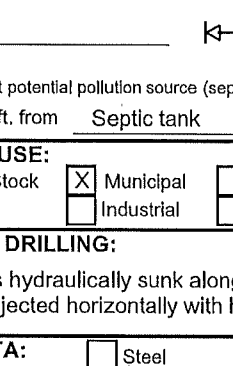
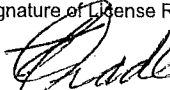


SOUTH DAKOTA WATER WELL COMPLETION REPORT

11-02

Location <u>SE 1/4 NW 1/4</u> Sec <u>9</u> Twp <u>102N</u> Rg <u>49W</u>		Well Owner: <u>City of Sioux Falls</u>	
County <u>Minnehaha</u>		Business Name: <u>City of Sioux Falls</u>	
Please mark well location with an "X"		Address: <u>PO Box 7402</u>	
		City, State, Zip: <u>Sioux Falls, SD 57117-7402</u>	
		WELL LOG:	
		DEPTH	
		FORMATION	FROM TO
		See attached document for each lateral	
Well Completion Date <u>July 7, 2022</u>		per AWM 05/28/2024	
Distance to nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? <u>2,570</u> ft. from <u>Septic tank</u> (Identify source)			
PROPOSED USE:			
☐ Domestic/Stock ☒ Municipal ☐ Business ☐ Test holes ☐ Irrigation ☐ Industrial ☐ Institutional ☐ Monitoring well			
METHOD OF DRILLING:			
Caisson was hydraulically sunk along with camp shell soil removal. Screen's projected horizontally with hydraulics.			
CASING DATA: ☐ Steel ☐ Plastic ☒ Other			
If other describe <u>concrete caisson for horizontal collector well</u>			
PIPEWEIGHT	DIAMETER	FROM	TO
<u>N/A</u> LB/FT	<u>192</u> IN	<u>0</u> FT	<u>39.7</u> FT
<u> </u> LB/FT	<u> </u> IN	<u> </u> FT	<u> </u> FT
<u> </u> LB/FT	<u> </u> IN	<u> </u> FT	<u> </u> FT
GROUTING DATA:			
Grout Type	No. of Sacks	Grout Weight	From To
<u>N/A</u>	<u>N/A</u>	<u>N/A</u> Lb/gal	<u>N/A</u> Ft <u>N/A</u> Ft
Describe grouting procedure			
SCREEN: ☐ Perforated pipe ☒ Manufactured			
Diameter	<u>12</u> Inches	Length	<u>910</u> Feet
Material <u>Wire-wound Stainless Steel 304</u>			
Slot Size <u>See attach</u> Set From <u>See attach</u> Feet to <u>See attach</u> Feet			
Other information <u>Six (6) horizontal laterals ranging from 70-ft to 210-ft, screen slot size varies and is included in the attached document</u>			
WAS A PACKER OR SEAL USED? ☐ Yes ☒ No			
If so, what material?			
Describe packer(s) and location			
DISINFECTION: Was well disinfected upon completion?			
☒ Yes, How? <u>200 ppm chlorine solution into each lateral and caisson for 24 hours, well was than de-chlorinated with sodium metabisulfite to obtain a chlorine residual of less than 5.0 ppm.</u>			
Lab to which water quality sample sent for analysis <u>Energy Laboratories</u>			
REMARKS:			
Received by DANR-Water Rights Program May 28, 2024 per A.W. Mathiowetz			
This well was drilled under license # <u>513</u> and this report is true and accurate.			
Drilling firm: <u>Layne Christensen Company</u>			
Signature of License Representative: 			
Signature of Well Owner or Equitable Property Holder: 			
Date: <u>2-1-24</u>			

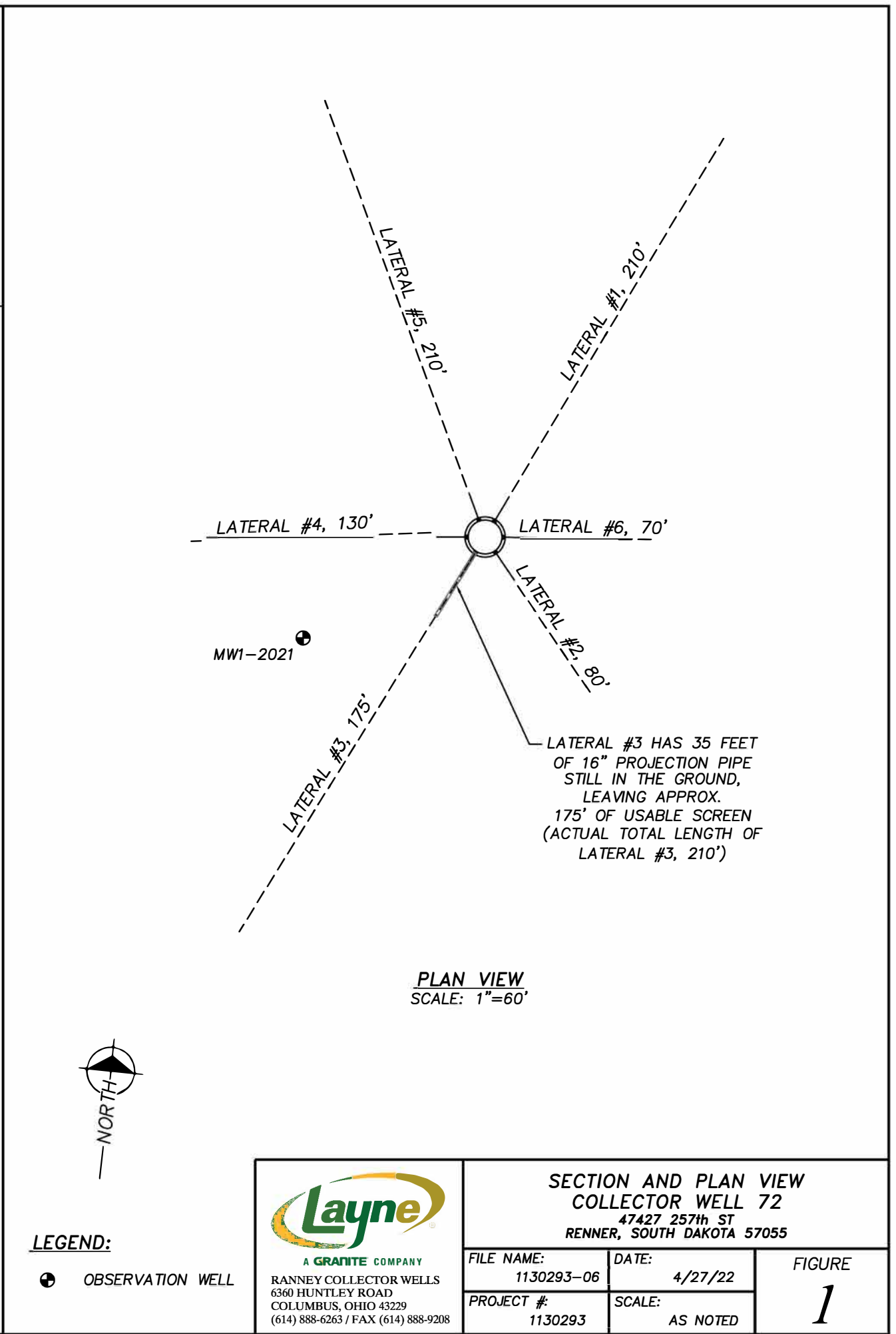
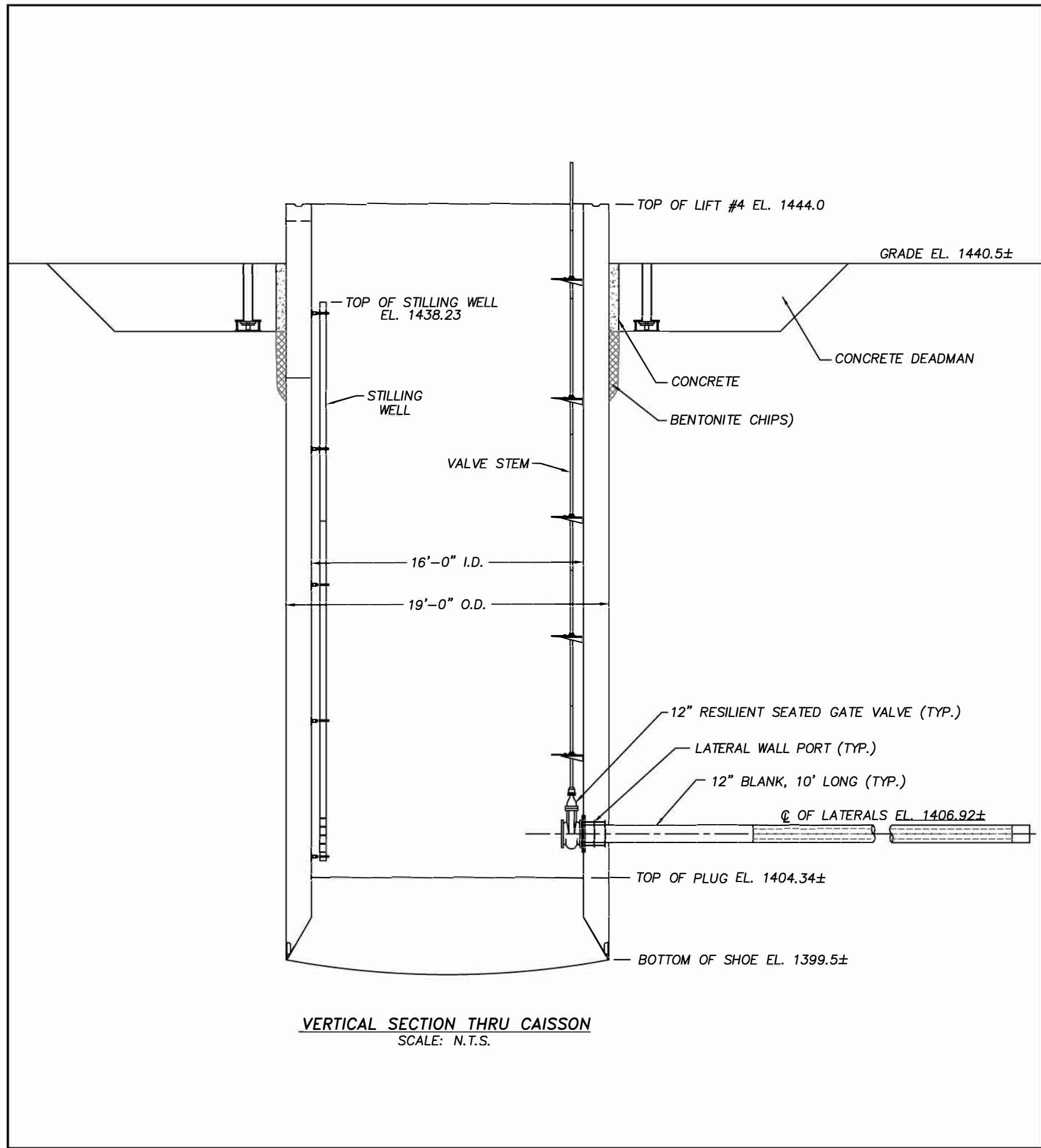


TABLE 1 (continued)
Collector Well 72 Well Design Summary
City of Sioux Falls, South Dakota

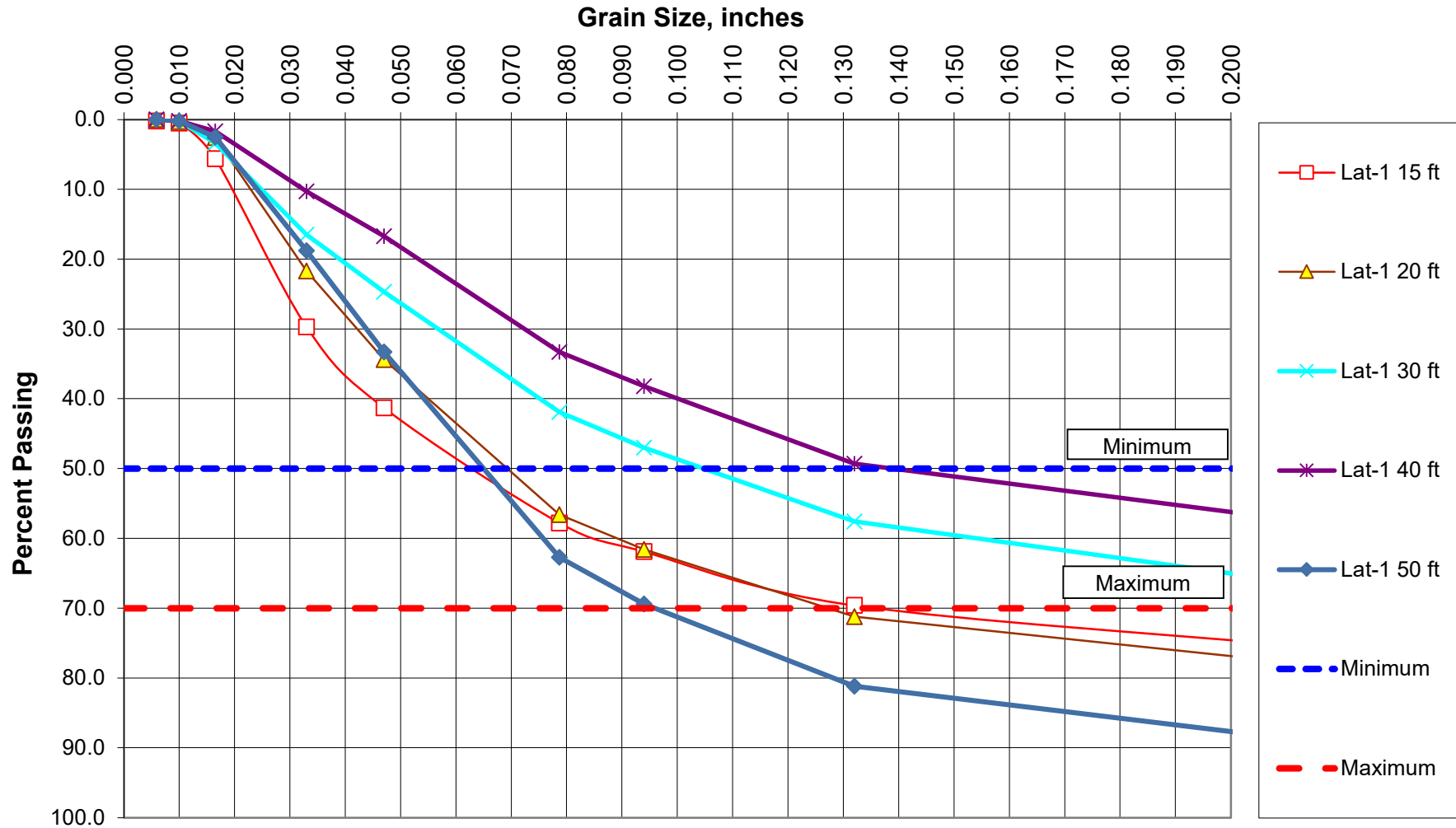
SCREEN MATERIAL: 12.75-inch OD, 12-inch ID, Type 130 Wire-Wound Stainless Steel (wire width 0.130-inch)

