MSHA Approval Number: 120M-01.2
120-psi STRATACRETE Plug Seal
Installation Manual

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120 PSI STRATACRETE Plug Seal
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Seal Installation Guidelines for the Strata Plug Seal

1. Mine personnel choose the area where seals will be installed. Seal shall be located at least five (5) feet from the corner of any pillar. If seal is to be located less than 10 feet from the corner of the pillar, the rib will be reinforced by Shotcrete or Gunnite. If this occurs on the inby side of the seal, this will be done prior to seal installation.

2. The chosen areas are measured to ensure the seal dimensions will not exceed dimensions in the approved plan.

3. Professional Engineer inspects and measures the area to ensure that the seal chosen is appropriate for the area. Areas with roof, floor, and or rib fissures are not appropriate for installation of this seal without reinforcement with various means such as bolting, Shotcrete, Gunite, and chemical grouting of the area where the seal will be built.

4. The certified person designated by the mine should verify that the seal is of the correct dimensions. Please see attached table for dimensions.

5. Ensure the area is free from debris, loose material, excessive rock dust, and that the formwork specified is capable of supporting the loads applied. Forms can be of plywood and wood board construction, concrete blocks, or steel panels, to name a few of the types of forms that can be used. The form used will be stated in the approval package submitted by the mine. All forms, regardless of construction, will be adequately supported to withstand the horizontal loads which will be placed upon it.

6. The seal area is cleaned, removing loose materials from the roof, ribs, and floor. Examples of material removed are loose coal and roof, soft or broken floor or fireclay, thick rock or coal dust, and oily residue. Rib, roof, and floor must be deemed competent by the P.E.

7. Any loose material must be removed a minimum of three (3) feet on each side of seal down to competent strata. If a weir is present inby the seal, loose material will be removed between the weir and the seal down to competent strata.

8. The strata at the seal perimeter should be as rough as practically possible and smooth surfaces shall be minimized. Surfaces with roughness less than 1 inch per 4 linear feet must be mechanically roughened to increase the shear resistance at the seal interface. Alternatively, undulations may be cut into the strata to increase the shear resistance along the plane.

9. Metal objects, such as mesh, straps, rails, etc., that extend through the seal, from one side of the roof, rib, or floor to the other shall be removed.

10. A continuous supply of water with pressure adequate to flush grout lines will be available during all times that seals are being poured.

11. Any standing water shall be removed from the seal sites, however damp or wet locations are acceptable. Flowing water will be diverted or pumped from the seal sites.

12. Measure the seal area once more after it is scaled down to competent strata to ensure that the maximum dimensions of the entry do not exceed what is allowed in the seal design. See attached table for dimensions.

13. Deliver materials to the seal area. The certified person designated by the mine shall ensure the materials are as stated in the approval documents. This will include, but not be restricted to the material for the forms, sampling pipes, drainage pipes, valves, roof support supplies, rockdust, tools, etc

14. Any aggregate, if used, shall not be stored directly on the ground unless a sacrificial layer is left undisturbed and admixtures which have been in storage at the project site for longer than 6 months or which have been subject to freezing shall not be used unless they are retested and proven to meet the specified requirements. MEDIUM STRENGTH STRATACRETE may be delivered via mixing truck from a local concrete plant and delivered underground through a borehole(s) near the construction site. If mixed at a concrete plant, Strata representatives will ensure that accurate and repeatable MEDIUM STRENGTH STRATACRETE batches are consistently produced. Concrete blocks, if used, for formwork will be delivered in pallet form.

15. Roof support according to all approved plans will be installed. All inby roof support must be completed before access is blocked.

16. All debris 50 feet inby and outby the seal location will be removed.

17. Build forms according to the plan approved by the local MSHA office. Attached is a drawing of a typical wood form using props for support. Cribbing or other suitable material may also be used for support. The typical sequence of building wood forms is as follows:

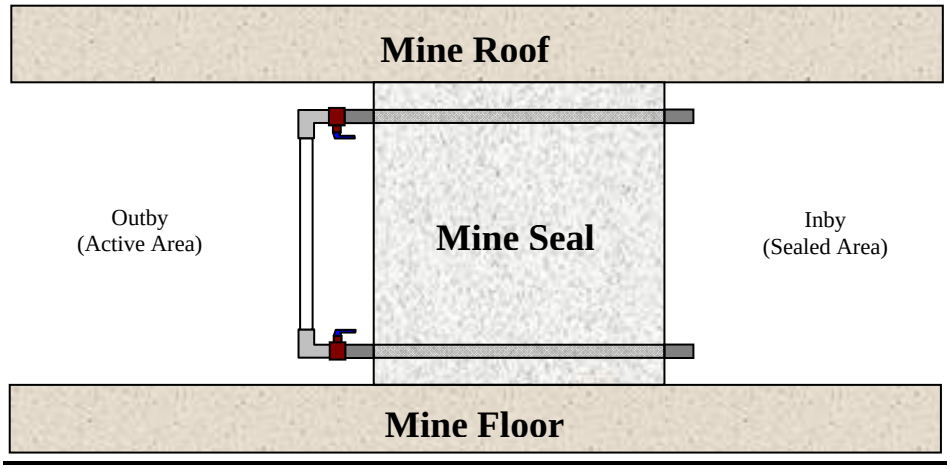
a. Set supports, (roc props, cribs etc.) Supports shall be equally spaced from rib to rib, the first support being no more than three (3) feet from the ribline.
b. Install framing lumber supports to the roc props or cribs, at roof line, floor line and equally spaced between floor and roof. If multiple lengths of framing lumber are used, lumber will be overlapped and fastened together.
c. Fasten plywood (3/4") to the framing lumber to create formwork for the seal from roof to floor and rib to rib.
d. Cut appropriate size holes in the formwork for the gas sampling pipe, water drainage pipe(s), breather pipes, and fill pipes as described below.

