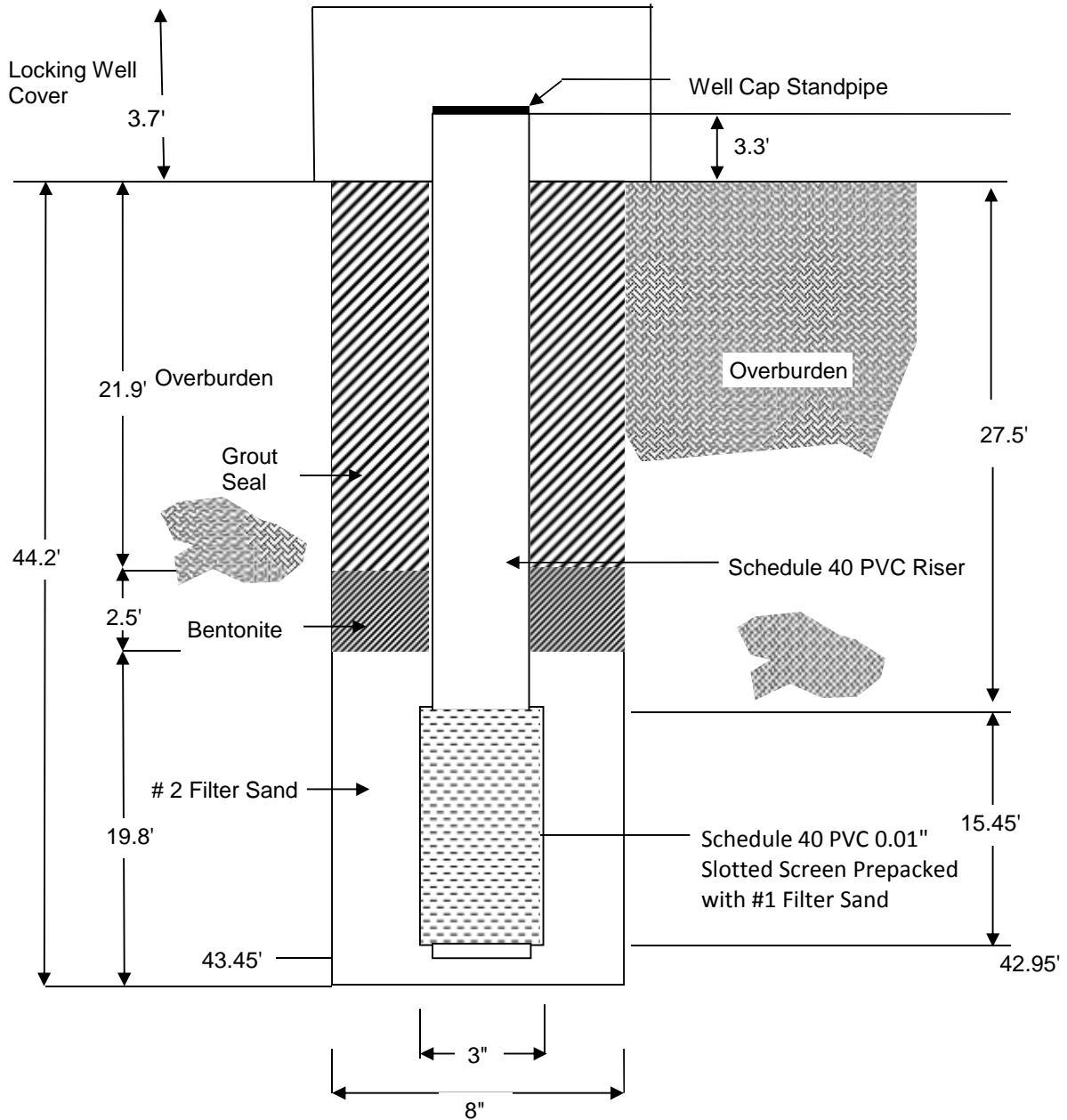
PROJECT: TVA KIF - Monitoring Well Installation Kingston, TN S&ME Project No. 1431-11-121					BORING LOG: KIF-22B									
DATE DRILLED: 7/31/14			ELEVATION: Not Recorded			NOTES: Soil and bedrock descriptions based upon visual observation of obtained samples. Boring was advanced with 6-5/8-inch hollow stem augers to auger refusal. Bedrock was cored utilizing PQ3 coring techniques.								
DRILLING METHOD: 6-5/8" H.S.A / PQ3			BORING DEPTH: 79 feet											
LOGGED BY: J. Feuge			WATER LEVEL @ TOB: 15 feet											
DRILLER: H. Herd			WATER LEVEL @ 24 hrs: Not Recorded											
DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO. SAMPLE TYPE	STANDARD PENETRATION TEST (SPT) DATA (blows/ft)			SPT INTERVALS (blows/6 inches)				N VALUE	
						5	15	30	1st	2nd	3rd	4th		
		Run No. 10 (74.2' to 76.4') Siltstone with interbedded Shale - Same lithology as previous run. <i>(continued)</i>			10 REC 114% RQD 18%									
		Run No. 11 (76.4' to 77.3') Siltstone with interbedded Shale - Same lithology as previous run.			11 REC 100% RQD 0%									
		Run No. 12 (77.3' to 79.0') Siltstone with interbedded Shale - Same lithology as previous run.			12 REC 82% RQD 0%									
		PQ3 Coring Terminated at 79.0 feet.												

BORING LOG - TVA 11-121 MW.GPJ 8/13/14

NOTES:

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



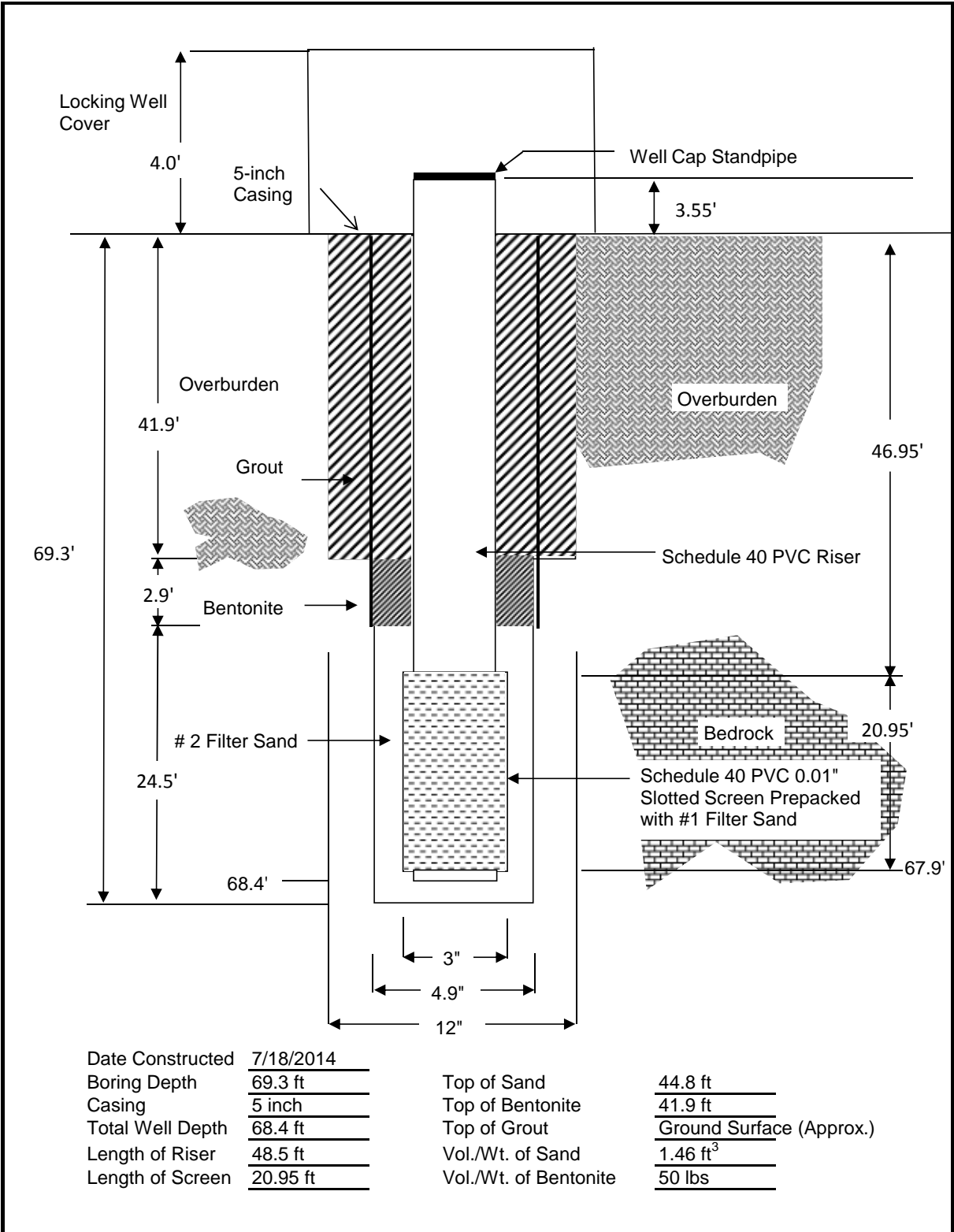


Date Constructed	<u>7/22/2014</u>	Top of Sand	<u>24.4 ft</u>
Boring Depth	<u>44.2 ft</u>	Top of Bentonite	<u>21.9 ft</u>
Casing	<u>N/A</u>	Top of Grout	<u>Ground Surface (Approx.)</u>
Total Well Depth	<u>43.45 ft</u>	Vol./Wt. of Sand	<u>0.4 ft³</u>
Length of Riser	<u>30.8 ft</u>	Vol./Wt. of Bentonite	<u>30 lbs</u>
Length of Screen	<u>15.45 ft</u>		