LATERAL SCREEN SLOT SIZE PLACEMENT (feet from inside caisson wall)

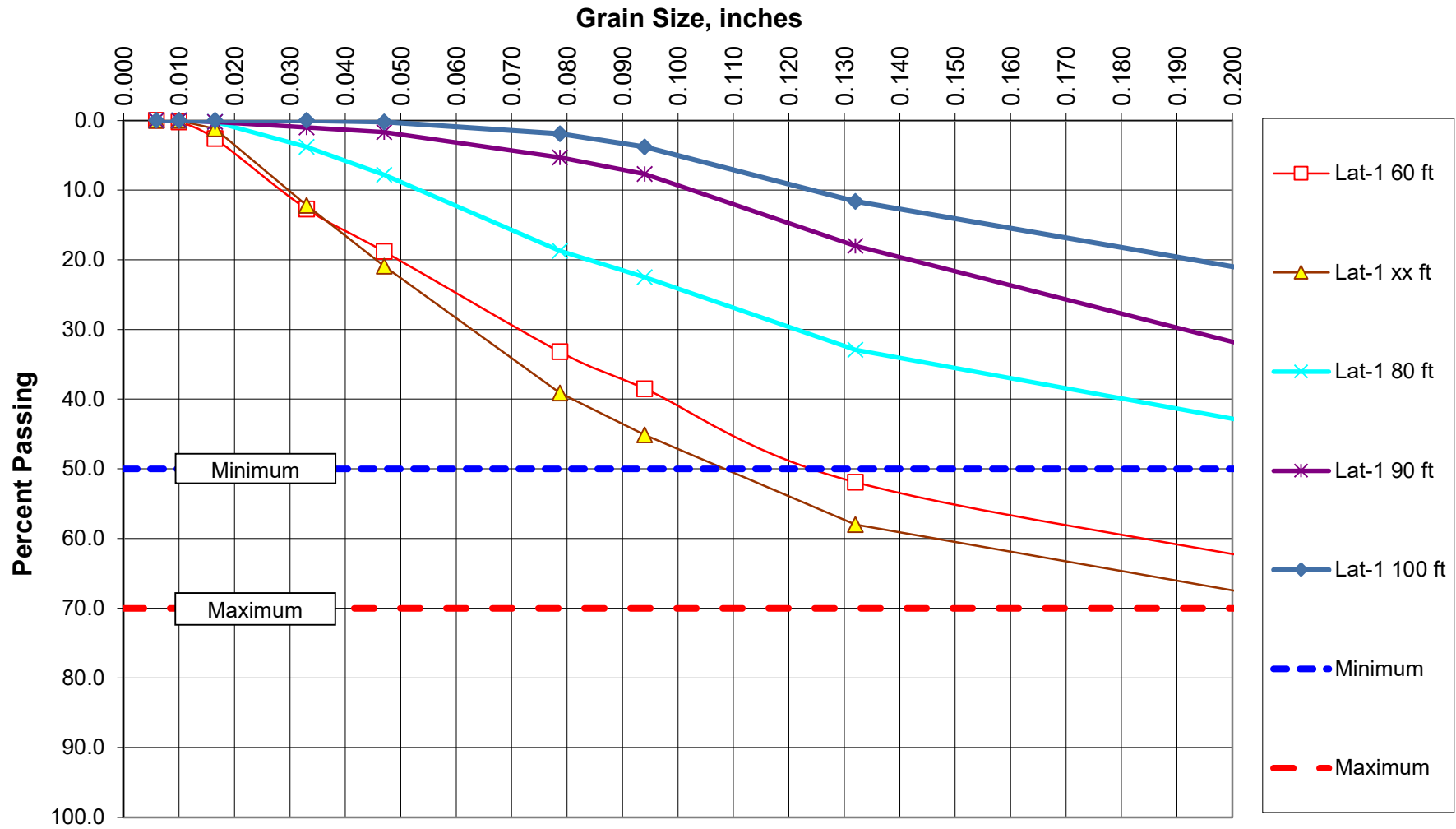
Lateral Number	SCREEN SLOT SIZE (inches)								
	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.125	0.150
1			180-190 190-200 200-210	50-60 170-180	10-20 20-30 40-50 60-70 160-170	30-40 70-80 130-140 140-150 150-160		80-90 120-130	90-100 100-110 110-120
2			70-80	50-60 60-70	10-20 20-30	30-40 40-50			
3	200-210		170-180 190-200	150-160 160-170 180-190	130-140 140-150	35-40 50-60 120-130		40-50 60-70 90-100 110-120	70-80 80-90 100-110
4			10-20 50-60	40-50 60-70 110-120 120-130	20-30 100-110	30-40 70-80 90-100		80-90	
5	160-170	110-120		30-40 40-50 70-80 100-110	20-30 50-60 60-70 90-100 120-130 150-160 170-180	10-20 80-90	130-140 140-150 180-190 190-200 200-210		
6				60-70	30-40 40-50	10-20 50-60		20-30	
Total Length	20	10	80	160	200	165	50	80	60

TOTAL SCREEN OPEN AREA (Adjusted for couplings and blank sections): 1,023 ft²

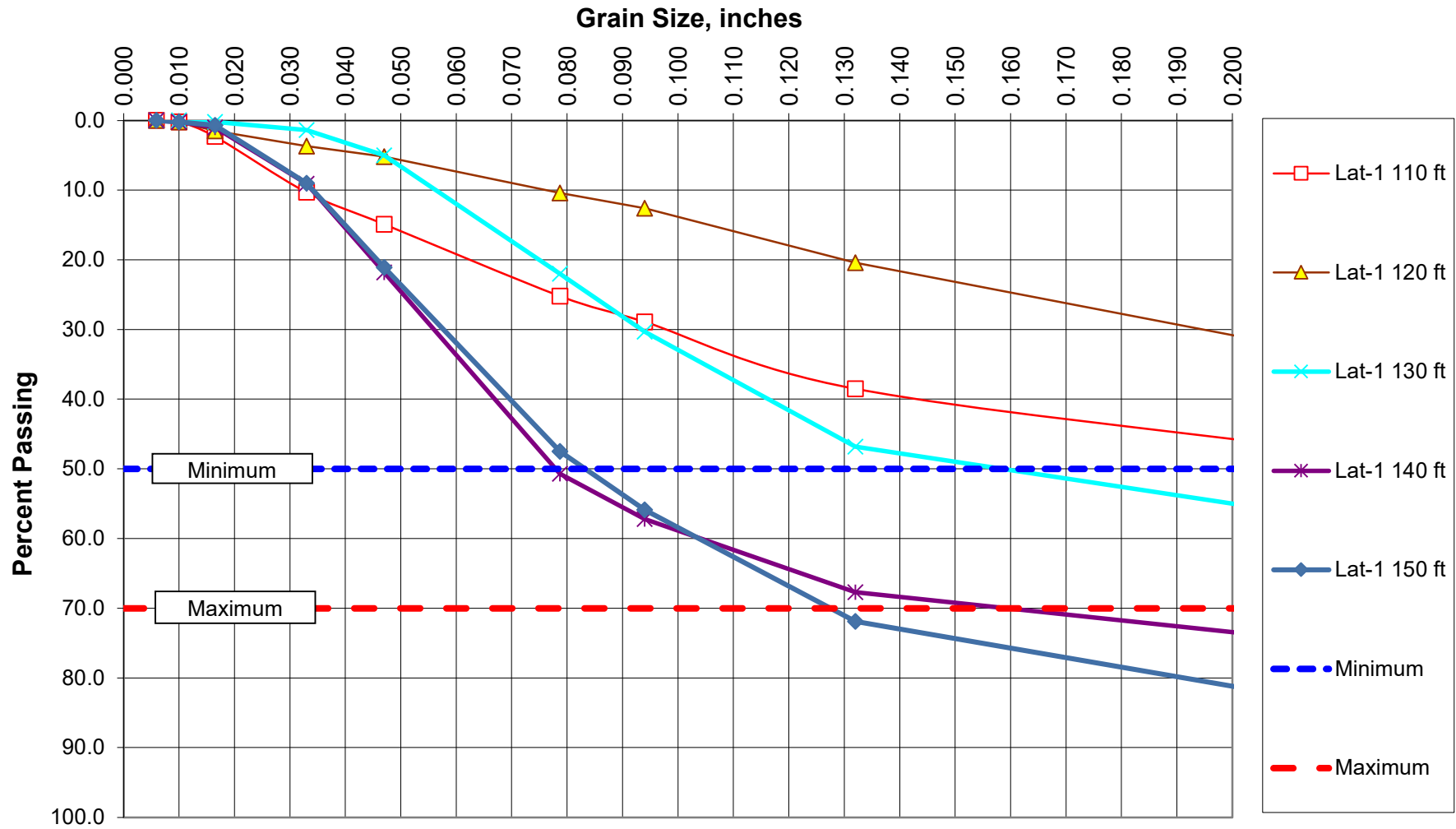
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 1



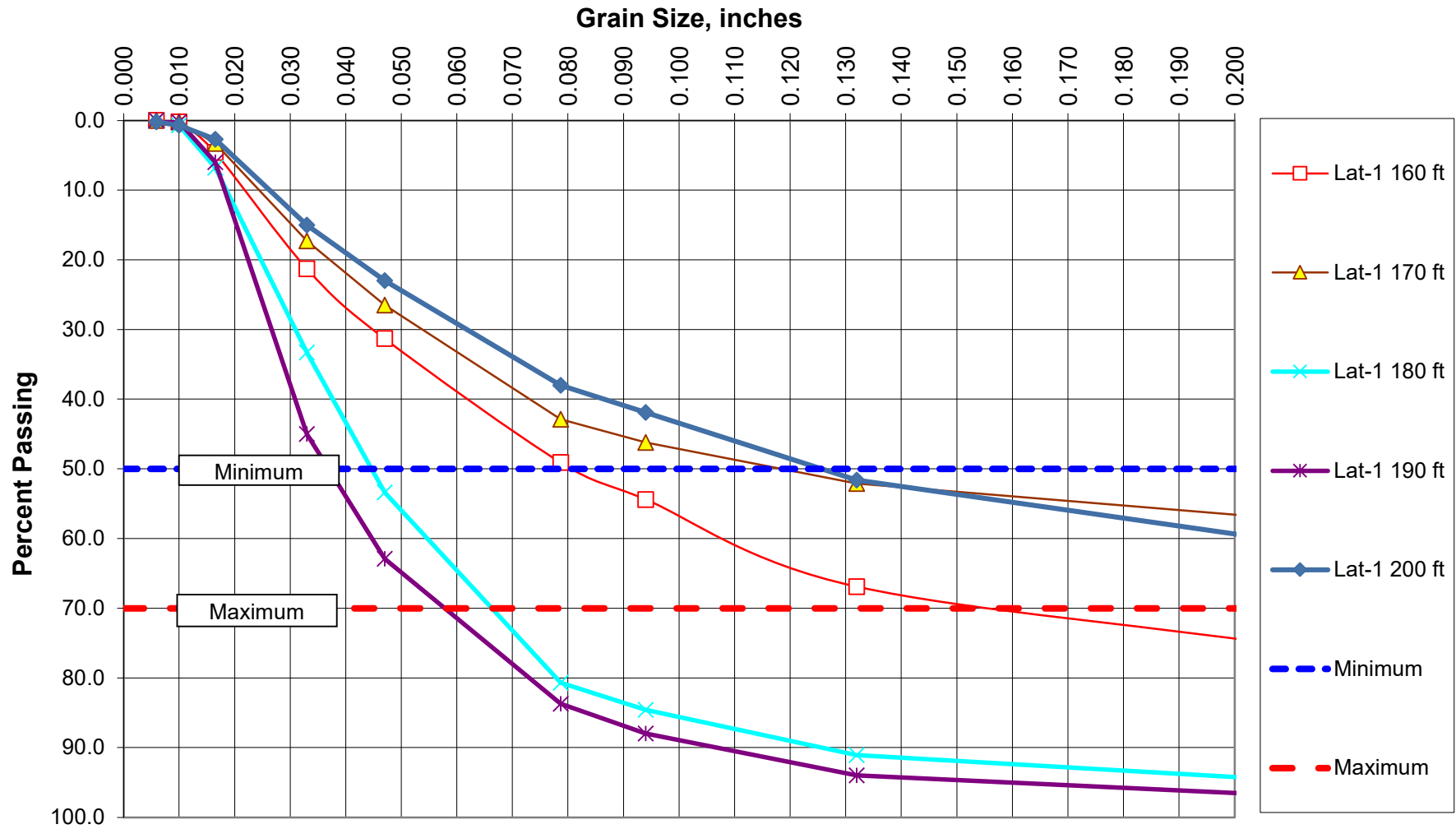
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 1