18. Install one gas sampling pipe that extends into the center of the first crosscut inby the seal. If an open crosscut does not exist, the sampling pipe shall extend one half the distance of the open entry inby the seal. The sampling pipe shall be approximately 12 inches from the roof, and at least six inches from the roof and ribs, when extending through the seal. The gas sampling tube shall be nominal 1/2-inch inside diameter, 80 non- conductive, non-corrosive pipe with an internal burst pressure of 240 psi. The gas sampling pipes will be supported by hangers or by cribbing.

19. If the new seal is placed on the outby side of an existing seal, non metallic gas sampling pipes rated at 240 psi shall be connected to each sampling pipe in each seal. The new gas sampling pipe will have a 240 psi shutoff valve installed outby the seal. If there is any space between the new and existing seal, that area will also be provided with a sampling pipe of the same specifications.

20. Install drainage pipe(s) as required and determined by the anticipated maximum flow rate at the seal location. The pipes used shall be non-conductive, corrosion resistant, and have an internal burst pressure of 240 psi. Drainage pipes shall be positioned at least three (3) feet from the nearest rib. If more than one drain pipe is installed in a seal, they shall be approximately three (3) feet from the nearest pipe. Pipes shall be installed so the depth of water against the seal is less than 12 inches. The u trap may be recessed into the floor to accomplish this. A maximum of five (5) drainage pipes will be allowed in a seal. Drainage pipe can be between 4 inch and 8 inch nominal inside diameter. If the seal is installed outby an existing seal, drainage pipes as specified above will be added in the appropriate length and connected to the existing water drainage pipe. The water drainage pipe(s) will be placed in the lowest elevation seal(s) in the set. A valve and water trap with an internal burst pressure of 240 psi shall be installed on the outby side of the seal. A low weir(s) or catchment, no more than 12" high, may be constructed across the entry inby all seals with drainage pipes to trap sediment and debris that may clog the drainage pipe(s).

21. Any individual seal with a water drainage system may also incorporate a water height measuring system. If used, this measuring system must be initially built into the seal in a manner that could establish the height of water on the inby side of the seal. A water height measuring system, incorporating a sight tube as shown below, shall consist of two horizontal 1 inch inside diameter non-metallic pipes installed through the seal. One pipe shall be securely installed through the seal at the approximate height of the top of the water trap and the other pipe shall be securely installed through the seal as close to the roof as possible. On the outby side of each pipe, a shut-off valve shall be installed. Each shut-off valve and pipe extending through the seal must have an internal pressure rating of 240 psi. Two 90 degree elbows shall be installed on the outby end of each pipe after the valves are in place. A clear plastic tube shall be securely placed between these elbows for viewing of the water elevation. The elbows and the clear plastic tubing must only have strength that would allow them to perform the functions for which they were installed.



22. Install a minimum of two (2) breather pipes in the highest location in each seal. The diameter will be sufficient to allow the air to vent, and then the pipe will be filled with the MEDIUM STRENGTH STRATACRETE. The vent pipes shall be configured in an L-shape so that the end of the pipe in the seal is positioned vertically and close to the roof. The diameter of the pipe shall be adequate to let the air vent and then the pipe to fill with MEDIUM STRENGTH STRATACRETE. The gap between the roof and the end of the pipe shall be adequate to allow the pipe to fill with MEDIUM STRENGTH STRATACRETE, but as close to the roof as practical to assure that the air is completely evacuated. Valves shall be provided on the filling ports to allow the flow of MEDIUM STRENGTH STRATACRETE to be stopped without the loss of MEDIUM STRENGTH STRATACRETE through the filling port. The filling ports must be completely filled with MEDIUM STRENGTH STRATACRETE when the placement is completed. Caps or valves shall also be provided on the vent pipes so the vent pipe can be

shutoff once the vent pipes are returning concrete. The vent pipes must be filled in the final seal configuration. If the slump of the MEDIUM STRENGTH STRATACRETE is not adequate to flow through the vent pipes, the pipes shall be withdrawn or backfilled with an expansive grout. Where the roof is uneven such that it creates recessed pockets, a vent pipe shall be installed to allow air to evacuate and allow the MEDIUM STRENGTH STRATACRETE to contact the roof. Vent pipes shall also be placed wherever the roof line peaks or crowns.

23. Install fill pipe into the formwork for filling concrete into formwork. Installation of the fill pipe is the final step prior to lining the inside of the formwork with the line curtain. This pipe should be in the top one-third of the form and either near the middle of the seal of if a high void is present in the roof, in that area. Some installations may require more than on fill pipe. The fill pipe shall be equipped with a valve to allow the MEDIUM STRENGTH STRATACRETE to be stopped without the loss of material. The fill pipe must be filled or removed when the placement is complete.