Well Construction Figure



Boring Number KIF-27A		
Project Name: TVA Kingston Monitoring Wells	Project Number: 1431-11-121	
Scale : NTS	Drawn By: JDF	Checked By: CTJ
Date: 8/29/2014		



Well Construction Figure



Boring Number KIF-27B

Project Name: TVA Kingston Monitoring Wells

Project Number: 1431-11-121

Scale: NTS

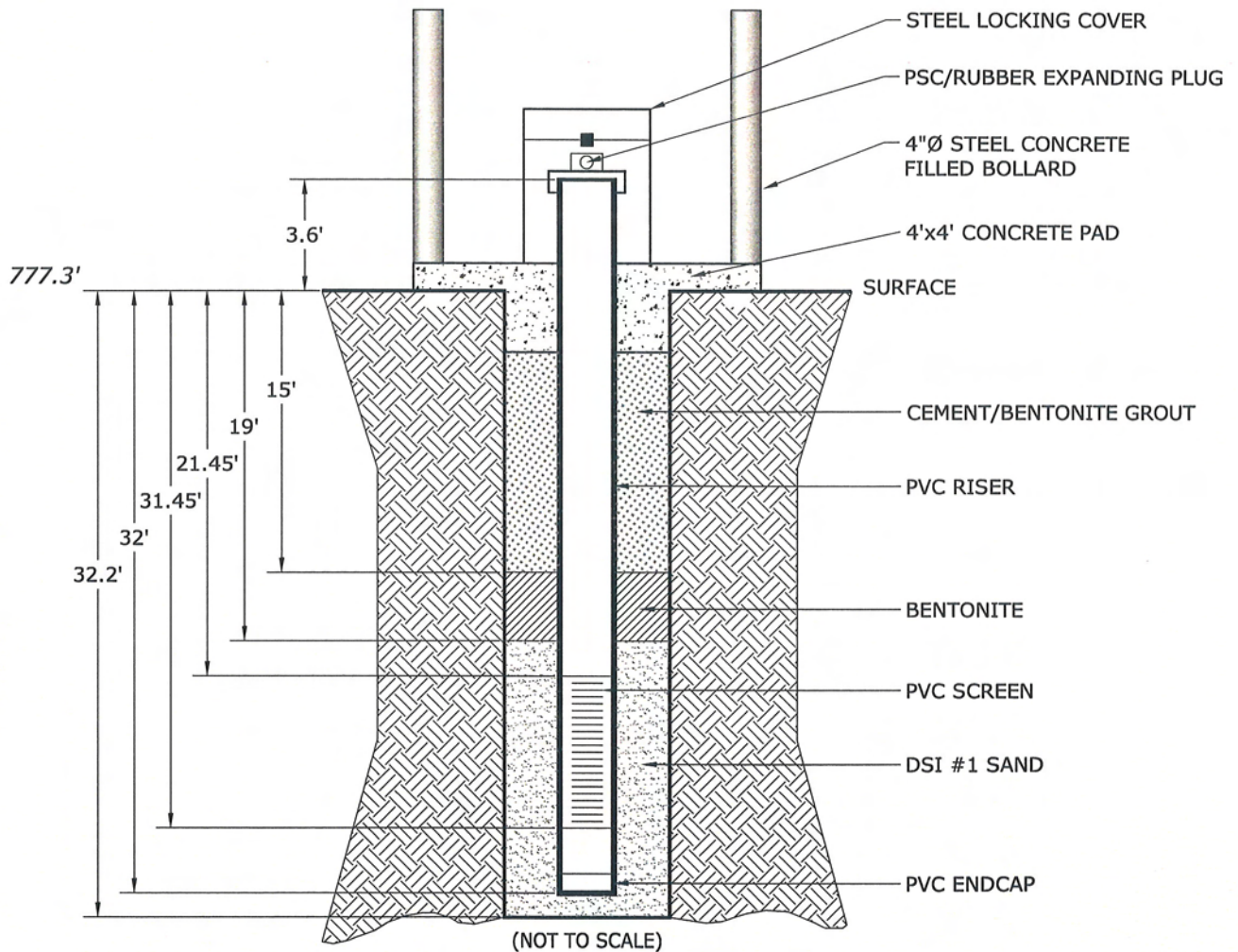
Drawn By: JDF

Checked By: CTJ

Date: 8/1/2014

MONITORING WELL CONSTRUCTION DIAGRAM

JOB NAME <u>TVA KINGSTON</u> WELL NUMBER <u>MW-AD-1</u> TOTAL DEPTH <u>32.2</u> FIELD REPRESENTATIVE <u>NICK SMITH</u>	JOB NUMBER <u>3043-09-1015-01</u> INSTALLATION DATE <u>05/05/2009</u> DRILLED BY <u>TRI-STATE DRILLING</u> RISER/SCREEN MATERIAL <u>SCHEDULE 40 PVC</u> DIAMETER <u>2"</u> SLOT SIZE <u>0.010"</u>
---	---



PREPARED BY: *RSS* DATE: 20 Jul 2009 CHECKED BY: *K.S.C.* DATE: 20 Jul 2009

TENNESSEE VALLEY AUTHORITY
 1101 MARKET STREET, LP-2G
 CHATTANOOGA, TENNESSEE

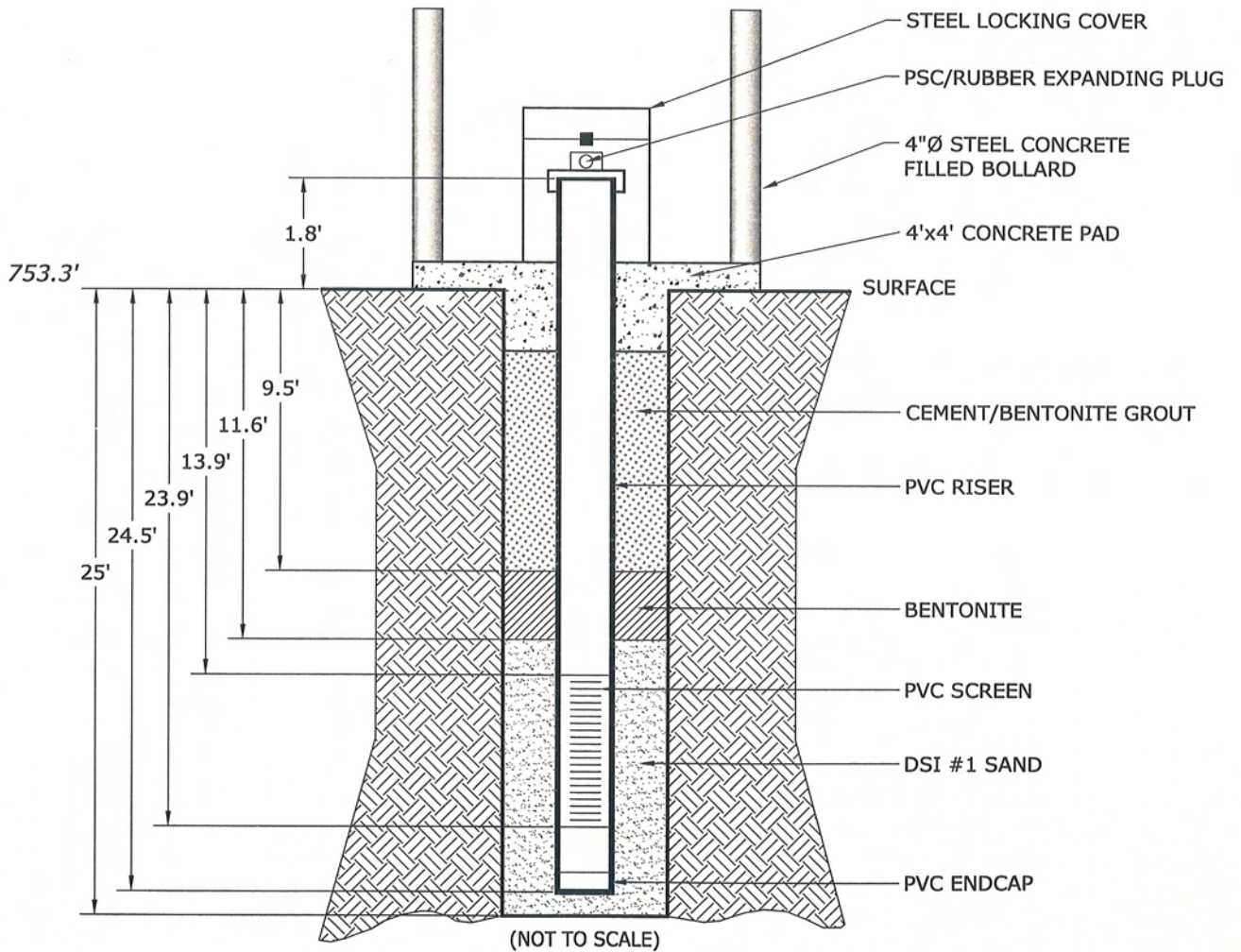
MACTEC
 9725 Cogdill Road
 Knoxville, TN 37932
 Phone: 865-588-8544 Fax: 865-588-8026