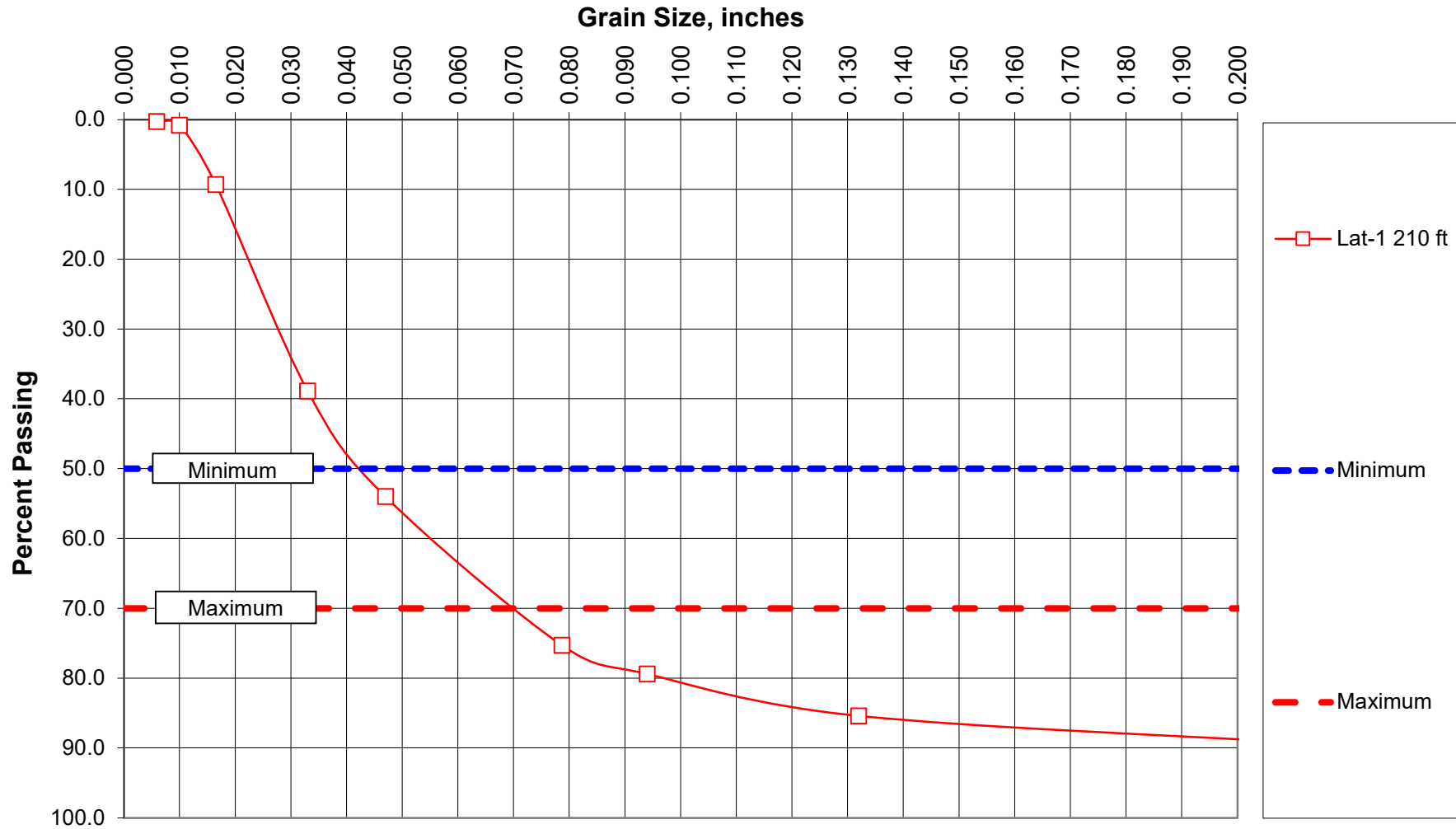
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 1



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 1



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 1



Collector Well

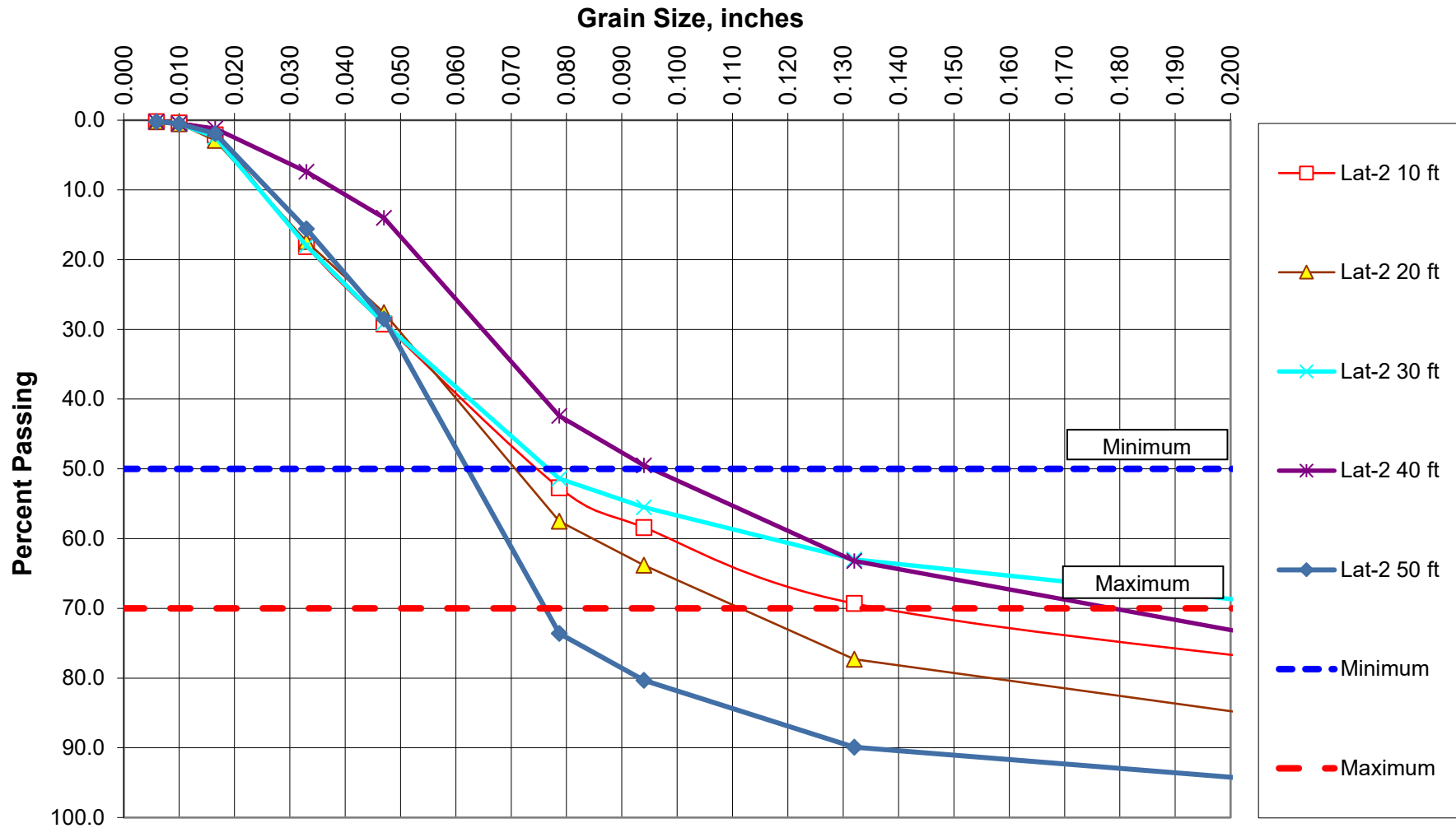
Recommended Screen Slot Distribution

Client:	Sioux Falls, SD	
Well ID:	Collector Well 72	
Lateral Number:	1	
Lateral Length:	210	feet
Screen Length:	200	feet
Date Completed:	11/12/2021	

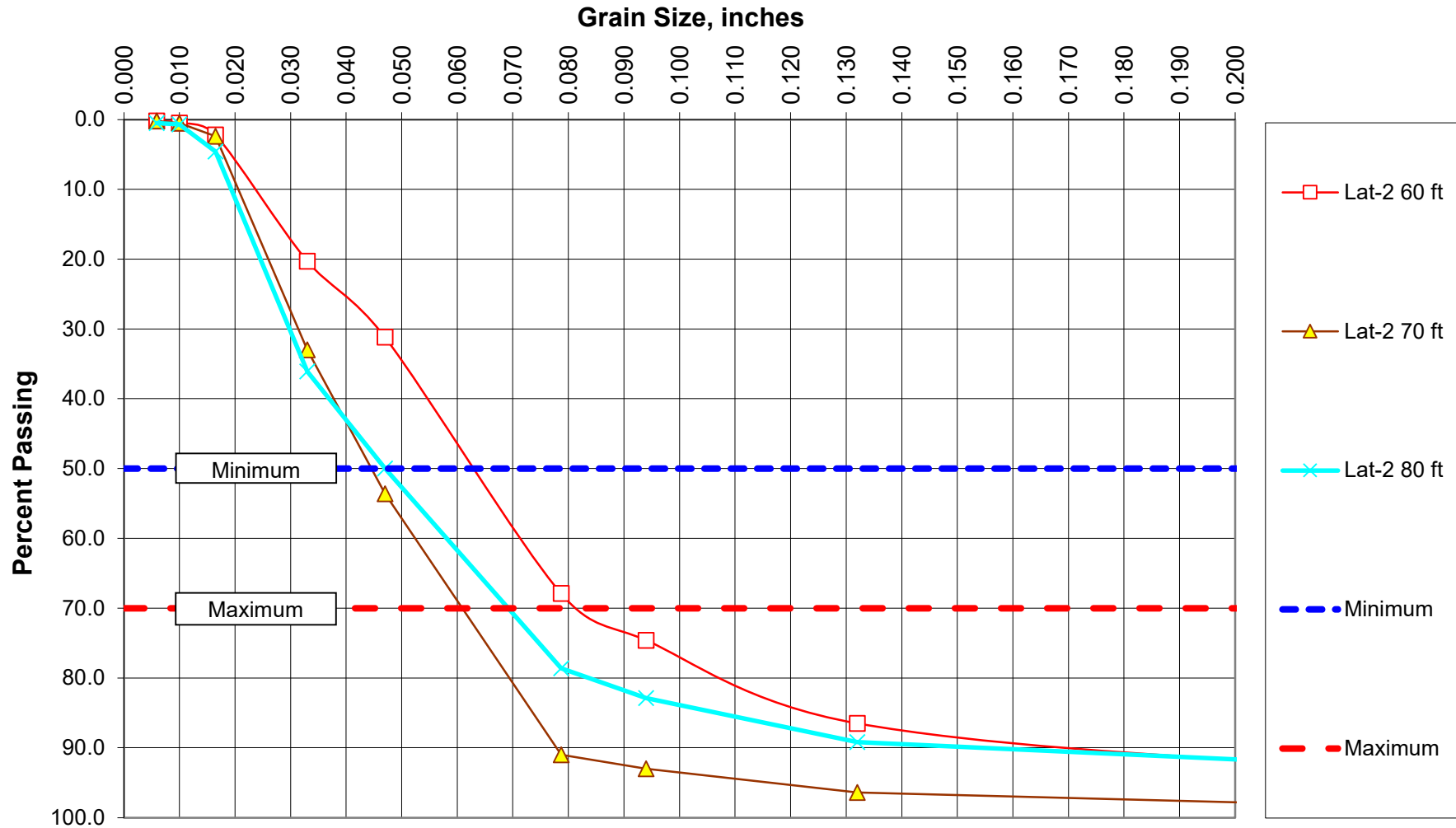
Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	80	slot
20-30	80	slot
30-40	100	slot
40-50	80	slot
50-60	60	slot
60-70	80	slot
70-80	100	slot
80-90	125	slot
90-100	150	slot
100-110	150	slot
110-120	150	slot
120-130	125	slot
130-140	100	slot
140-150	100	slot
150-160	100	slot
160-170	80	slot
170-180	60	slot
180-190	50	slot
190-200	50	slot
200-210	50	slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	0	0
40	0	0
50	3	30
60	2	20
80	5	50
100	5	50
125	2	20
150	3	30
Total	21	210

Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 2



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 2



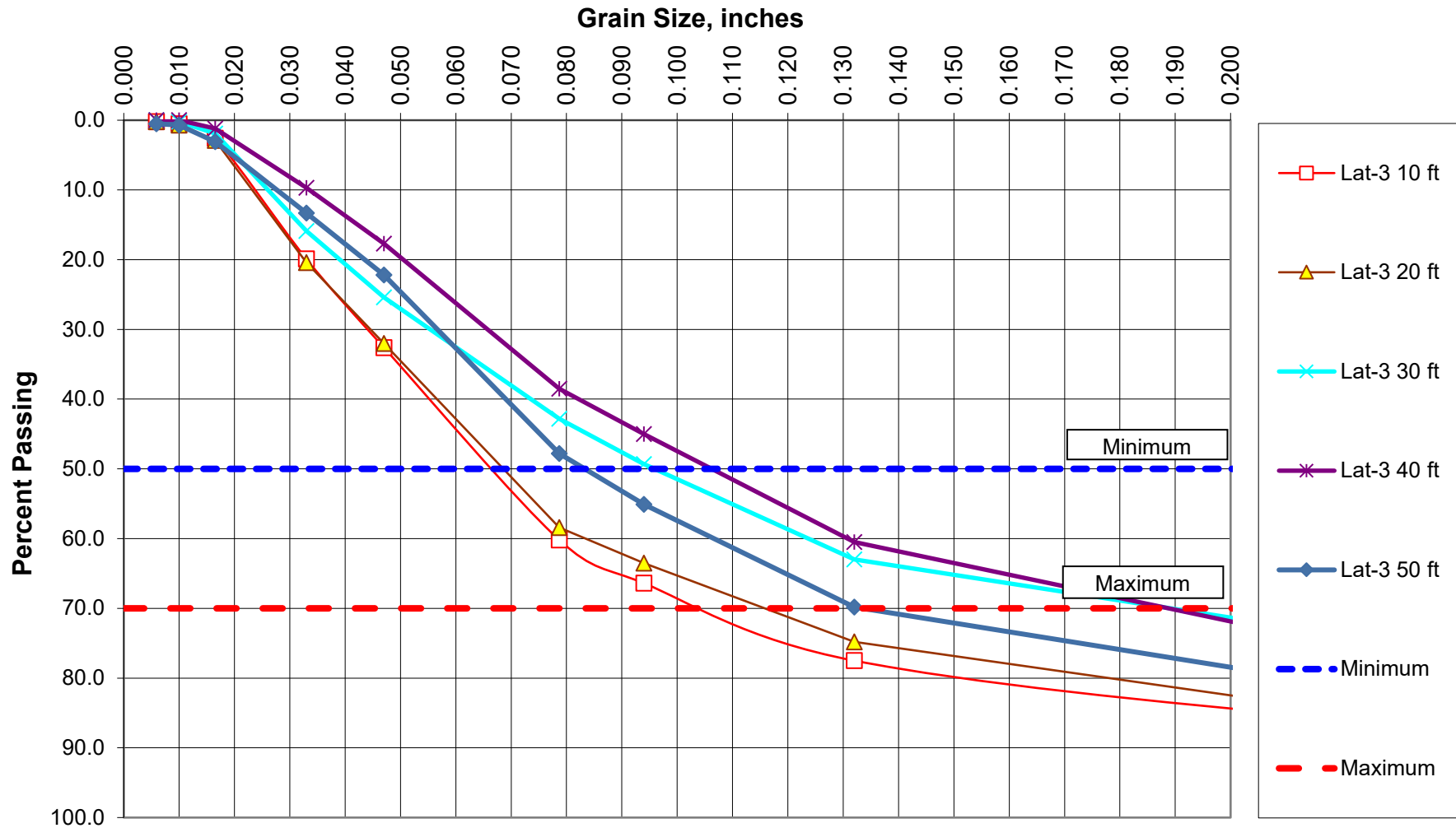
Collector Well
Recommended Screen Slot Distribution

Client:	Sioux Falls, SD	
Well ID:	Collector Well 72	
Lateral Number:	2	
Lateral Length:	80	feet
Screen Length:	70	feet
Date Completed:	12/3/2021	

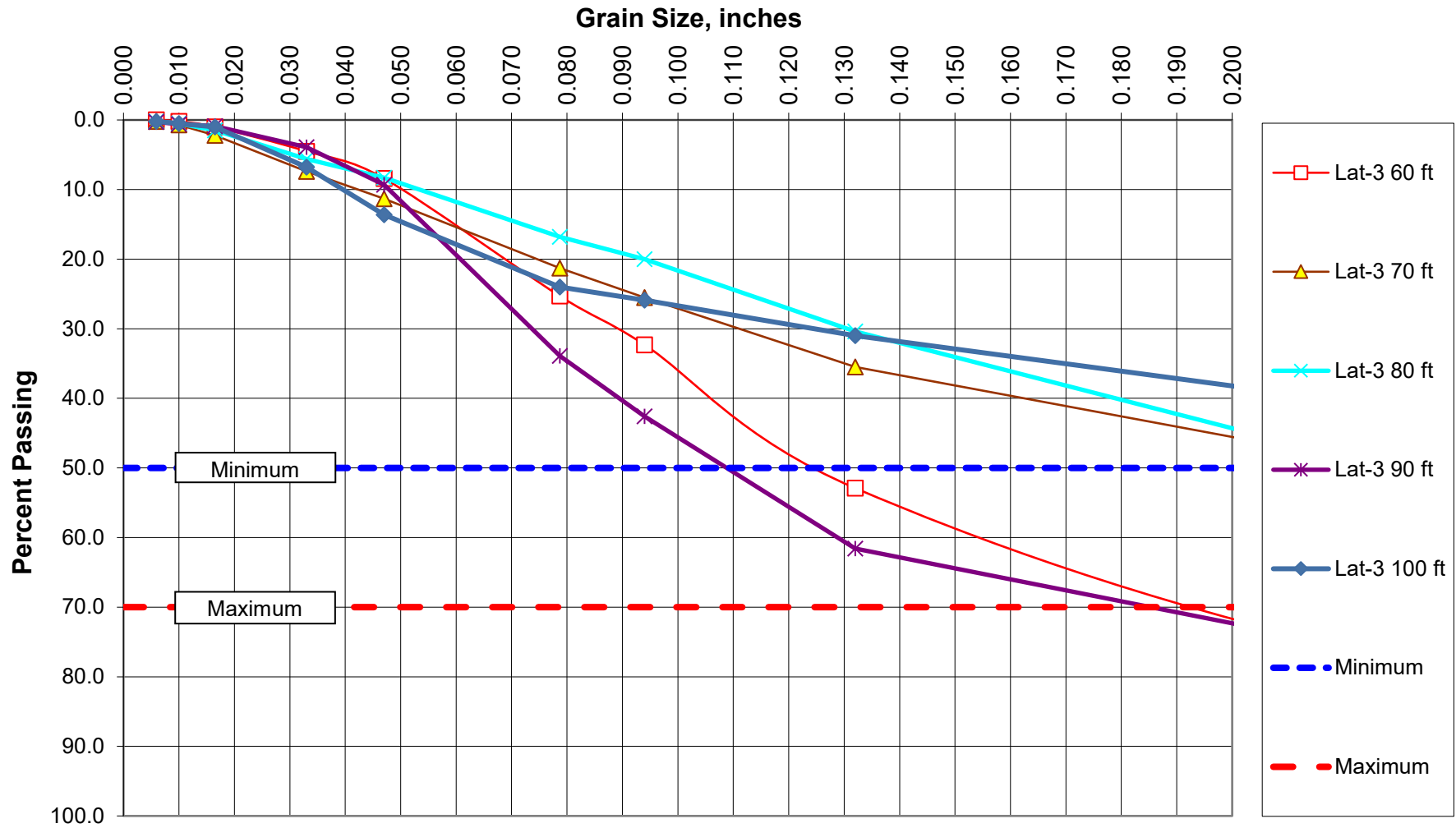
Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	80	slot
20-30	80	slot
30-40	100	slot
40-50	100	slot
50-60	60	slot
60-70	60	slot
70-80	50	slot
80-90		slot
90-100		slot
100-110		slot
110-120		slot
120-130		slot
130-140		slot
140-150		slot
150-160		slot
160-170		slot
170-180		slot
180-190		slot
190-200		slot
200-210		slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	0	0
40	0	0
50	1	10
60	2	20
80	2	20
100	2	20
125	0	0
150	0	0
Total	8	80

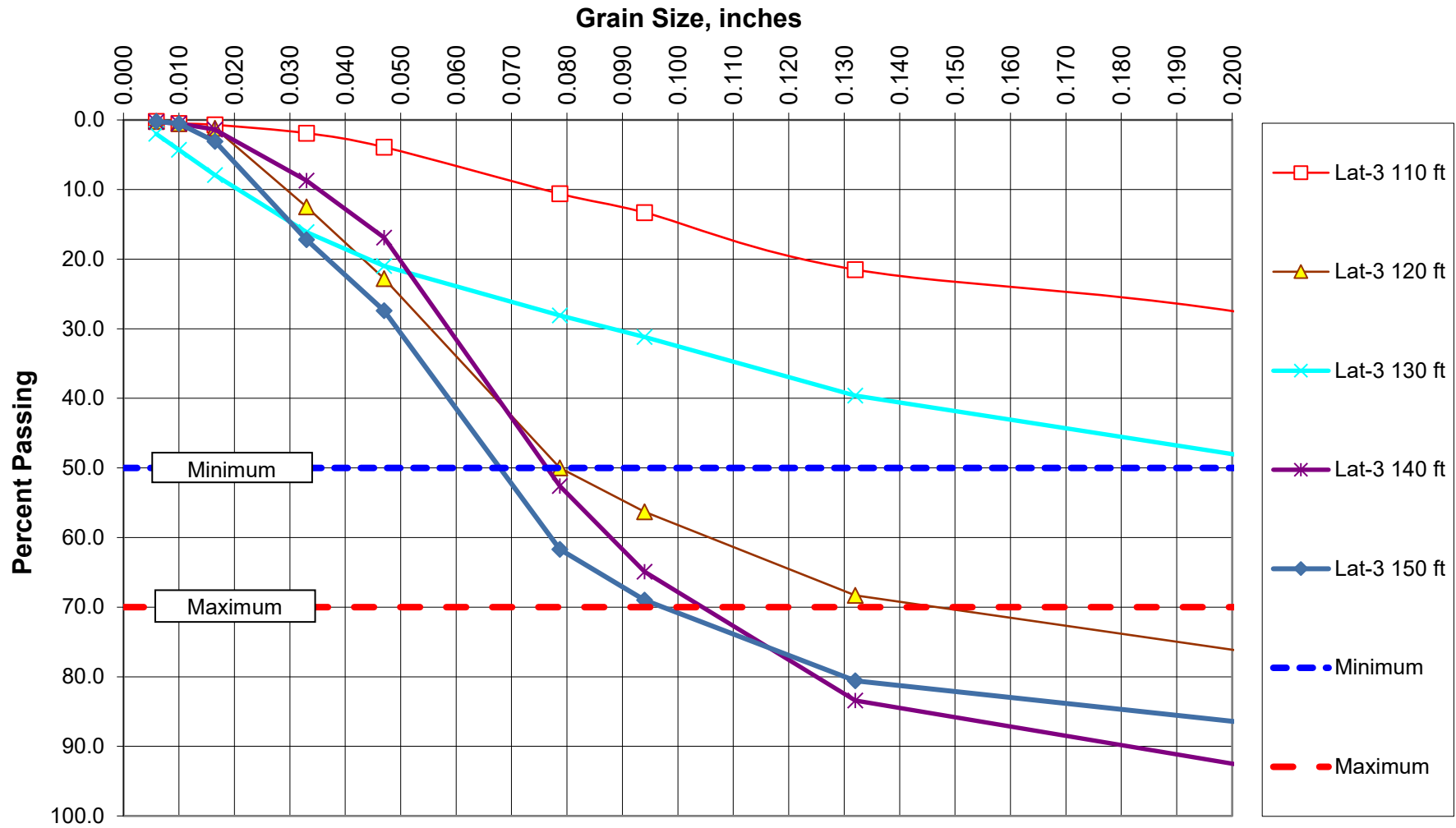
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 3



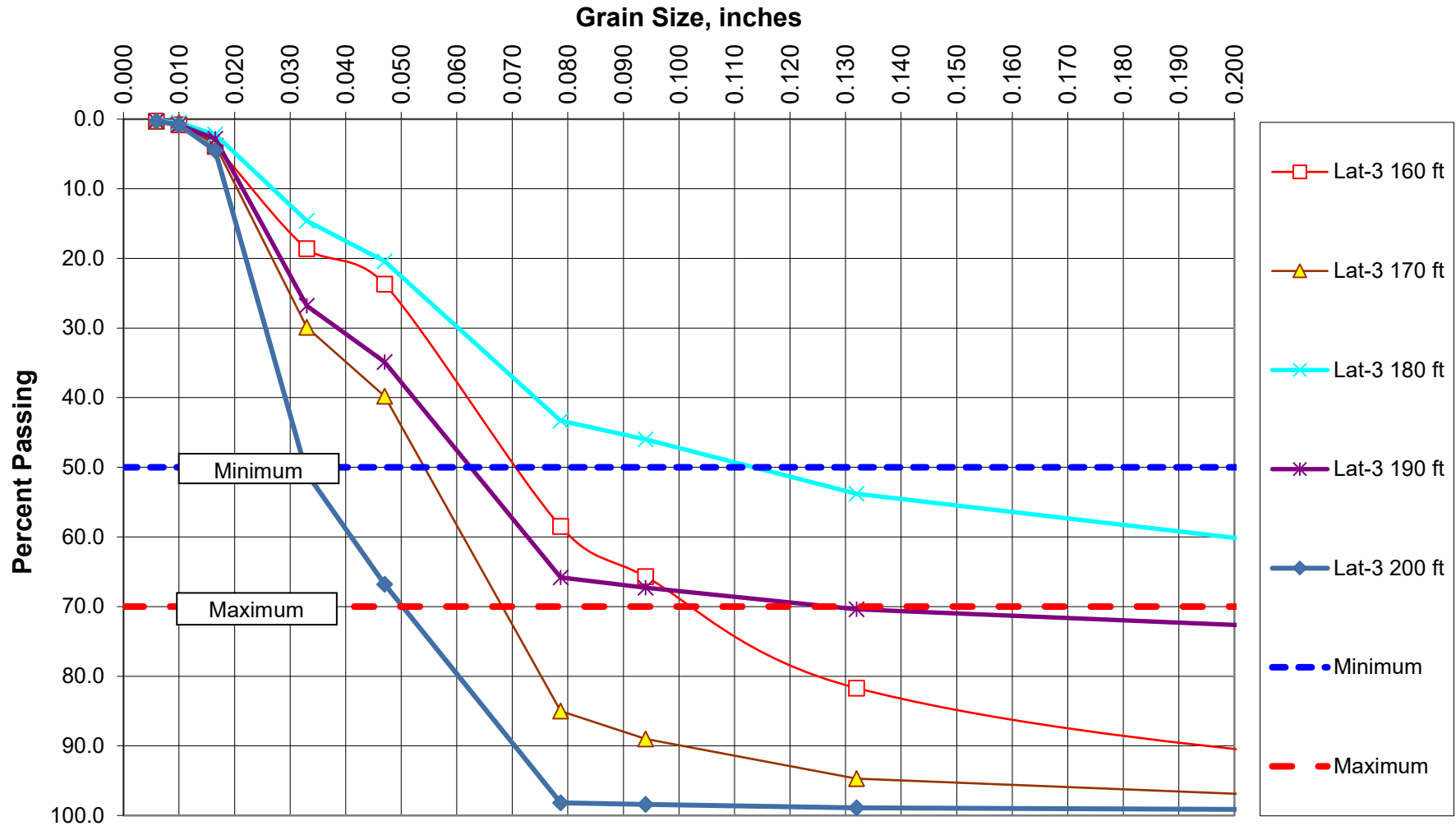
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 3