24. Line the inside of the formwork with line curtain, overlapping the roof, floor, and ribs making the formwork as fluid tight as possible.

25. Begin pumping of the MEDIUM STRENGTH STRATACRETE material. A variety of concrete pumps can be used for the seal installation. The type of pump will depend on the distance the material will be pumped. An in-line booster pump is acceptable in excessively long pumping distances. The type of booster pump needed will depend on whether the booster pump is located in the intake or return side of the mine's ventilation system. The MEDIUM STRENGTH STRATACRETE material is a very high slump material and does not require vibration. The material from each batch will be tested using a spread test. A three (3) inch diameter by three (3) inch high cylinder of the material will be taken from the batch. The cylinder is emptied onto a flat surface. To ensure pumpability, the material should spread to a circle of at least six (6) inches. If material does not meet the spread test, a plasticizer may be added to the truck according to the plasticizer manufacturer's recommendation. If the spread is greater than 16 inches, the material will be tested again. If subsequent tests are still greater than 16 inches, the truck shall be rejected.

26. Pumping can be done from the surface, using bulk concrete trucks or pumped from underground using pre-packaged material.

27. The STRATACRETE may be poured in multiple lifts or in a continuous pour. When the seal is placed in multiple lifts, the time between lifts must be adequate to allow the MEDIUM STRENGTH STRATACRETE to attain adequate strength to support the next lift. The time will be a minimum of four (4) hours. The material will be supplied at a rate to prevent cold joints in any placement. However, in the event a cold joint is unavoidable, the hardened surface shall be scarified, and

loose material shall be removed to ensure that the lifts are adequately engaged. This will be done through doors or windows in the formwork.

28. Take samples as specified in the approved plan. The samples will be collected in three (3) inch diameter by six (6) inch tall cylinders. A minimum of two sets of samples containing seven (7) cylinders each will be taken from each seal site and field cured for seven days at the seal site. Three (3) field cured samples from each set will be tested at seven (7) days. The remaining samples are to be held in reserve in the event the first three (3) samples do not achieve design strength. The design strength is 3,000 psi in a uniaxial compression test. The minimum compressive strength of any one sample shall be 3,600 psi with the average of 4,200 psi for all samples.

29. Once material is “roofed” and concrete is exiting the vent pipes, cap pipes to prevent excessive material from leaking out the pipes.

30. After pumping is completed, check the sealed area for any air leakage. If there is loss of contact between the seal and the roof, or ribs, the voids shall be filled with a non-shrinking cementitious or epoxy grout, with shear strength equivalent to the shear strength of the MEDIUM STRENGTH STRATACRETE, according to the approved plan.

31. The formwork shall stay in place for a minimum of seven (7) days to allow for proper curing. Formwork can stay on the seals indefinitely. If the formwork is removed, repair any spalling caused by form removal with a non-shrinking cementitious or epoxy grout with shear strength equivalent to the MEDIUM STRENGTH STRATACRETE. An MSHA approved sealant may be applied after form removal.

32. If shrinkage is encountered that causes the seal to not contact the roof or ribs, grout will be injected in the voids. Grout will be either cementitious or two-part polyurethane.

33. Installation guidelines are considered “typical.” Site specific conditions may require minor changes to the installation. All changes will be certified by the Professional Engineer overseeing the installation.

34. The maximum allowable convergence that this seal design can withstand before structural integrity of the seal is compromised is up to 0.26 inches, dependent on the height of the seal. This is the physical convergence of the seal, and not the surrounding strata. The seal remains elastic if the maximum allowable convergence is not exceeded and continues to fulfill its designed purpose. Pins may be installed in the center of the face of the seal for measurements to be taken. “Pogo” sticks or other acceptable measuring devices can be used in lieu of this.

35. Seals will be examined for convergence every six months. If visible convergence is seen in the area, the area will be examined to see if maximum convergence is exceeded in the seal. If after one year, maximum convergence is not exceeded, examinations will be made on a yearly basis unless convergence in excess of maximum is suspected. If convergence is suspected, a P.E. must be immediately contacted to evaluate the effects of the convergence. The P.E. will certify the structural integrity of the seal or determine the proper repairs and submit that information to the MSHA District.