TVA - KINGSTON
 MONITORING WELL INSTALLATION
 KINGSTON, TENNESSEE

PROJECT NO. 3043-09-1015

MONITORING WELL CONSTRUCTION DIAGRAM

JOB NAME <u>TVA KINGSTON</u> WELL NUMBER <u>MW-AD-2</u> TOTAL DEPTH <u>25.0</u> FIELD REPRESENTATIVE <u>NICK SMITH</u>	JOB NUMBER <u>3043-09-1015-01</u> INSTALLATION DATE <u>03/18/2009</u> DRILLED BY <u>TRI-STATE DRILLING</u> RISER/SCREEN MATERIAL <u>SCHEDULE 40 PVC</u> DIAMETER <u>2"</u> SLOT SIZE <u>0.010"</u>
---	---



PREPARED BY: *RJS* DATE: 20 Jul 2009 CHECKED BY: *K.S.C.* DATE: 20 Jul 2009

TENNESSEE VALLEY AUTHORITY
 1101 MARKET STREET, LP-2G
 CHATTANOOGA, TENNESSEE

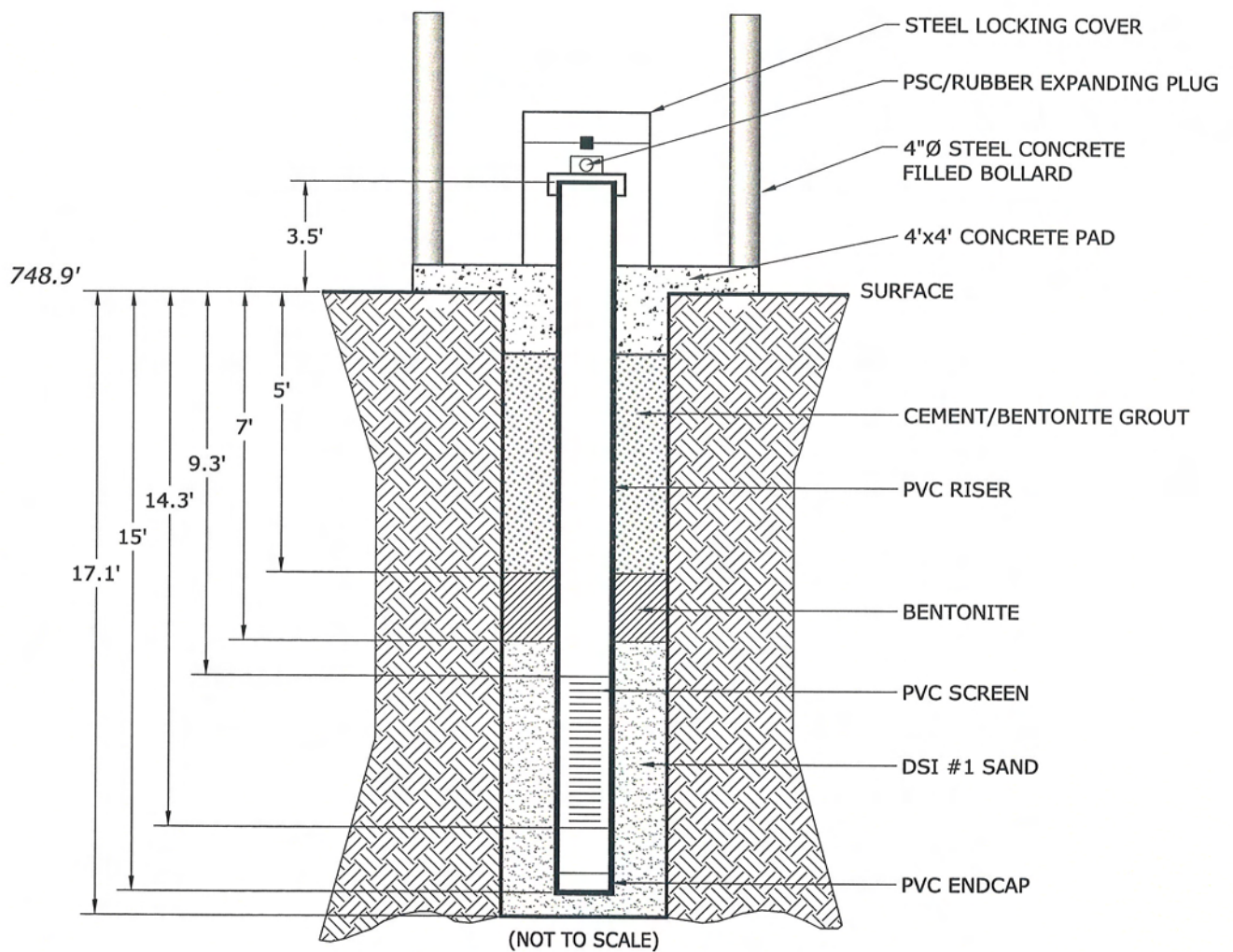
MACTEC
 9725 Cogdill Road
 Knoxville, TN 37932
 Phone: 865-588-8544 Fax: 865-588-8026

TVA - KINGSTON
 MONITORING WELL INSTALLATION
 KINGSTON, TENNESSEE

PROJECT NO. 3043-09-1015

MONITORING WELL CONSTRUCTION DIAGRAM

JOB NAME <u>TVA KINGSTON</u> WELL NUMBER <u>MW-AD-3</u> TOTAL DEPTH <u>17.1</u> FIELD REPRESENTATIVE <u>NICK SMITH</u>	JOB NUMBER <u>3043-09-1015-01</u> INSTALLATION DATE <u>04/03/2009</u> DRILLED BY <u>TRI-STATE DRILLING</u> RISER/SCREEN MATERIAL <u>SCHEDULE 40 PVC</u> DIAMETER <u>2"</u> SLOT SIZE <u>0.010"</u>
---	---



PREPARED BY: *RJS* DATE: 20 Jul 2009 CHECKED BY: *K.S.C.* DATE: 20 Jul 2009

TENNESSEE VALLEY AUTHORITY
 1101 MARKET STREET, LP-2G
 CHATTANOOGA, TENNESSEE

MACTEC
 9725 Cogdill Road
 Knoxville, TN 37932
 Phone: 865-588-8544 Fax: 865-588-8026

TVA - KINGSTON
 MONITORING WELL INSTALLATION
 KINGSTON, TENNESSEE

PROJECT NO. 3043-09-1015

MONITORING WELL INSTALLATION FIELD LOG

CLIENT: Tennessee Valley Authority	FACILITY ID: Kingston Fossil Plant / KIF	WELL NO.: GW-02
GEOLOGIST: R. Josefczyk & R. Lee	DRILLING METHOD: Hollow Stem Auger	LOCATION/COORDINATES: 2439721.211E, 557337.716N
WEATHER: Partly Cloudy TEMPERATURE: 95° F	DRILLING COMPANY: Tri-State Drilling, Chattanooga, TN	DATE/TIME 080910 082310
DRILLER(s): G. Akins	DRILL RIG(s): CME 55	STARTED: 1014 COMPLETED: 1600

LITHOLOGIC DESCRIPTION*	ELEVATION/ DEPTH	PID(ppm)	BLOWS/ft.	WELL CONSTRUCTION	MATERIALS INVENTORY
				Depth (feet BGS) Details	
	0				BENTONITE SEAL: TOP: 5.5 Ft. BGS BOTTOM: 7.5 Ft. BGS
GRAVEL(Fill) 0.0' - 2.4' BGS					FILTER PACK GRAINSIZE: #2 Sand
SILTY CLAY 2.4' - 13.0' BGS	5				FILTER PACK: TOP: 7.5 Ft. BGS BOTTOM: 20.0 Ft. BGS
	10				GROUT QUANTITY: Approximately 5 Gallons
CLAY with Minor SILT 13.0' - 14.1' BGS					GROUT: TOP: 0.0 Ft. BOTTOM: 5.5 Ft. BGS
	15				GROUT TYPE: 5% Bentonite Cement by Weight
CLAY with WEATHERED SHALE 14.1' - 20.0' BGS					SCREEN TYPE: Sch. 40 PVC
	20				WELL SCREEN: Inches In Diameter: 2" Linear Feet: 10.0'
				5.5' 7.5' 9.5'	SLOT SIZE: 10 Slot
				19.5' 20.0'	WELL CASING: Inches In Diameter: 2" Linear Feet: 10.0' To Ground Surface
				End Plug Terminus of Borehole	CASING TYPE: Sch. 40 PVC
					TOP OF CASING (AGS): 3.247 Ft.
					BOREHOLE (In. DIAMETER): 8"
					BOTTOM OF BOREHOLE (FT BGS): 20.0 Ft.
					ELEVATION (FT ABOVE MSL): 766.543 Ft.
*For Further Lithology Detail, See Attached Boring Log				Diagram Not To Scale	