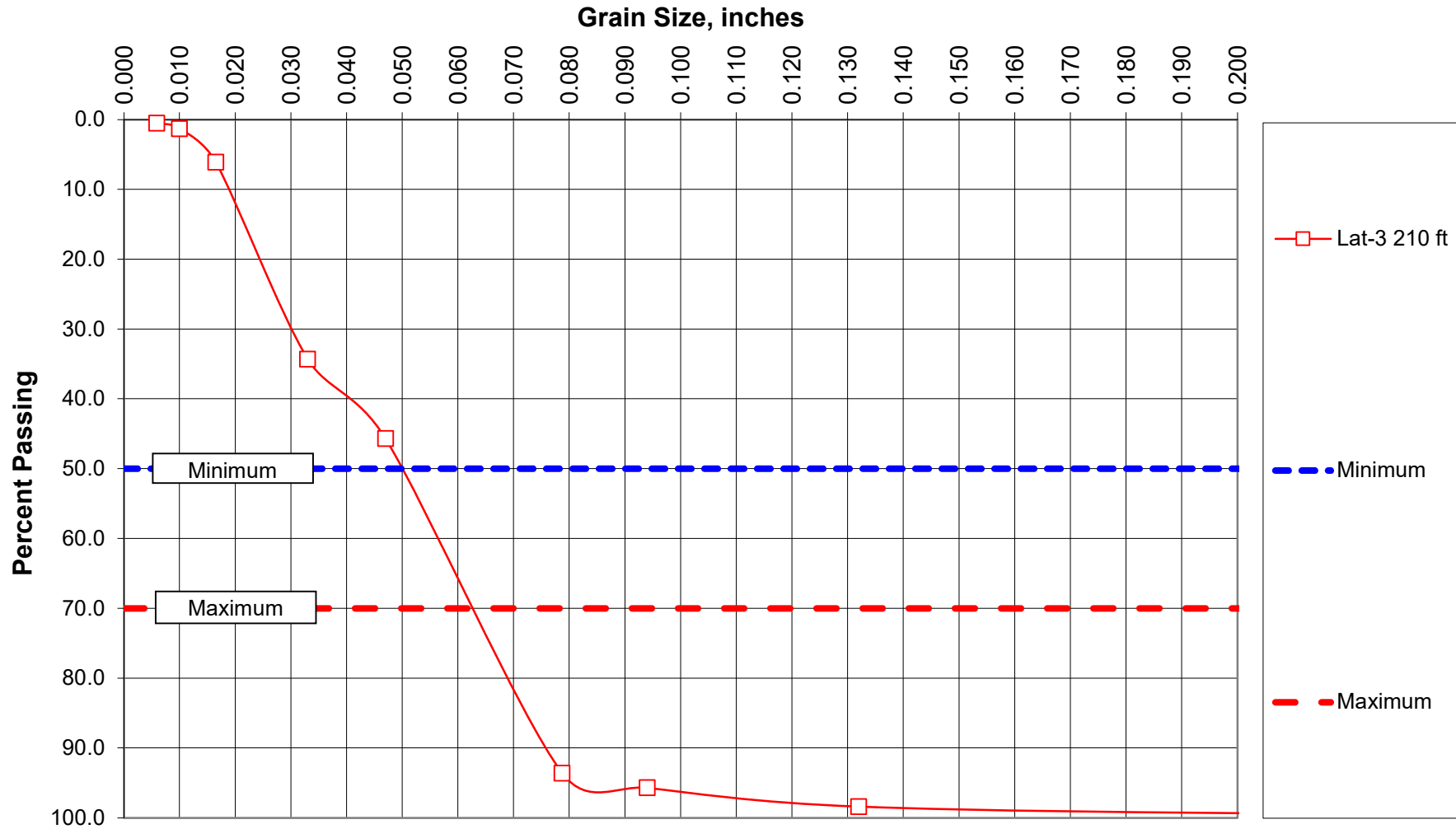
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 3



Grain Size Analyses
Sioux Falls, SD
Well 72
Lateral 3



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 3



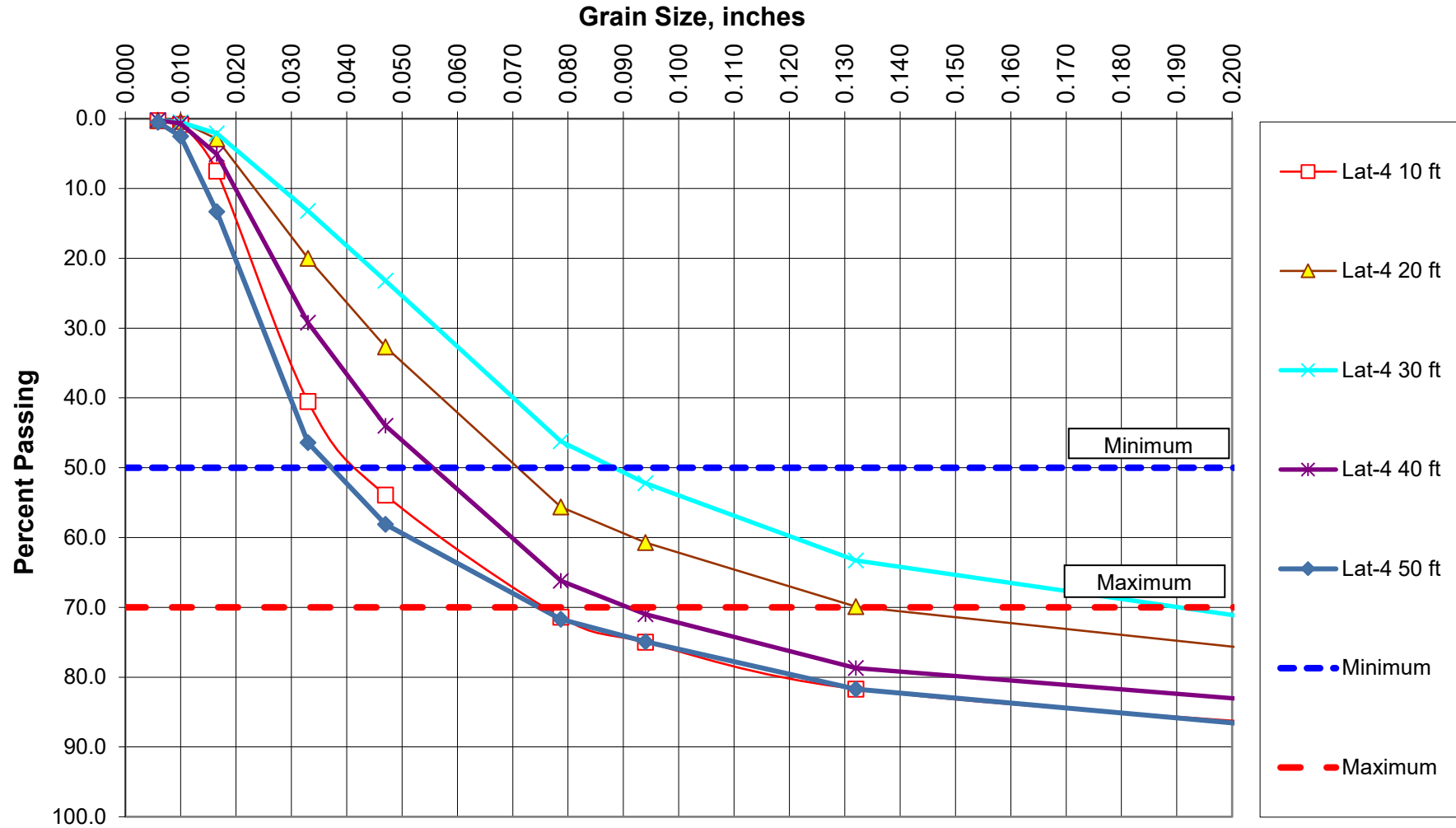
Collector Well
Recommended Screen Slot Distribution

Client:	Sioux Falls, SD
Well ID:	Collector Well 72
Lateral Number:	3
Lateral Length:	feet
Screen Length:	feet
Date Completed:	12/9/2021

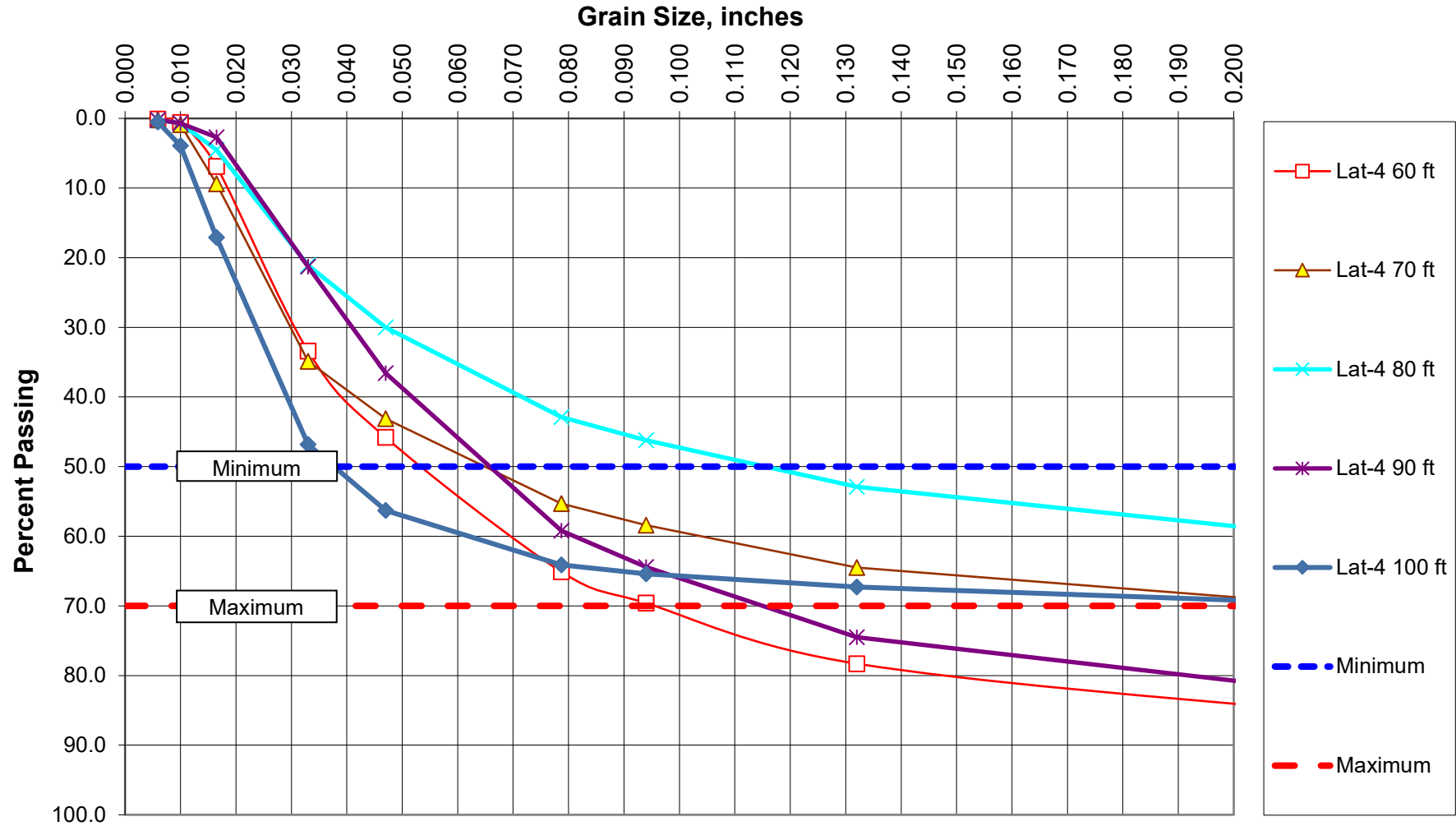
Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	60	slot
20-30	80	slot
30-40	100	slot
40-50	125	slot
50-60	100	slot
60-70	125	slot
70-80	150	slot
80-90	150	slot
90-100	125	slot
100-110	150	slot
110-120	125	slot
120-130	100	slot
130-140	80	slot
140-150	80	slot
150-160	60	slot
160-170	60	slot
170-180	50	slot
180-190	60	slot
190-200	50	slot
200-210	30	slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	1	10
40	0	0
50	2	20
60	4	40
80	3	30
100	3	30
125	4	40
150	3	30
Total	21	210