Seal Design Table – 120 psi MEDIUM STRENGTH STRATACRETE Plug Seal

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
1	16	16.0	13	7	120	3000	115	2	1.5
2	16	15.5	13	2	120	3000	115	2	1.5
3	16	15.0	12	9	120	3000	115	2	1.5
4	16	14.5	12	4	120	3000	115	2	1.5
5	16	14.0	11	11	120	3000	115	2	1.5
6	16	13.5	11	6	120	3000	115	2	1.5
7	16	13.0	11	2	120	3000	115	2	1.5
8	16	12.5	11	0	120	3000	115	2	1.5
9	16	12.0	10	8	120	3000	115	2	1.5
10	16	11.5	10	6	120	3000	115	2	1.5
11	16	11.0	10	2	120	3000	115	2	1.5
12	16	10.5	9	11	120	3000	115	2	1.5
13	16	10.0	9	7	120	3000	115	2	1.5
14	16	9.5	9	4	120	3000	115	2	1.5
15	16	9.0	9	0	120	3000	115	2	1.5
16	16	8.5	8	8	120	3000	115	2	1.5
17	16	8.0	8	4	120	3000	115	2	1.5
18	16	7.5	8	0	120	3000	115	2	1.5
19	16	7.0	7	7	120	3000	115	2	1.5
20	16	6.5	7	2	120	3000	115	2	1.5
21	16	6.0	6	10	120	3000	115	2	1.5
22	16	5.5	6	5	120	3000	115	2	1.5
23	16	5.0	6	0	120	3000	115	2	1.5
24	16	4.5	5	6	120	3000	115	2	1.5
25	16	4.0	5	0	120	3000	115	2	1.5
26	16	3.5	4	6	120	3000	115	2	1.5
27	16	3.0	4	0	120	3000	115	2	1.5
28	16	2.5	3	5	120	3000	115	2	1.5
29	17	16.0	13	7	120	3000	115	2	1.5
30	17	15.5	13	2	120	3000	115	2	1.5
31	17	15.0	12	9	120	3000	115	2	1.5
32	17	14.5	12	4	120	3000	115	2	1.5
33	17	14.0	12	0	120	3000	115	2	1.5
34	17	13.5	11	10	120	3000	115	2	1.5
35	17	13.0	11	6	120	3000	115	2	1.5
36	17	12.5	11	4	120	3000	115	2	1.5
37	17	12.0	11	0	120	3000	115	2	1.5
38	17	11.5	10	8	120	3000	115	2	1.5
39	17	11.0	10	6	120	3000	115	2	1.5
40	17	10.5	10	2	120	3000	115	2	1.5
41	17	10.0	9	11	120	3000	115	2	1.5
42	17	9.5	9	6	120	3000	115	2	1.5
43	17	9.0	9	2	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
44	17	8.5	8	11	120	3000	115	2	1.5
45	17	8.0	8	6	120	3000	115	2	1.5
46	17	7.5	8	1	120	3000	115	2	1.5
47	17	7.0	7	10	120	3000	115	2	1.5
48	17	6.5	7	5	120	3000	115	2	1.5
49	17	6.0	6	11	120	3000	115	2	1.5
50	17	5.5	6	6	120	3000	115	2	1.5
51	17	5.0	6	0	120	3000	115	2	1.5
52	17	4.5	5	7	120	3000	115	2	1.5
53	17	4.0	5	1	120	3000	115	2	1.5
54	17	3.5	4	6	120	3000	115	2	1.5
55	17	3.0	4	0	120	3000	115	2	1.5
56	17	2.5	3	5	120	3000	115	2	1.5
57	18	16.0	13	7	120	3000	115	2	1.5
58	18	15.5	13	2	120	3000	115	2	1.5
59	18	15.0	12	10	120	3000	115	2	1.5
60	18	14.5	12	7	120	3000	115	2	1.5
61	18	14.0	12	4	120	3000	115	2	1.5
62	18	13.5	12	1	120	3000	115	2	1.5
63	18	13.0	11	10	120	3000	115	2	1.5
64	18	12.5	11	6	120	3000	115	2	1.5
65	18	12.0	11	4	120	3000	115	2	1.5
66	18	11.5	11	0	120	3000	115	2	1.5
67	18	11.0	10	8	120	3000	115	2	1.5
68	18	10.5	10	5	120	3000	115	2	1.5
69	18	10.0	10	1	120	3000	115	2	1.5
70	18	9.5	9	8	120	3000	115	2	1.5
71	18	9.0	9	5	120	3000	115	2	1.5
72	18	8.5	9	0	120	3000	115	2	1.5
73	18	8.0	8	8	120	3000	115	2	1.5
74	18	7.5	8	4	120	3000	115	2	1.5
75	18	7.0	7	11	120	3000	115	2	1.5
76	18	6.5	7	6	120	3000	115	2	1.5
77	18	6.0	7	0	120	3000	115	2	1.5
78	18	5.5	6	7	120	3000	115	2	1.5
79	18	5.0	6	1	120	3000	115	2	1.5
80	18	4.5	5	7	120	3000	115	2	1.5
81	18	4.0	5	1	120	3000	115	2	1.5
82	18	3.5	4	7	120	3000	115	2	1.5
83	18	3.0	4	0	120	3000	115	2	1.5
84	18	2.5	3	5	120	3000	115	2	1.5
85	19	16.0	13	7	120	3000	115	2	1.5
86	19	15.5	13	5	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
87	19	15.0	13	1	120	3000	115	2	1.5