MONITORING WELL INSTALLATION FIELD LOG

FACILITY NAME: KINGSTON FOSSIL PLANT	FACILITY ID:	WELL NO.: MW-22C
ENGINEER: S&ME / N.PETERSON	DRILLING METHOD: SONIC	LOCATION/COORDINATES: N: 577060.67 E: 2411240.29 (TN STATE PLANE)
WEATHER: CLOUDY	DRILLING COMPANY: CASCADE	DATE/TIME
TEMPERATURE: 55° F	DRILL RIG: SONIC	DRILLER: T. TAYLOR
		STARTED: 11/7/17 COMPLETED: 1/30/18 (SEE NOTE 1)

LITHOLOGIC DESCRIPTION	ELEVATION/DEPTH	PID (ppm)	BLOWS/ft.	WELL CONSTRUCTION	MATERIALS INVENTORY
				Depth (feet BGS) Details 	
				761.9'	BENTONITE SEAL: TOP: 28.0 FT BGS BOTTOM: 32.0 FT BGS
				761.2' 756.8'	FILTER PACK GRAINSIZE: GLOBAL #7 (20-40 MESH)
CRUSHED STONE	755.5/0.0			CONCRETE PAD (SEE NOTES 2,3)	FILTER PACK: TOP: 32.0 FT BGS BOTTOM: 48.5 FT BGS
CLAY, DARK REDDISH BROWN, MOIST (FILL)	752.5/3.0			8 X 8 Inch Protective Outer Casing (SEE NOTES 3,4)	GROUT QUANTITY: 69 US GALLONS
CLAY, DARK GREY AND DARK REDDISH BROWN, MOIST, SOME BOTTOM ASH AND FLY ASH (FILL)	747.5/8.0			Drain Hole (SEE NOTE 5)	GROUT: TOP: 2.0 FT BGS BOTTOM: 28.0 FT BGS
CLAY, YELLOWISH BROWN, MOIST (ALLUVIUM)	745.5/10.0			4 Inch Sch. 40 PVC Riser	GROUT TYPE: HIGH SOLIDS (30%) BENTONITE
CLAY, YELLOWISH BROWN, MOIST (ALLUVIUM)	738.0/17.5			4 Inch Sch. 40 PVC U-PACK SCREEN	SCREEN TYPE: SCH. 40 PVC
SAND, LIGHT OLIVE BROWN, WET (ALLUVIUM)	736.0/19.5			0.010" Slot Well Screen	WELL SCREEN: in. I.f. 4" X 5" U-PACK 10.0 FT
CLAY, YELLOWISH BROWN, MOIST (ALLUVIUM)	729.5/26.0				SLOT SIZE: 0.010 INCHES
CLAYEY SAND, YELLOWISH BROWN, WET (ALLUVIUM)	725.5/30.0				WELL CASING: Inches in Diameter I.f. 4 INCHES 39.7 FT
SAND, YELLOWISH BROWN, WET (ALLUVIUM)	719.5/36.0				CASING TYPE: SCH. 40 PVC
SAND WITH COBBLE, YELLOWISH BROWN, WET (ALLUVIUM)	707.0/48.5				TOP OF CASING (AGS): 5.7 FT
WEATHERED SHALE	704.0/51.5				BOREHOLE (IN. DIAMETER): 10 INCHES (0'-15'); 9 INCHES (15'-51.5')
BOTTOM OF BORING / NO REFUSAL					BOTTOM OF BOREHOLE (FT BGS): 51.5 FT
					TOP OF CASING ELEVATION (FT ABOVE MSL): N/A

- NOTES:
1. COMPLETION DATE INCLUDES INSTALLATION OF THE CONCRETE PAD, PROTECTIVE BOLLARDS, AND WELL DEVELOPMENT
 2. 4'X4'X12" THICK CONCRETE PAD WITH 4 BOLLARDS SET 2' BGS IN CONCRETE
 3. PRECAST CONCRETE PAD INSTALLED, WITH PROTECTIVE COVER BOLTED TO THE TOP OF THE PAD.
 4. ANNULUS BETWEEN PVC CASING AND PROTECTIVE COVER BACKFILLED WITH PEA GRAVEL
 5. DRAIN HOLE INSTALLED ON TWO SIDES OF PROTECTIVE COVER

CAVE IN (SLOUGH)	COARSE SAND	FINE FILTER SAND	BENTONITE GROUT	CEMENT PAD	BENTONITE SEAL (PELLETS)
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TVA



WELL INSTALLATION DETAIL

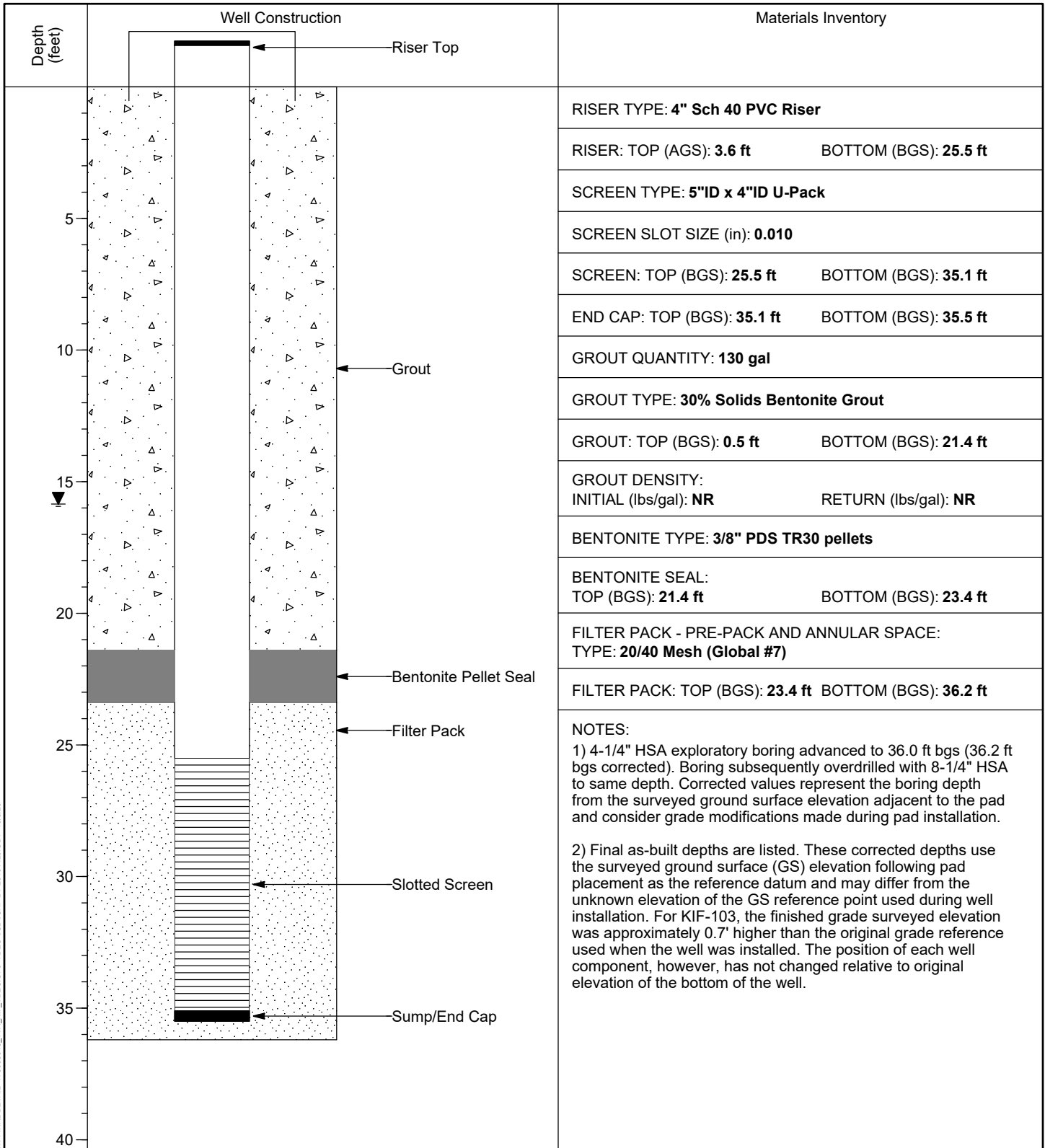
WELL / PROBEHOLE / BOREHOLE NO:

PAGE 1 OF 1

KIF-103 (Boring KIF-103)

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec Consulting Services Inc.**
 DRILLING EQUIPMENT: **CME 850 Track**
 DRILLING METHOD: **8-1/4" HSA overdrill of boring**
 SAMPLING METHOD: **4-1/4" HSA, 2" SS w/o liners**
 OBSERVED BY: **G. Budd**
 REVIEWED BY: **C. Kocka**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **10/2/18** COMPLETED: **10/3/18**
 LOCATION: **575,021.43 N; 2,410,351.42 E** DATUM: **NAD83**
 LOC. DESCRIP:
 LATITUDE: **35° 54' 13.63"** LONGITUDE: **-84° 30' 28.75"**
 GROUND ELEV (ft): **756.7** TOC ELEV (ft): **760.33**
 ELEVATION DATUM: **NGVD29**
 WELL DEPTH (ft, bgs): **35.5**
 DTW AT COMPLETION (ft, bgs): **15.9**
 BOREHOLE DIA. (in): **13.0** WELL DIA. (in): **4.0**