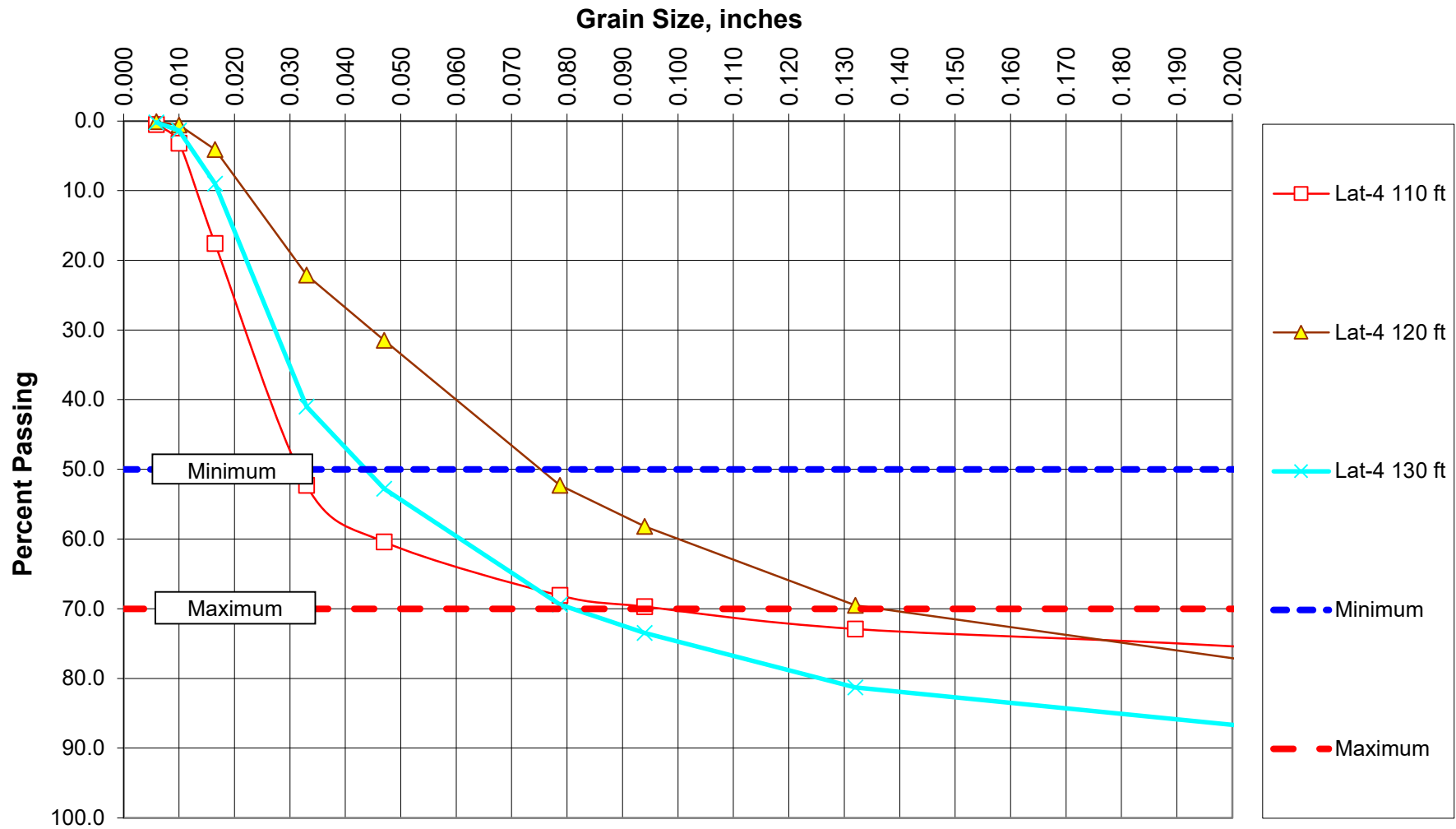
**Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 4**



**Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 4**



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 4



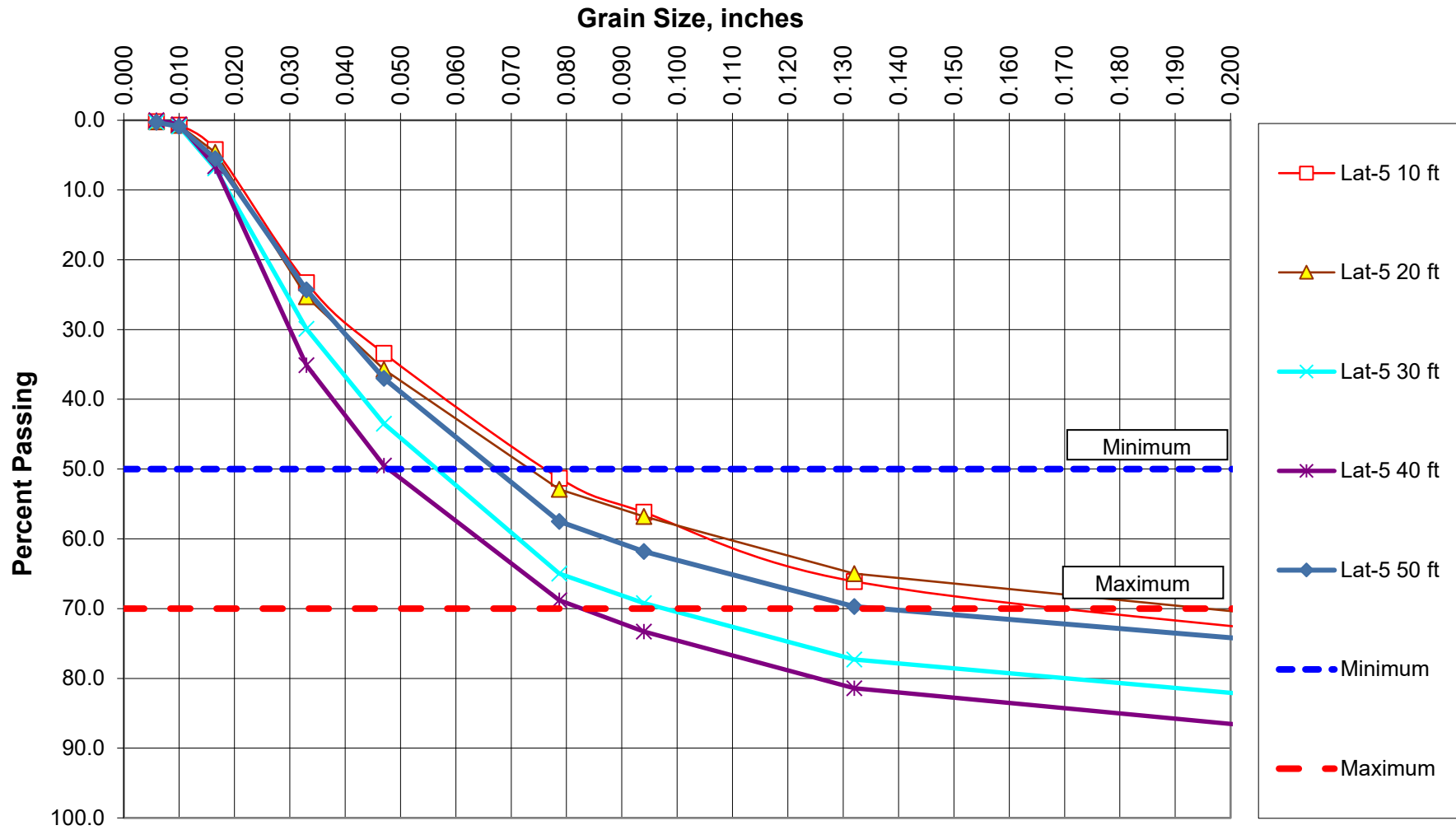
Collector Well
Recommended Screen Slot Distribution

Client:	Sioux Falls, SD	
Well ID:	Collector Well 72	
Lateral Number:	4	
Lateral Length:	130	feet
Screen Length:	120	feet
Date Completed:	1/5/2022	

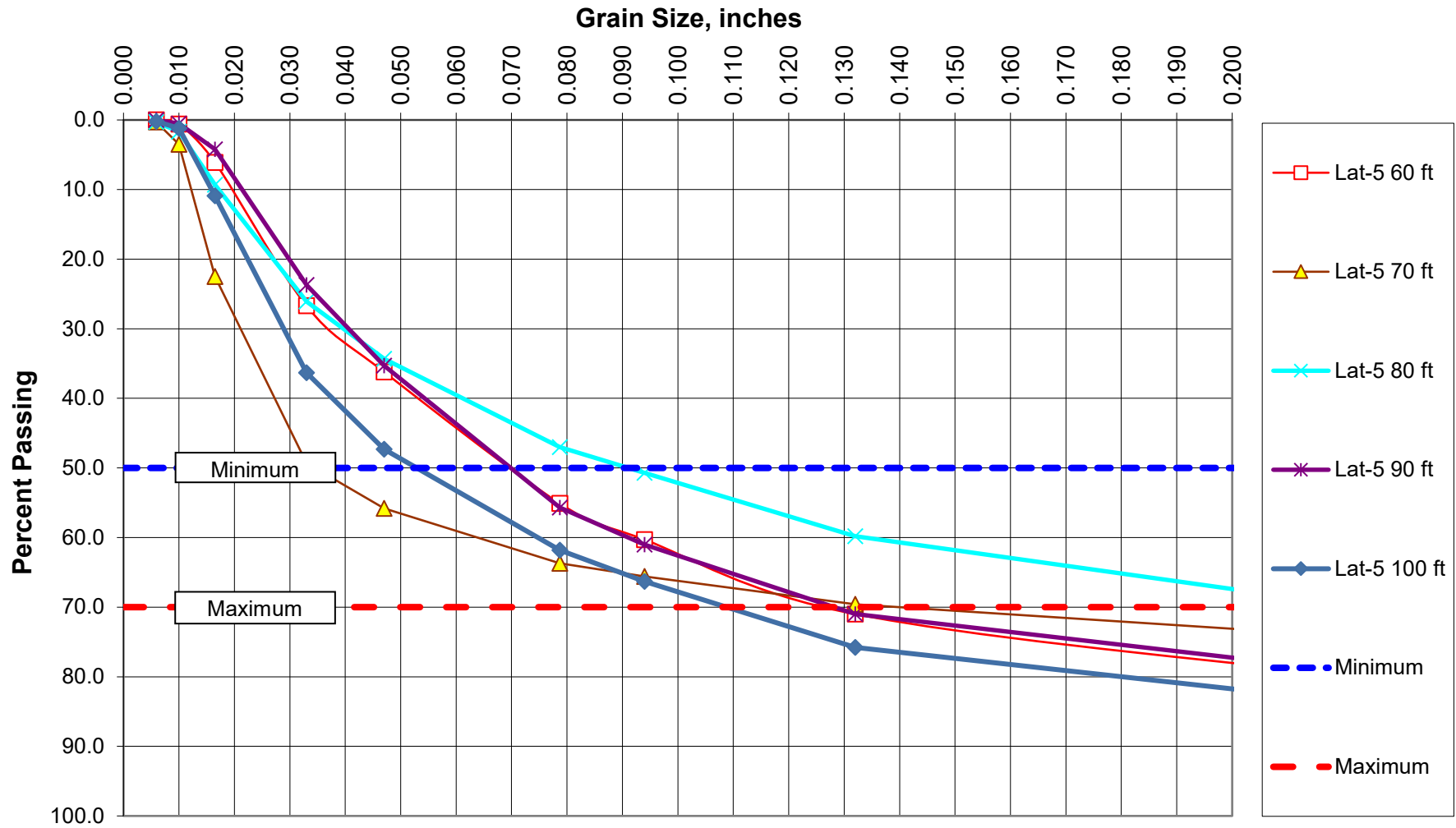
Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	50	slot
20-30	80	slot
30-40	100	slot
40-50	60	slot
50-60	50	slot
60-70	60	slot
70-80	100	slot
80-90	125	slot
90-100	100	slot
100-110	80	slot
110-120	60	slot
120-130	60	slot
130-140		slot
140-150		slot
150-160		slot
160-170		slot
170-180		slot
180-190		slot
190-200		slot
200-210		slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	0	0
40	0	0
50	2	20
60	4	40
80	2	20
100	3	30
125	1	10
150	0	0
Total	13	130

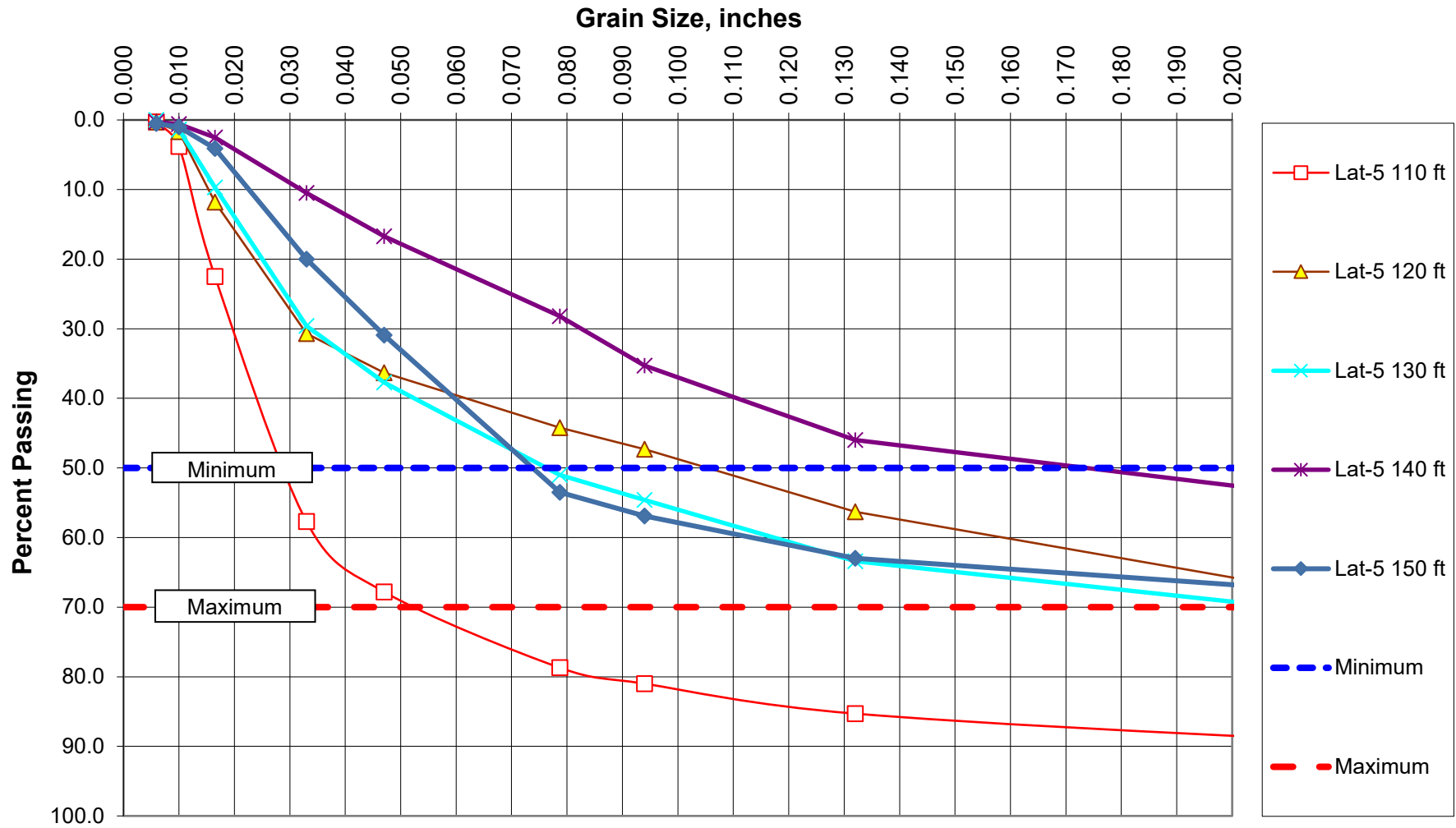
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 5