88	19	14.5	12	11	120	3000	115	2	1.5
89	19	14.0	12	7	120	3000	115	2	1.5
90	19	13.5	12	5	120	3000	115	2	1.5
91	19	13.0	12	1	120	3000	115	2	1.5
92	19	12.5	11	10	120	3000	115	2	1.5
93	19	12.0	11	6	120	3000	115	2	1.5
94	19	11.5	11	2	120	3000	115	2	1.5
95	19	11.0	10	11	120	3000	115	2	1.5
96	19	10.5	10	7	120	3000	115	2	1.5
97	19	10.0	10	4	120	3000	115	2	1.5
98	19	9.5	9	11	120	3000	115	2	1.5
99	19	9.0	9	7	120	3000	115	2	1.5
100	19	8.5	9	2	120	3000	115	2	1.5
101	19	8.0	8	10	120	3000	115	2	1.5
102	19	7.5	8	5	120	3000	115	2	1.5
103	19	7.0	8	0	120	3000	115	2	1.5
104	19	6.5	7	7	120	3000	115	2	1.5
105	19	6.0	7	1	120	3000	115	2	1.5
106	19	5.5	6	8	120	3000	115	2	1.5
107	19	5.0	6	2	120	3000	115	2	1.5
108	19	4.5	5	8	120	3000	115	2	1.5
109	19	4.0	5	2	120	3000	115	2	1.5
110	19	3.5	4	7	120	3000	115	2	1.5
111	19	3.0	4	1	120	3000	115	2	1.5
112	19	2.5	3	6	120	3000	115	2	1.5
113	20	16.0	13	11	120	3000	115	2	1.5
114	20	15.5	13	8	120	3000	115	2	1.5
115	20	15.0	13	5	120	3000	115	2	1.5
116	20	14.5	13	2	120	3000	115	2	1.5
117	20	14.0	12	11	120	3000	115	2	1.5
118	20	13.5	12	7	120	3000	115	2	1.5
119	20	13.0	12	4	120	3000	115	2	1.5
120	20	12.5	12	0	120	3000	115	2	1.5
121	20	12.0	11	8	120	3000	115	2	1.5
122	20	11.5	11	5	120	3000	115	2	1.5
123	20	11.0	11	1	120	3000	115	2	1.5
124	20	10.5	10	10	120	3000	115	2	1.5
125	20	10.0	10	5	120	3000	115	2	1.5
126	20	9.5	10	1	120	3000	115	2	1.5
127	20	9.0	9	8	120	3000	115	2	1.5
128	20	8.5	9	4	120	3000	115	2	1.5
129	20	8.0	8	11	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
130	20	7.5	8	6	120	3000	115	2	1.5
131	20	7.0	8	1	120	3000	115	2	1.5
132	20	6.5	7	8	120	3000	115	2	1.5
133	20	6.0	7	2	120	3000	115	2	1.5
134	20	5.5	6	10	120	3000	115	2	1.5
135	20	5.0	6	4	120	3000	115	2	1.5
136	20	4.5	5	8	120	3000	115	2	1.5
137	20	4.0	5	2	120	3000	115	2	1.5
138	20	3.5	4	8	120	3000	115	2	1.5
139	20	3.0	4	1	120	3000	115	2	1.5
140	20	2.5	3	6	120	3000	115	2	1.5
141	21	16.0	14	2	120	3000	115	2	1.5
142	21	15.5	14	0	120	3000	115	2	1.5
143	21	15.0	13	8	120	3000	115	2	1.5
144	21	14.5	13	5	120	3000	115	2	1.5
145	21	14.0	13	1	120	3000	115	2	1.5
146	21	13.5	12	11	120	3000	115	2	1.5
147	21	13.0	12	7	120	3000	115	2	1.5
148	21	12.5	12	4	120	3000	115	2	1.5
149	21	12.0	12	0	120	3000	115	2	1.5
150	21	11.5	11	7	120	3000	115	2	1.5
151	21	11.0	11	4	120	3000	115	2	1.5
152	21	10.5	11	0	120	3000	115	2	1.5
153	21	10.0	10	7	120	3000	115	2	1.5
154	21	9.5	10	2	120	3000	115	2	1.5
155	21	9.0	9	11	120	3000	115	2	1.5
156	21	8.5	9	6	120	3000	115	2	1.5
157	21	8.0	9	1	120	3000	115	2	1.5
158	21	7.5	8	7	120	3000	115	2	1.5
159	21	7.0	8	2	120	3000	115	2	1.5
160	21	6.5	7	10	120	3000	115	2	1.5
161	21	6.0	7	4	120	3000	115	2	1.5
162	21	5.5	6	10	120	3000	115	2	1.5
163	21	5.0	6	4	120	3000	115	2	1.5
164	21	4.5	5	10	120	3000	115	2	1.5
165	21	4.0	5	4	120	3000	115	2	1.5
166	21	3.5	4	8	120	3000	115	2	1.5
167	21	3.0	4	1	120	3000	115	2	1.5
168	21	2.5	3	6	120	3000	115	2	1.5
169	22	16.0	14	6	120	3000	115	2	1.5
170	22	15.5	14	2	120	3000	115	2	1.5
171	22	15.0	14	0	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
172	22	14.5	13	8	120	3000	115	2	1.5
173	22	14.0	13	5	120	3000	115	2	1.5
174	22	13.5	13	1	120	3000	115	2	1.5