MW/FINAL DETAIL: 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF.DT 20191120.GDT 10/8/20

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

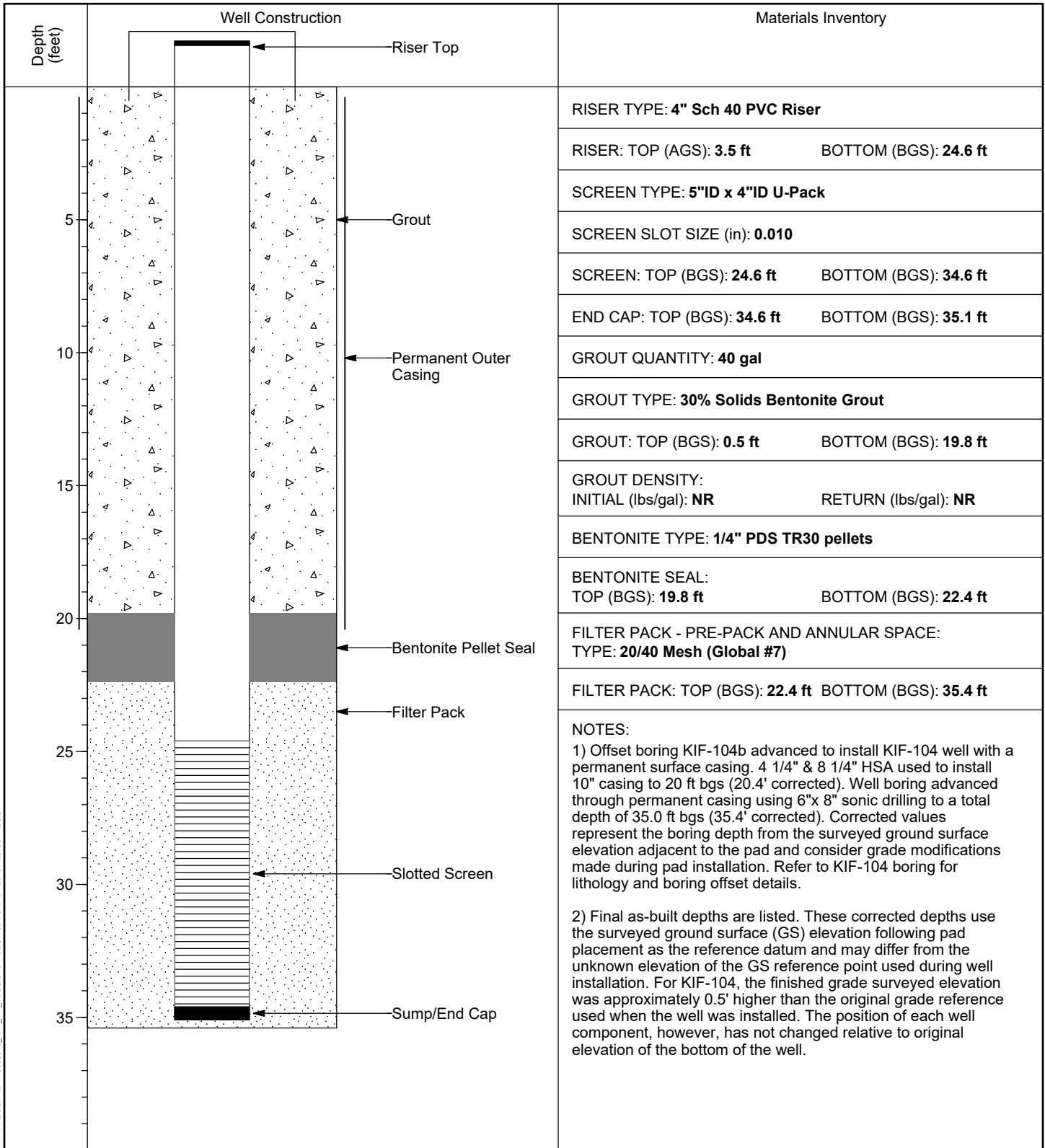


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: **KIF-104 (Boring KIF-104b)** PAGE 1 OF 1

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec / M&W Drilling**
 DRILLING EQUIPMENT: **CME 850XR #853/Geoprobe 8150LS Sonic**
 DRILLING METHOD: **4-1/4" & 8-1/4" HSA to 20'; 6"x8" Sonic to depth**
 SAMPLING METHOD: **4-1/4" & 8-1/4" HSA to 20'; 6"x8" Sonic to depth**
 OBSERVED BY: **B. Evans**
 REVIEWED BY: **C. Kocka**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **10/30/18** COMPLETED: **10/30/18**
 LOCATION: **575,765.61 N; 2,411,402.90 E** DATUM: **NAD83**
 LOC. DESCRIP: **Stilling Pond**
 LATITUDE: **35° 54' 20.83"** LONGITUDE: **-84° 30' 15.83"**
 GROUND ELEV (ft): **755.1** TOC ELEV (ft): **758.60**
 ELEVATION DATUM: **NGVD29**
 WELL DEPTH (ft, bgs): **35.1**
 DTW AT COMPLETION (ft, bgs): **N/A**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



MW/FINAL DETAIL: 175668043_TVA_KIF_TDEC.GPJ TDEC SUBSURF.DT 20191120.GDT 2/5/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

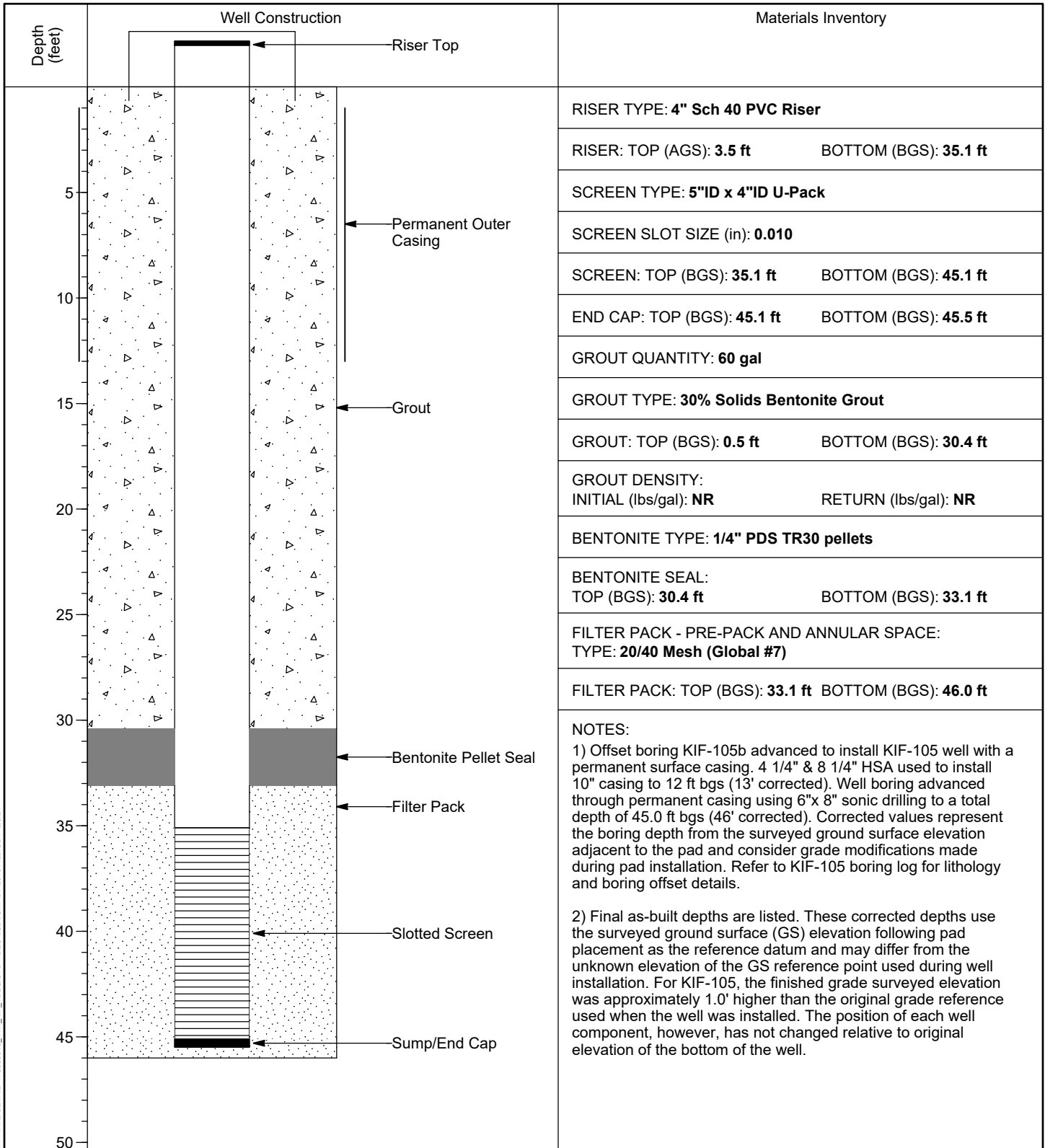


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: **KIF-105 (Boring KIF-105b)** PAGE 1 OF 1