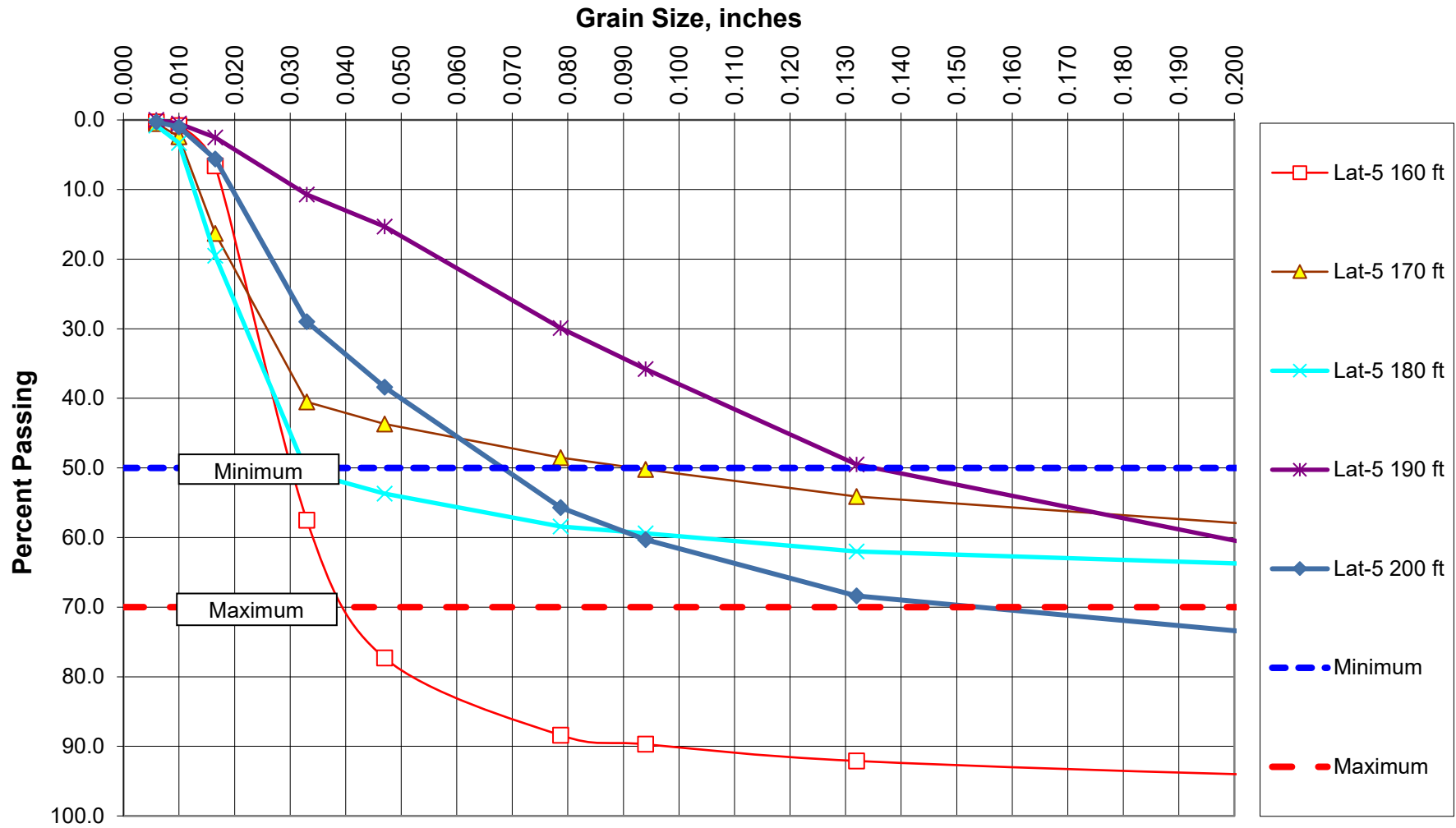
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 5



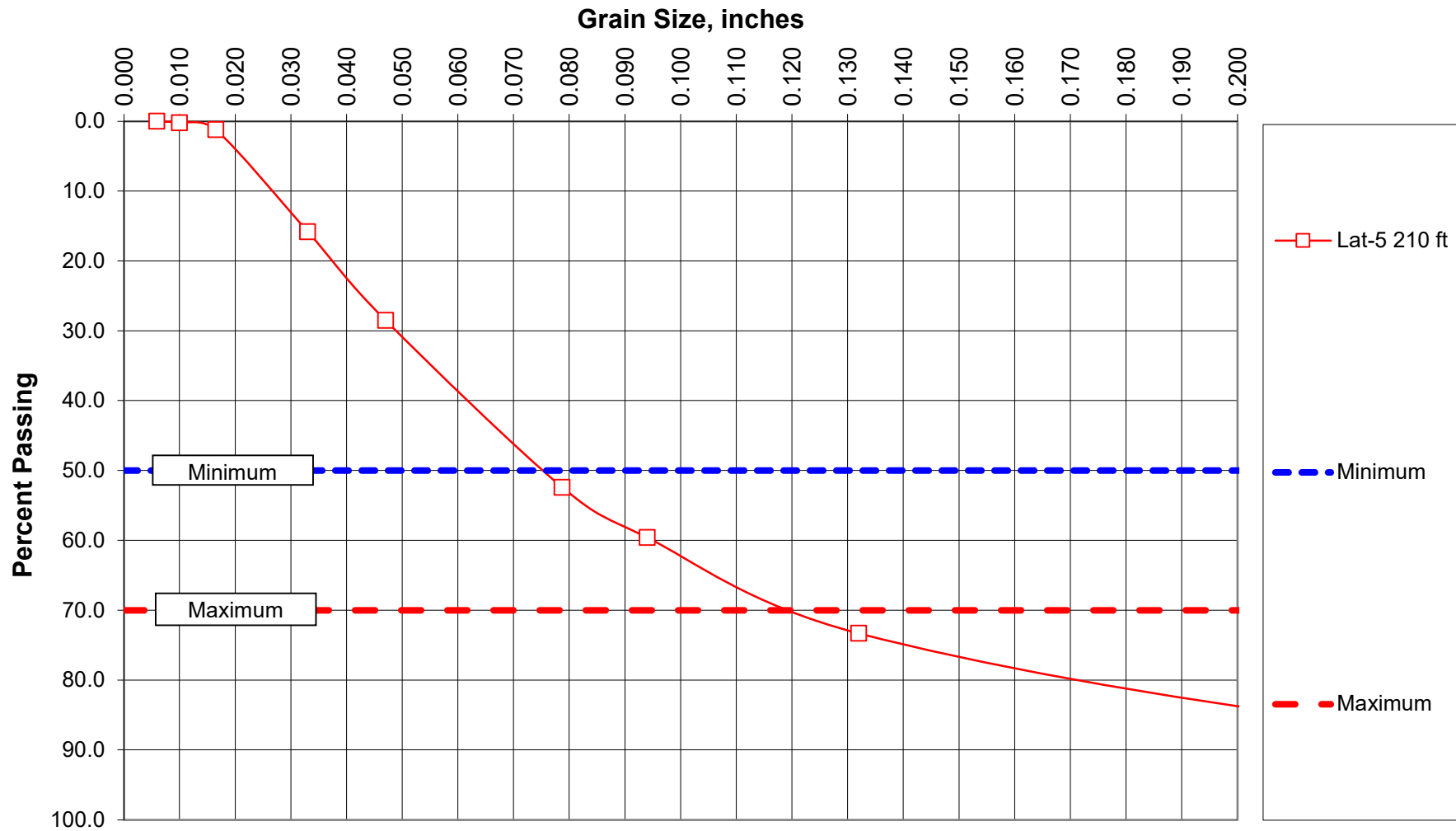
Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 5



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 5



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 5



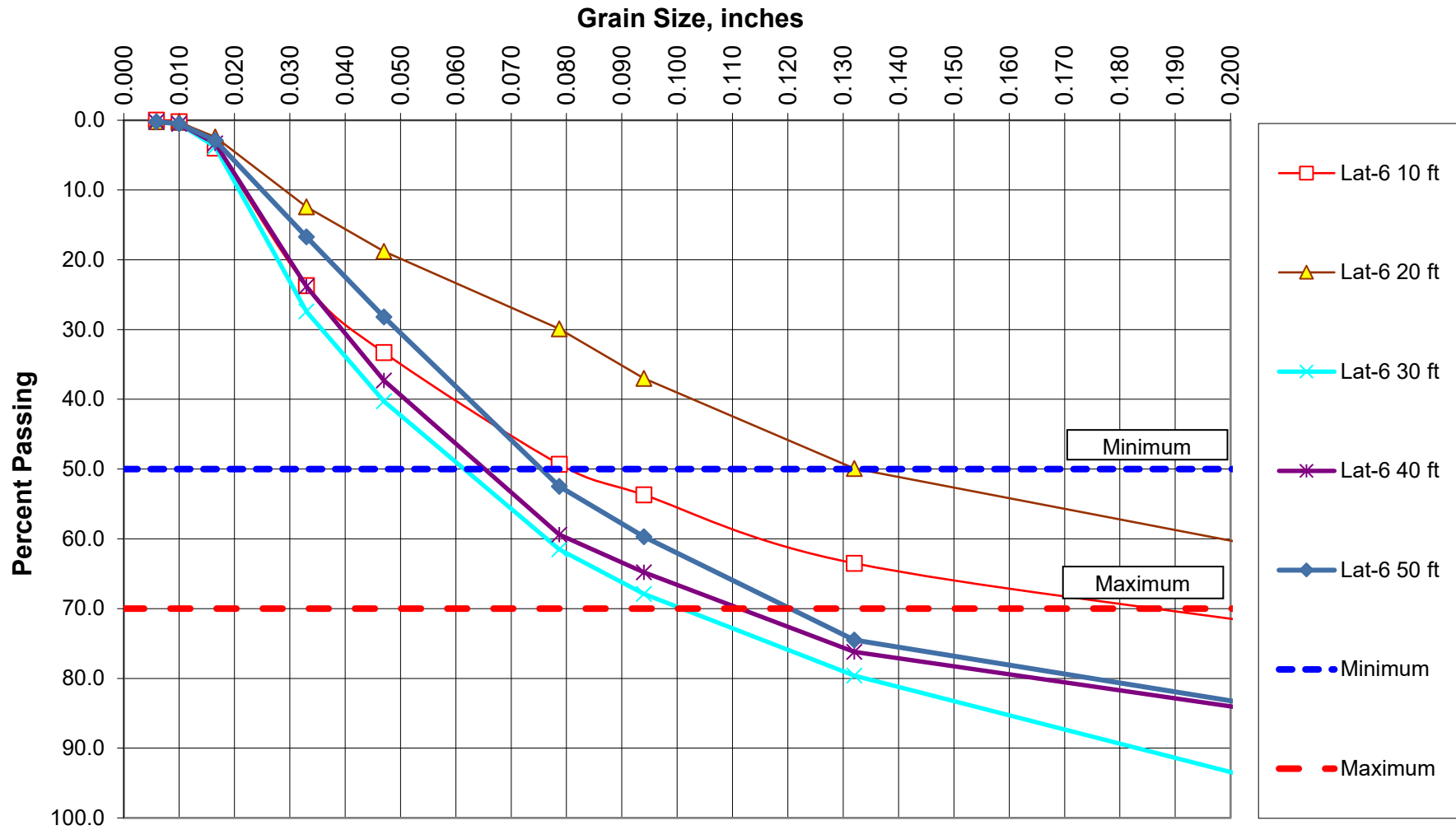
Collector Well
Recommended Screen Slot Distribution

Client:	Sioux Falls, SD	
Well ID:	Collector Well 72	
Lateral Number:	5	
Lateral Length:	210	feet
Screen Length:	200	feet
Date Completed:	1/13/2022	