175	22	13.0	12	10	120	3000	115	2	1.5
176	22	12.5	12	6	120	3000	115	2	1.5
177	22	12.0	12	2	120	3000	115	2	1.5
178	22	11.5	11	10	120	3000	115	2	1.5
179	22	11.0	11	6	120	3000	115	2	1.5
180	22	10.5	11	1	120	3000	115	2	1.5
181	22	10.0	10	10	120	3000	115	2	1.5
182	22	9.5	10	5	120	3000	115	2	1.5
183	22	9.0	10	0	120	3000	115	2	1.5
184	22	8.5	9	7	120	3000	115	2	1.5
185	22	8.0	9	2	120	3000	115	2	1.5
186	22	7.5	8	10	120	3000	115	2	1.5
187	22	7.0	8	4	120	3000	115	2	1.5
188	22	6.5	7	11	120	3000	115	2	1.5
189	22	6.0	7	5	120	3000	115	2	1.5
190	22	5.5	6	11	120	3000	115	2	1.5
191	22	5.0	6	5	120	3000	115	2	1.5
192	22	4.5	5	10	120	3000	115	2	1.5
193	22	4.0	5	4	120	3000	115	2	1.5
194	22	3.5	4	8	120	3000	115	2	1.5
195	22	3.0	4	1	120	3000	115	2	1.5
196	22	2.5	3	6	120	3000	115	2	1.5
197	23	16.0	14	10	120	3000	115	2	1.5
198	23	15.5	14	6	120	3000	115	2	1.5
199	23	15.0	14	2	120	3000	115	2	1.5
200	23	14.5	13	11	120	3000	115	2	1.5
201	23	14.0	13	7	120	3000	115	2	1.5
202	23	13.5	13	4	120	3000	115	2	1.5
203	23	13.0	13	0	120	3000	115	2	1.5
204	23	12.5	12	8	120	3000	115	2	1.5
205	23	12.0	12	4	120	3000	115	2	1.5
206	23	11.5	12	0	120	3000	115	2	1.5
207	23	11.0	11	7	120	3000	115	2	1.5
208	23	10.5	11	4	120	3000	115	2	1.5
209	23	10.0	10	11	120	3000	115	2	1.5
210	23	9.5	10	6	120	3000	115	2	1.5
211	23	9.0	10	1	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
212	23	8.5	9	8	120	3000	115	2	1.5
213	23	8.0	9	4	120	3000	115	2	1.5
214	23	7.5	8	11	120	3000	115	2	1.5
215	23	7.0	8	5	120	3000	115	2	1.5
216	23	6.5	7	11	120	3000	115	2	1.5
217	23	6.0	7	5	120	3000	115	2	1.5
218	23	5.5	6	11	120	3000	115	2	1.5
219	23	5.0	6	5	120	3000	115	2	1.5
220	23	4.5	5	11	120	3000	115	2	1.5
221	23	4.0	5	4	120	3000	115	2	1.5
222	23	3.5	4	10	120	3000	115	2	1.5
223	23	3.0	4	2	120	3000	115	2	1.5
224	23	2.5	3	6	120	3000	115	2	1.5
225	24	16.0	15	0	120	3000	115	2	1.5
226	24	15.5	14	8	120	3000	115	2	1.5
227	24	15.0	14	5	120	3000	115	2	1.5
228	24	14.5	14	1	120	3000	115	2	1.5
229	24	14.0	13	10	120	3000	115	2	1.5
230	24	13.5	13	6	120	3000	115	2	1.5
231	24	13.0	13	2	120	3000	115	2	1.5
232	24	12.5	12	11	120	3000	115	2	1.5
233	24	12.0	12	6	120	3000	115	2	1.5
234	24	11.5	12	2	120	3000	115	2	1.5
235	24	11.0	11	10	120	3000	115	2	1.5
236	24	10.5	11	5	120	3000	115	2	1.5
237	24	10.0	11	0	120	3000	115	2	1.5
238	24	9.5	10	8	120	3000	115	2	1.5
239	24	9.0	10	2	120	3000	115	2	1.5
240	24	8.5	9	10	120	3000	115	2	1.5
241	24	8.0	9	5	120	3000	115	2	1.5
242	24	7.5	8	11	120	3000	115	2	1.5
243	24	7.0	8	6	120	3000	115	2	1.5
244	24	6.5	8	0	120	3000	115	2	1.5
245	24	6.0	7	6	120	3000	115	2	1.5
246	24	5.5	7	0	120	3000	115	2	1.5
247	24	5.0	6	6	120	3000	115	2	1.5
248	24	4.5	5	11	120	3000	115	2	1.5
249	24	4.0	5	5	120	3000	115	2	1.5
250	24	3.5	4	10	120	3000	115	2	1.5
251	24	3.0	4	2	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
252	24	2.5	3	6	120	3000	115	2	1.5
253	25	16.0	15	4	120	3000	115	2	1.5
254	25	15.5	15	0	120	3000	115	2	1.5
255	25	15.0	14	8	120	3000	115	2	1.5
256	25	14.5	14	5	120	3000	115	2	1.5
257	25	14.0	14	0	120	3000	115	2	1.5
258	25	13.5	13	8	120	3000	115	2	1.5
259	25	13.0	13	5	120	3000	115	2	1.5
260	25	12.5	13	0	120	3000	115	2	1.5
261	25	12.0	12	8	120	3000	115	2	1.5