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec / M&W Drilling**
 DRILLING EQUIPMENT: **CME 850XR #853/Geoprobe 8150LS Sonic**
 DRILLING METHOD: **4-1/4" & 8-1/4" HSA to 12'; 6"x8" Sonic to depth**
 SAMPLING METHOD: **4-1/4" & 8-1/4" HSA to 12'; 6"x8" Sonic to depth**
 OBSERVED BY: **B. Evans**
 REVIEWED BY: **C. Kocka**
 APPROVED BY: **P. Dunne**

INSTALLATION: STARTED: **10/30/18** COMPLETED: **10/31/18**
 LOCATION: **574,819.38 N; 2,408,462.83 E** DATUM: **NAD83**
 LOC. DESCRIP: **Sluice Trench**
 LATITUDE: **35° 54' 11.92"** LONGITUDE: **-84° 30' 51.74"**
 GROUND ELEV (ft): **753.0** TOC ELEV (ft): **756.56**
 ELEVATION DATUM: **NGVD29**
 WELL DEPTH (ft, bgs): **45.5**
 DTW AT COMPLETION (ft, bgs): **N/A**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



MW FINAL DETAIL 175668043 TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20191120.GDT 2/5/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

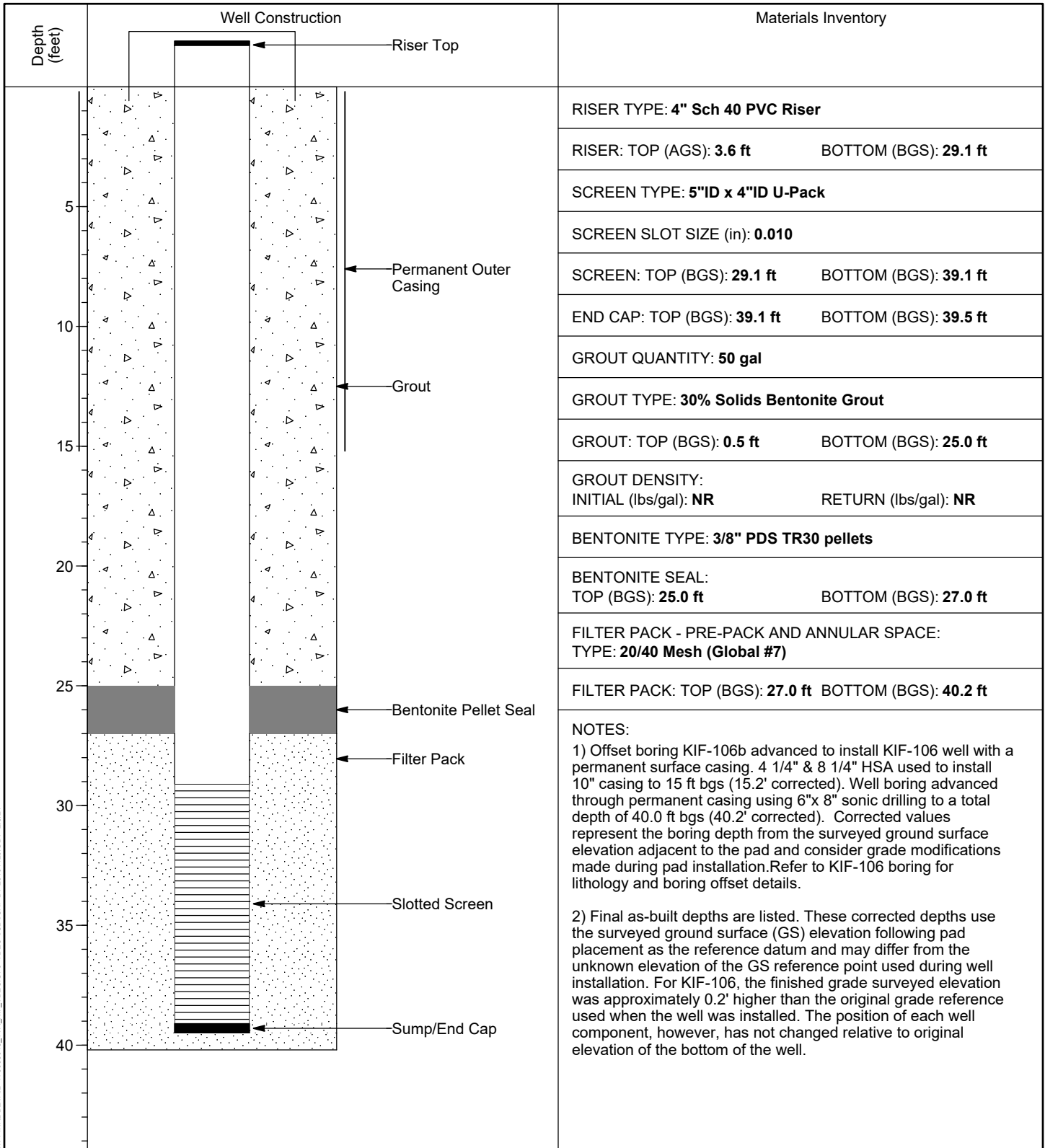


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO: **KIF-106 (Boring KIF-106b)** PAGE 1 OF 1

PROJECT: **KIF TDEC Order**
 PROJECT NUMBER: **175668043**
 DRILLING COMPANY: **Stantec / M&W Drilling**
 DRILLING EQUIPMENT: **CME 850XR #853/Geoprobe 8150LS Sonic**
 DRILLING METHOD: **4-1/4" & 8-1/4" HSA to 15'; 6"x8" Sonic to depth**
 SAMPLING METHOD: **4-1/4" & 8-1/4" HSA to 15'; 6"x8" Sonic to depth**
 OBSERVED BY: **B. Evans**
 REVIEWED BY: **C. Kocka**
 APPROVED BY: **L. Price**

INSTALLATION: STARTED: **10/31/18** COMPLETED: **11/1/18**
 LOCATION: **574,439.09 N; 2,408,024.18 E** DATUM: **NAD83**
 LOC. DESCRIP: **Sluice Trench**
 LATITUDE: **35° 54' 8.22"** LONGITUDE: **-84° 30' 57.15"**
 GROUND ELEV (ft): **757.6** TOC ELEV (ft): **761.27**
 ELEVATION DATUM: **NGVD29**
 WELL DEPTH (ft, bgs): **39.5**
 DTW AT COMPLETION (ft, bgs): **N/A**
 BOREHOLE DIA. (in): **8.0** WELL DIA. (in): **4.0**



MW FINAL DETAIL 175668043 TVA_KIF_TDEC.GPJ TDEC SUBSURF DT 20191120.GDT 2/5/21

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)