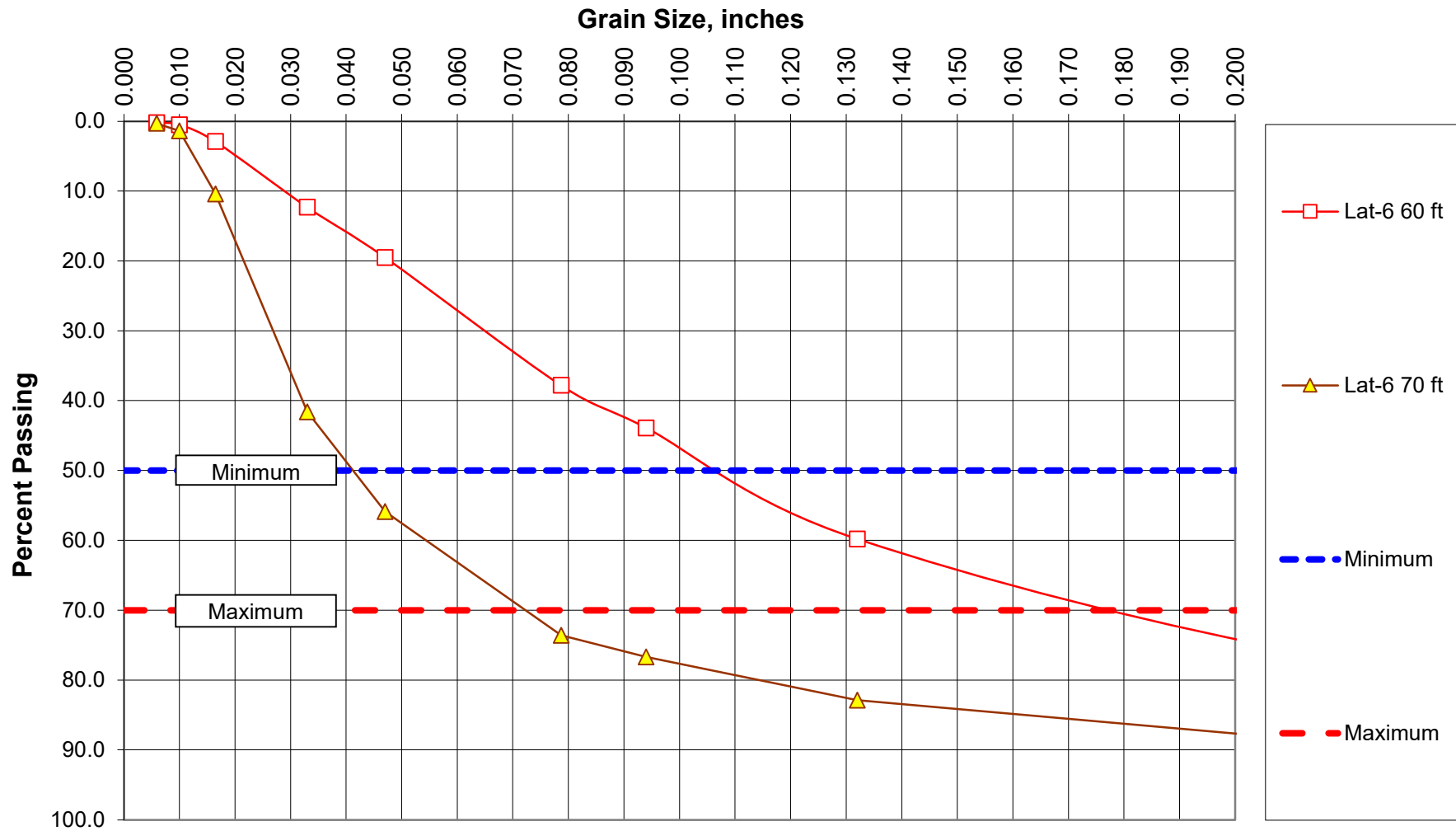
Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	100	slot
20-30	80	slot
30-40	60	slot
40-50	60	slot
50-60	80	slot
60-70	80	slot
70-80	60	slot
80-90	100	slot
90-100	80	slot
100-110	60	slot
110-120	40	slot
120-130	80	slot
130-140	120	slot
140-150	120	slot
150-160	80	slot
160-170	30	slot
170-180	80	slot
180-190	120	slot
190-200	120	slot
200-210	120	slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	1	10
40	1	10
50	0	0
60	4	40
80	7	70
100	2	20
120	5	50
150	0	0
Total	21	210

Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 6



Grain Size Analyses
Sioux Falls, SD
Collector Well 72
Lateral 6



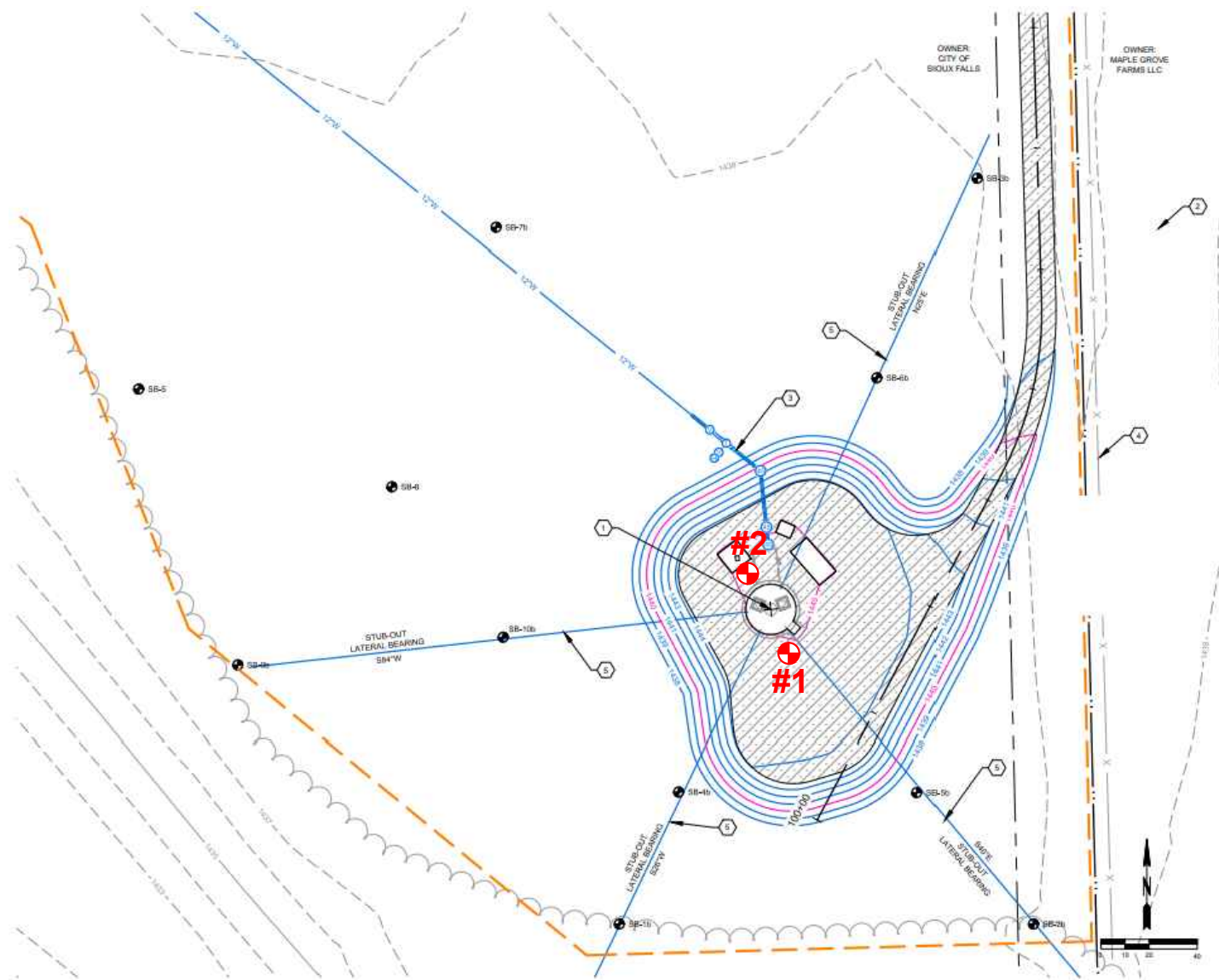
Collector Well

Recommended Screen Slot Distribution

Client:	Sioux Falls, SD	
Well ID:	Collector Well 72	
Lateral Number:	6	
Lateral Length:	70	feet
Screen Length:	60	feet
Date Completed:	1/18/2022	

Screen slot distribution		
Distance from Inside Wall of Caisson (feet)	Screen Slot Size (1000 ^{ths} inch)	
0-10	Blank	
10-20	100	slot
20-30	125	slot
30-40	80	slot
40-50	80	slot
50-60	100	slot
60-70	60	slot
70-80		slot
80-90		slot
90-100		slot
100-110		slot
110-120		slot
120-130		slot
130-140		slot
140-150		slot
150-160		slot
160-170		slot
170-180		slot
180-190		slot
190-200		slot
200-210		slot

Screen Size Utilization		
Screen Slot Size (1000 ^{ths} inch)	Number of 10-foot Section	Length per Slot Size (feet)
Blank	1	10
20	0	0
30	0	0
40	0	0
50	0	0
60	1	10
80	2	20
100	2	20
125	1	10
150	0	0
Total	7	70



•-BORING LOCATION



AMERICAN
ENGINEERING
TESTING, INC.

PROJECT: SUBSURFACE EXPLORATION -
PROPOSED COLLECTOR WELL 72
SIOUX FALLS, SOUTH DAKOTA

SUBJECT: BORING LOCATION MAP

SCALE: NONE

DRAWN BY: ZLH

PROJECT NO.
P-0004044

DATE: 07/12/2021

REVIEWED BY: BWC



AMERICAN
ENGINEERING
TESTING, INC.

SUBSURFACE BORING LOG

AET No: **P-0004044** Log of Boring No. **1 (p. 1 of 1)**
Project: **Collector Well 72; Sioux Falls, South Dakota**

DEPTH IN FEET	Surface Elevation 1442.2' MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	qu
1	FILL, mixture of ORGANIC FAT CLAY and FAT CLAY, black and very dark brown, moist	FILL									
2											
3											
4											
5	FAT CLAY, brownish gray, moist to very moist, firm (CL/CH)	FINE ALLUVIUM	11	M	SS	12					
6											
7			8	M	SS	1					
8											
9	CLAYEY SAND, fine to medium grained, brown, very moist, loose (SC)	MIXED ALLUVIUM									
10			6	▼	SS	16					
11											
12			16	W	SS	14					
13	SAND, fine to medium grained, with gravel, brown, moist to wet to 12.5' then waterbearing, medium dense to loose (SP)	COARSE ALLUVIUM									
14											
15			21	W	SS	12					
16											
17											
18											
19											
20											
21			6	W	SS	10					
22											
23											
24											
25											
26			24	W	SS	14					
27											
28	SAND, fine to medium grained, with gravel, gray, waterbearing, medium dense to dense to medium dense to dense, cobbles at 47' (SP)										
29											
30											
31											
32											
33											
34											
35			14	W	SS	12					
36											
37											
38											
39											
40			49	W	SS	14					
41											
42											
43											
44											
45											
46			44	W	SS	18					
47											
48	SANDY LEAN CLAY, with a little gravel, gray, moist, stiff (CL)	TILL									
49											
50											
51			14	M	SS	18					3200
	END OF BORING										

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-14½'	3.25" HSA								
14½'-49½'	RD w/DM	7/6/21	12:35	16'	14.5'	16'		12.5'	
BORING COMPLETED: 7/6/21									
DR: MH LG: JD Rig: 63									

AET CORP P-0004044.GPJ AET-CPT-WELL_20181012_JG.GDT 7/13/21



AMERICAN
ENGINEERING
TESTING, INC.

SUBSURFACE BORING LOG

AET No: **P-0004044** Log of Boring No. **2 (p. 1 of 1)**
Project: **Collector Well 72; Sioux Falls, South Dakota**

DEPTH IN FEET	Surface Elevation 1442.5' MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS				
							WC	DEN	LL	PL	qu
1	FILL, mixture of ORGANIC FAT CLAY and FAT CLAY, black and very dark brown, moist	FILL									
2											
3											
4											
5											
6	FAT CLAY, very dark brown, very moist, firm (CH)	FINE ALLUVIUM	8	M	SS	8					
7			9	M	SS	14					
8			7		SS	14					
9	FAT CLAY, grayish brown, very moist, stiff to firm (CL/CH)	COARSE ALLUVIUM									
10											
11											
12											
13											
14	SAND, fine to medium grained, with gravel, brown, waterbearing, medium dense (SP)	COARSE ALLUVIUM	11	W	SS	10					
15											
16			21	W	SS	10					
17											
18											
19											
20											
21			14	W	SS	10					
22											
23											
24	SAND, fine to medium grained, with gravel, gray, waterbearing, medium dense to dense (SP)	COARSE ALLUVIUM									
25											
26											
27											
28											
29											
30											
31											
32											
33											
34	SANDY LEAN CLAY, with a little gravel, gray, moist, very stiff, cobbles at 41.5' (CL)	TILL									
35											
36											
37											
38											
39											
40											
41											
42											
43											
44	SANDY LEAN CLAY, with a little gravel, gray, moist, very stiff, cobbles at 41.5' (CL)	TILL									
45											
46											
47											
48											
49											
50											
51											
51	END OF BORING										

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG
		DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL	
0-14½'	3.25" HSA								
14½'-49½'	RD w/DM	7/7/21	12:40	13.5'	12'	13.5'		10.5'	
BORING COMPLETED: 7/7/21									
DR: MH LG: JD Rig: 63									

AET CORP P-0004044.GPJ AET+CPT+WELL_20181012_JG.GDT 7/13/21



WELL 72 – FIELD PUMP INFORMATION

Vertical Turbine Pump

- Manufacturer: Flowserve
- Model: 14EMM – 3 Stage

Electric Motor

- 50 Hp
- Manufacturer: U.S. Motors
- Enclosure: WP-1

Static Water Level

- Soil Surface Elevation = 1,444.9 feet
- Static Water Elevation = 1,430.7 feet
- Depth of static water level from the soil surface = 14.2 feet