262	25	11.5	12	4	120	3000	115	2	1.5
263	25	11.0	12	0	120	3000	115	2	1.5
264	25	10.5	11	7	120	3000	115	2	1.5
265	25	10.0	11	2	120	3000	115	2	1.5
266	25	9.5	10	10	120	3000	115	2	1.5
267	25	9.0	10	5	120	3000	115	2	1.5
268	25	8.5	9	11	120	3000	115	2	1.5
269	25	8.0	9	6	120	3000	115	2	1.5
270	25	7.5	9	0	120	3000	115	2	1.5
271	25	7.0	8	7	120	3000	115	2	1.5
272	25	6.5	8	1	120	3000	115	2	1.5
273	25	6.0	7	7	120	3000	115	2	1.5
274	25	5.5	7	1	120	3000	115	2	1.5
275	25	5.0	6	6	120	3000	115	2	1.5
276	25	4.5	6	0	120	3000	115	2	1.5
277	25	4.0	5	5	120	3000	115	2	1.5
278	25	3.5	4	10	120	3000	115	2	1.5
279	25	3.0	4	2	120	3000	115	2	1.5
280	25	2.5	3	7	120	3000	115	2	1.5
281	26	16.0	15	6	120	3000	115	2	1.5
282	26	15.5	15	2	120	3000	115	2	1.5
283	26	15.0	14	11	120	3000	115	2	1.5
284	26	14.5	14	7	120	3000	115	2	1.5
285	26	14.0	14	2	120	3000	115	2	1.5
286	26	13.5	13	11	120	3000	115	2	1.5
287	26	13.0	13	7	120	3000	115	2	1.5
288	26	12.5	13	2	120	3000	115	2	1.5
289	26	12.0	12	11	120	3000	115	2	1.5
290	26	11.5	12	6	120	3000	115	2	1.5
291	26	11.0	12	1	120	3000	115	2	1.5
292	26	10.5	11	8	120	3000	115	2	1.5
293	26	10.0	11	4	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
294	26	9.5	10	11	120	3000	115	2	1.5
295	26	9.0	10	6	120	3000	115	2	1.5
296	26	8.5	10	0	120	3000	115	2	1.5
297	26	8.0	9	7	120	3000	115	2	1.5
298	26	7.5	9	1	120	3000	115	2	1.5
299	26	7.0	8	7	120	3000	115	2	1.5
300	26	6.5	8	1	120	3000	115	2	1.5
301	26	6.0	7	7	120	3000	115	2	1.5
302	26	5.5	7	1	120	3000	115	2	1.5
303	26	5.0	6	7	120	3000	115	2	1.5
304	26	4.5	6	0	120	3000	115	2	1.5
305	26	4.0	5	5	120	3000	115	2	1.5
306	26	3.5	4	10	120	3000	115	2	1.5
307	26	3.0	4	2	120	3000	115	2	1.5
308	26	2.5	3	7	120	3000	115	2	1.5
309	27	16.0	15	8	120	3000	115	2	1.5
310	27	15.5	15	5	120	3000	115	2	1.5
311	27	15.0	15	1	120	3000	115	2	1.5
312	27	14.5	14	10	120	3000	115	2	1.5
313	27	14.0	14	5	120	3000	115	2	1.5
314	27	13.5	14	1	120	3000	115	2	1.5
315	27	13.0	13	8	120	3000	115	2	1.5
316	27	12.5	13	5	120	3000	115	2	1.5
317	27	12.0	13	0	120	3000	115	2	1.5
318	27	11.5	12	7	120	3000	115	2	1.5
319	27	11.0	12	2	120	3000	115	2	1.5
320	27	10.5	11	10	120	3000	115	2	1.5
321	27	10.0	11	5	120	3000	115	2	1.5
322	27	9.5	11	0	120	3000	115	2	1.5
323	27	9.0	10	7	120	3000	115	2	1.5
324	27	8.5	10	1	120	3000	115	2	1.5
325	27	8.0	9	8	120	3000	115	2	1.5
326	27	7.5	9	2	120	3000	115	2	1.5
327	27	7.0	8	8	120	3000	115	2	1.5
328	27	6.5	8	2	120	3000	115	2	1.5
329	27	6.0	7	8	120	3000	115	2	1.5
330	27	5.5	7	2	120	3000	115	2	1.5
331	27	5.0	6	7	120	3000	115	2	1.5
332	27	4.5	6	0	120	3000	115	2	1.5
333	27	4.0	5	6	120	3000	115	2	1.5
334	27	3.5	4	10	120	3000	115	2	1.5
335	27	3.0	4	2	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
336	27	2.5	3	7	120	3000	115	2	1.5
337	28	16.0	15	11	120	3000	115	2	1.5
338	28	15.5	15	7	120	3000	115	2	1.5
339	28	15.0	15	4	120	3000	115	2	1.5
340	28	14.5	15	0	120	3000	115	2	1.5
341	28	14.0	14	7	120	3000	115	2	1.5
342	28	13.5	14	4	120	3000	115	2	1.5
343	28	13.0	13	11	120	3000	115	2	1.5
344	28	12.5	13	6	120	3000	115	2	1.5
345	28	12.0	13	1	120	3000	115	2	1.5
346	28	11.5	12	10	120	3000	115	2	1.5
347	28	11.0	12	5	120	3000	115	2	1.5
348	28	10.5	12	0	120	3000	115	2	1.5