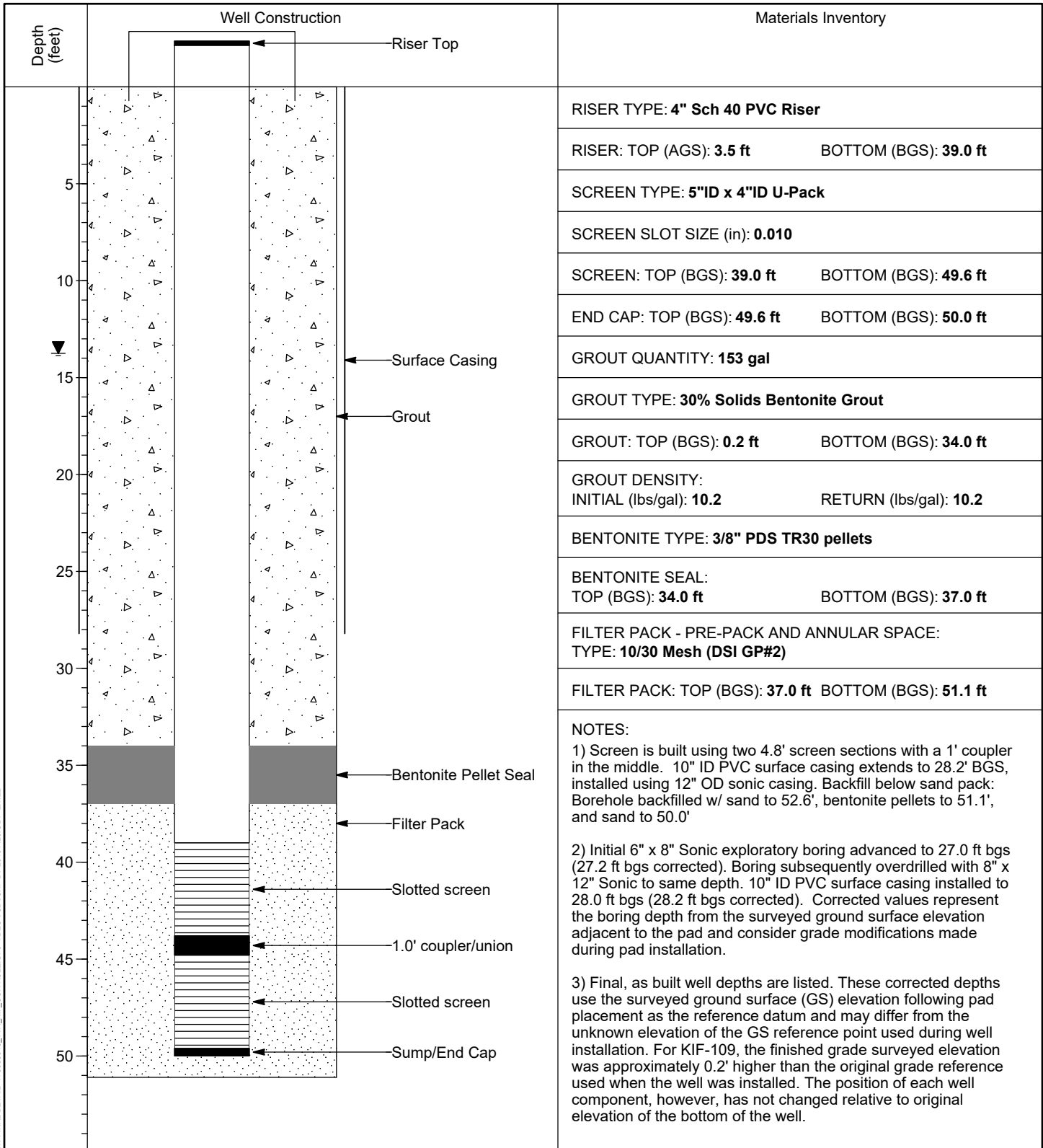


WELL INSTALLATION DETAIL

WELL / PROBEHOLE / BOREHOLE NO:

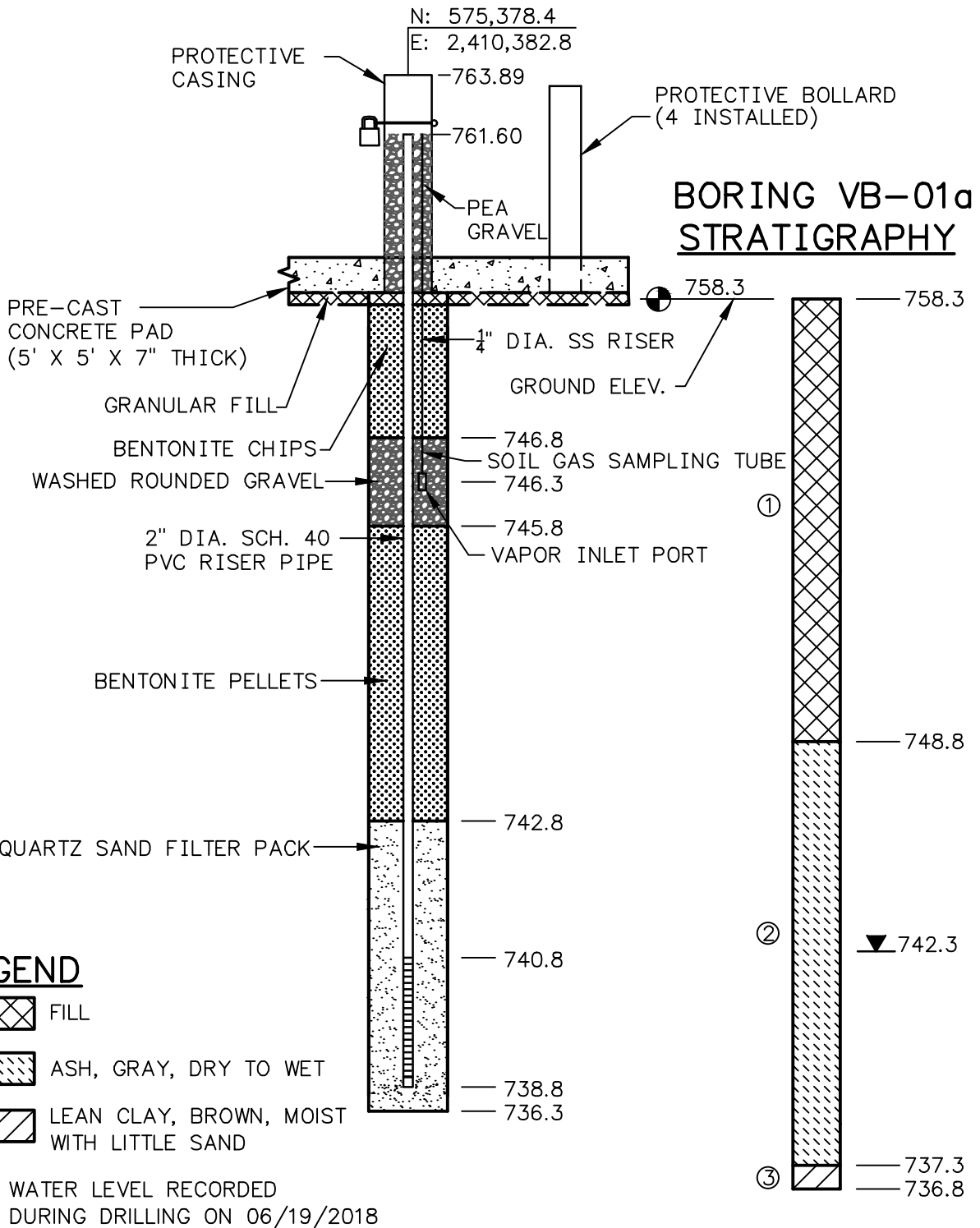
PAGE 1 OF 1

KIF-109 (Boring KIF-109)

PROJECT: **KIF CCR Rule**PROJECT NUMBER: **175668053**DRILLING COMPANY: **Hawkston (Subcontractor)**DRILLING EQUIPMENT: **Boart Longyear LS600**DRILLING METHOD: **8" x 12" Rotasonic**SAMPLING METHOD: **6" x 8" Rotasonic**OBSERVED BY: **E. Smith II**REVIEWED BY: **B. Evans**APPROVED BY: **E. Smith II**INSTALLATION: STARTED: **12/7/20**COMPLETED: **12/9/20**LOCATION: **575,305.85 N; 2,409,009.99 E**DATUM: **NAD83**LOC. DESCRIP: **Gravel road west of engineered wetland**LATITUDE: **35° 54' 16.65"**LONGITUDE: **84° 30' 45.00"**GROUND ELEV (ft): **757.6**TOC ELEV (ft): **761.08**ELEVATION DATUM: **NGVD29**WELL DEPTH (ft, bgs): **50.0**DTW AT COMPLETION (ft, bgs): **13.8**BOREHOLE DIA. (in): **8.0**WELL DIA. (in): **4.0**

MW FINAL DETAIL 175668043 TVA_KIF_CCR-RULE.GPJ TDEC SUBSURF DT 20191120.GDT 2/7/22

VERTICAL SCALE: AS SHOWN. HORIZONTAL SCALE: NOT TO SCALE (EXAGGERATED TO SHOW DETAIL)



LEGEND

- ① FILL
- ② ASH, GRAY, DRY TO WET
- ③ LEAN CLAY, BROWN, MOIST WITH LITTLE SAND
- WATER LEVEL RECORDED DURING DRILLING ON 06/19/2018

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG VB-01a (06/19/2018).
2. SURVEY INFORMATION PROVIDED BY PHILLIPS & JORDAN INC. (NAD83/NGVD88 SHOWN).
3. WELL INSTALLED ON 06/19/2018.

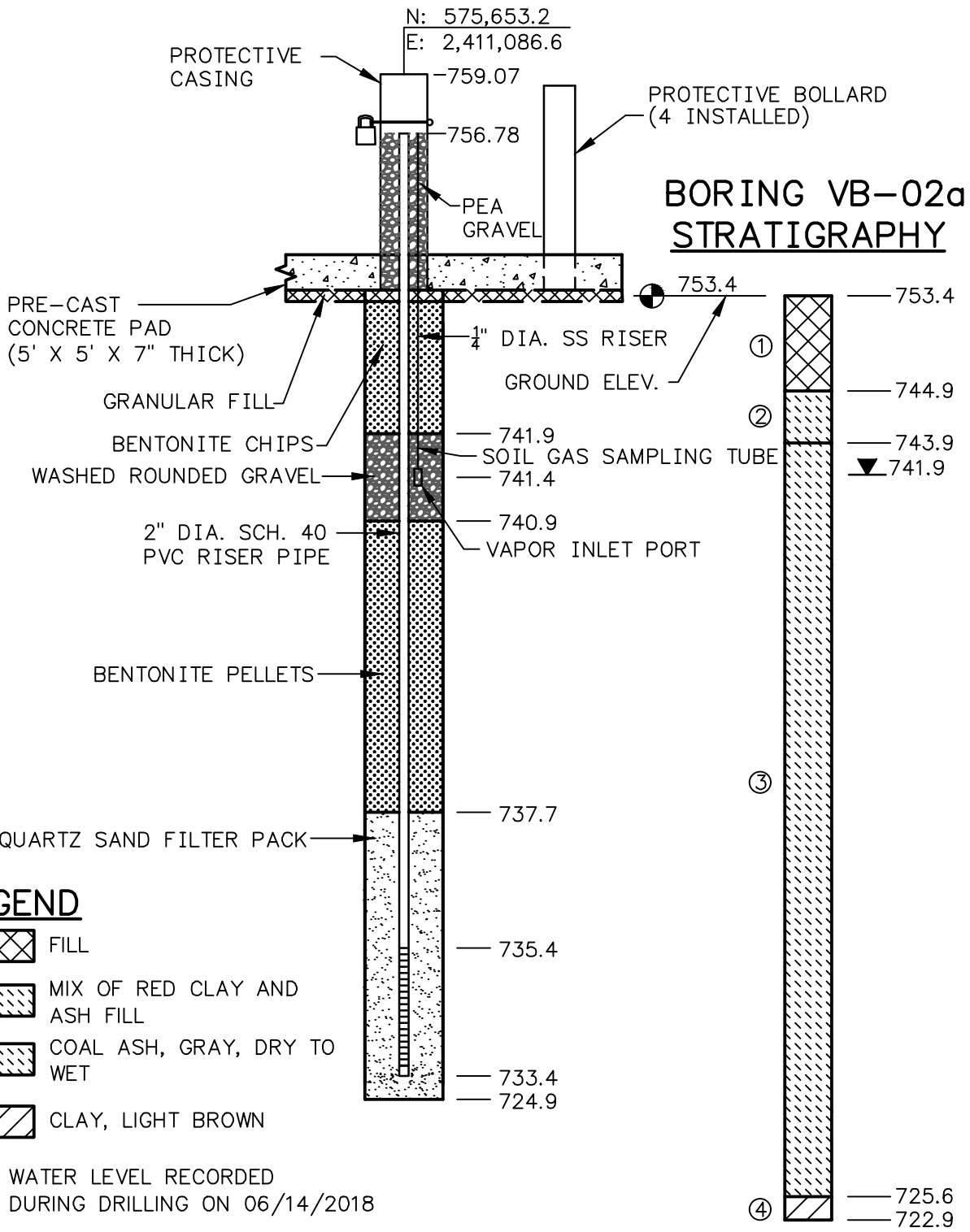
**VB-01 SOIL GAS AND PORE WATER WELLS
TVA KINGSTON FOSSIL PLANT STILLING POND
HARRIMAN, ROANE COUNTY, TN**

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513
www.stantec.com

DRAWN BY	MSJ	DATE	JULY, 2018	REVISED	SHEET
CHECKED BY	JGB	PROJ. NO.	175618806	1.	3.
CHECKED BY	DN	SCALE	NTS	2.	4.

1 of 1

PLOT DATE: 07/27/2018 USER: CLINKENBEARD, ADAM
u: \1756\175618806_KIF_SOIL_GAS_WELL_LOGS\18806-VB-01.DWG



LEGEND

- ① FILL
 - ② MIX OF RED CLAY AND ASH FILL
 - ③ COAL ASH, GRAY, DRY TO WET
 - ④ CLAY, LIGHT BROWN
- ▼ WATER LEVEL RECORDED DURING DRILLING ON 06/14/2018

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG VB-02a (06/14/2018).
2. SURVEY INFORMATION PROVIDED BY PHILLIPS & JORDAN INC. (NAD83/NGVD88 SHOWN).
3. WELL INSTALLED ON 06/14/2018.

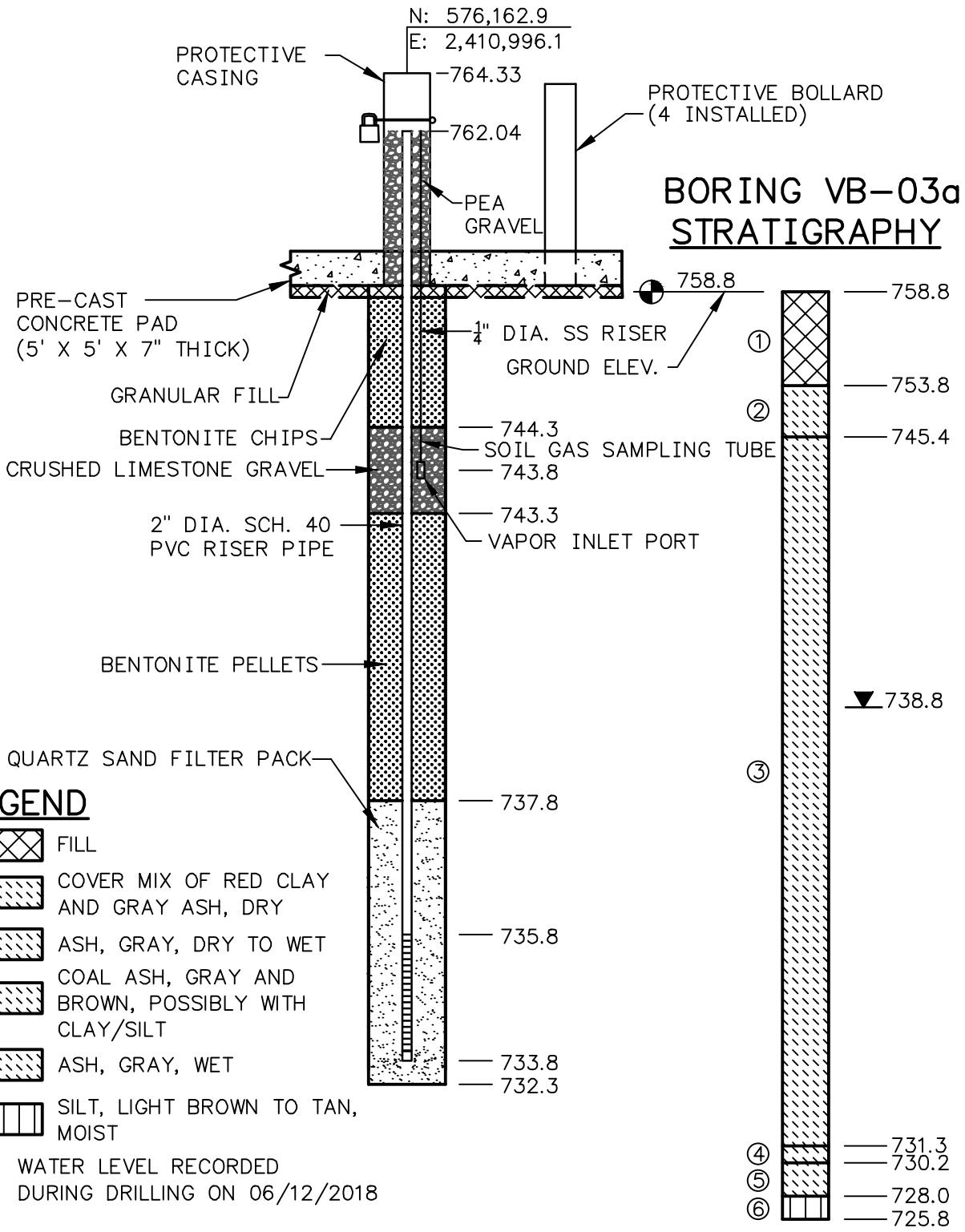
**VB-02 SOIL GAS AND PORE WATER WELLS
TVA KINGSTON FOSSIL PLANT STILLING POND
HARRIMAN, ROANE COUNTY, TN**

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513
www.stantec.com

DRAWN BY	MSJ	DATE	JULY, 2018	REVISED	SHEET
CHECKED BY	JGB	PROJ. NO.	175618806	1.	3.
CHECKED BY	DN	SCALE	NTS	2.	4.

1 of 1

PLOT DATE: 07/27/2018 USER: CLINKENBEARD, ADAM
u: \1756\175618806_KIF_SOIL_GAS_WELL_LOGS\18806-VB-02.DWG



LEGEND

- ① FILL
- ② COVER MIX OF RED CLAY AND GRAY ASH, DRY
- ③ ASH, GRAY, DRY TO WET
- ④ COAL ASH, GRAY AND BROWN, POSSIBLY WITH CLAY/SILT
- ⑤ ASH, GRAY, WET
- ⑥ SILT, LIGHT BROWN TO TAN, MOIST

NOTES:

1. SUBSURFACE STRATIGRAPHY BASED ON BORING LOG VB-03a (06/12/2018).
2. SURVEY INFORMATION PROVIDED BY PHILLIPS & JORDAN INC. (NAD83/NGVD88 SHOWN).
3. WELL INSTALLED ON 06/12/2018.

**VB-03 SOIL GAS AND PORE WATER WELLS
TVA KINGSTON FOSSIL PLANT STILLING POND
HARRIMAN, ROANE COUNTY, TN**

Stantec Consulting Services Inc.
3052 Beaumont Centre Circle
Lexington, Kentucky 40513
www.stantec.com

DRAWN BY	MSJ	DATE	JULY, 2018	REVISED	SHEET
CHECKED BY	JGB	PROJ. NO.	175618806	1.	3.
CHECKED BY	DN	SCALE	NTS	2.	4.

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PLOT DATE: 07/27/2018 USER: CLINKENBEARD, ADAM
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