349	28	10.0	11	6	120	3000	115	2	1.5
350	28	9.5	11	1	120	3000	115	2	1.5
351	28	9.0	10	8	120	3000	115	2	1.5
352	28	8.5	10	2	120	3000	115	2	1.5
353	28	8.0	9	8	120	3000	115	2	1.5
354	28	7.5	9	4	120	3000	115	2	1.5
355	28	7.0	8	10	120	3000	115	2	1.5
356	28	6.5	8	4	120	3000	115	2	1.5
357	28	6.0	7	8	120	3000	115	2	1.5
358	28	5.5	7	2	120	3000	115	2	1.5
359	28	5.0	6	7	120	3000	115	2	1.5
360	28	4.5	6	1	120	3000	115	2	1.5
361	28	4.0	5	6	120	3000	115	2	1.5
362	28	3.5	4	11	120	3000	115	2	1.5
363	28	3.0	4	2	120	3000	115	2	1.5
364	28	2.5	3	7	120	3000	115	2	1.5
365	29	16.0	16	1	120	3000	115	2	1.5
366	29	15.5	15	10	120	3000	115	2	1.5
367	29	15.0	15	6	120	3000	115	2	1.5
368	29	14.5	15	1	120	3000	115	2	1.5
369	29	14.0	14	10	120	3000	115	2	1.5
370	29	13.5	14	5	120	3000	115	2	1.5
371	29	13.0	14	0	120	3000	115	2	1.5
372	29	12.5	13	8	120	3000	115	2	1.5
373	29	12.0	13	4	120	3000	115	2	1.5
374	29	11.5	12	11	120	3000	115	2	1.5
375	29	11.0	12	6	120	3000	115	2	1.5
376	29	10.5	12	1	120	3000	115	2	1.5
377	29	10.0	11	7	120	3000	115	2	1.5
378	29	9.5	11	2	120	3000	115	2	1.5
379	29	9.0	10	10	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
380	29	8.5	10	4	120	3000	115	2	1.5
381	29	8.0	9	10	120	3000	115	2	1.5
382	29	7.5	9	4	120	3000	115	2	1.5
383	29	7.0	8	10	120	3000	115	2	1.5
384	29	6.5	8	4	120	3000	115	2	1.5
385	29	6.0	7	10	120	3000	115	2	1.5
386	29	5.5	7	2	120	3000	115	2	1.5
387	29	5.0	6	8	120	3000	115	2	1.5
388	29	4.5	6	1	120	3000	115	2	1.5
389	29	4.0	5	6	120	3000	115	2	1.5
390	29	3.5	4	11	120	3000	115	2	1.5
391	29	3.0	4	4	120	3000	115	2	1.5
392	29	2.5	3	7	120	3000	115	2	1.5
393	30	16.0	16	4	120	3000	115	2	1.5
394	30	15.5	16	0	120	3000	115	2	1.5
395	30	15.0	15	8	120	3000	115	2	1.5
396	30	14.5	15	4	120	3000	115	2	1.5
397	30	14.0	14	11	120	3000	115	2	1.5
398	30	13.5	14	7	120	3000	115	2	1.5
399	30	13.0	14	2	120	3000	115	2	1.5
400	30	12.5	13	10	120	3000	115	2	1.5
401	30	12.0	13	5	120	3000	115	2	1.5
402	30	11.5	13	0	120	3000	115	2	1.5
403	30	11.0	12	7	120	3000	115	2	1.5
404	30	10.5	12	2	120	3000	115	2	1.5
405	30	10.0	11	8	120	3000	115	2	1.5
406	30	9.5	11	4	120	3000	115	2	1.5
407	30	9.0	10	10	120	3000	115	2	1.5
408	30	8.5	10	5	120	3000	115	2	1.5
409	30	8.0	9	11	120	3000	115	2	1.5
410	30	7.5	9	5	120	3000	115	2	1.5
411	30	7.0	8	11	120	3000	115	2	1.5
412	30	6.5	8	5	120	3000	115	2	1.5
413	30	6.0	7	10	120	3000	115	2	1.5
414	30	5.5	7	4	120	3000	115	2	1.5
415	30	5.0	6	8	120	3000	115	2	1.5
416	30	4.5	6	1	120	3000	115	2	1.5
417	30	4.0	5	6	120	3000	115	2	1.5
418	30	3.5	4	11	120	3000	115	2	1.5
419	30	3.0	4	4	120	3000	115	2	1.5
420	30	2.5	3	7	120	3000	115	2	1.5
421	31	16.0	16	6	120	3000	115	2	1.5
422	31	15.5	16	2	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
423	31	15.0	15	10	120	3000	115	2	1.5
424	31	14.5	15	6	120	3000	115	2	1.5
425	31	14.0	15	1	120	3000	115	2	1.5
426	31	13.5	14	8	120	3000	115	2	1.5
427	31	13.0	14	4	120	3000	115	2	1.5
428	31	12.5	13	11	120	3000	115	2	1.5
429	31	12.0	13	6	120	3000	115	2	1.5
430	31	11.5	13	1	120	3000	115	2	1.5
431	31	11.0	12	8	120	3000	115	2	1.5
432	31	10.5	12	4	120	3000	115	2	1.5
433	31	10.0	11	10	120	3000	115	2	1.5
434	31	9.5	11	5	120	3000	115	2	1.5
435	31	9.0	10	11	120	3000	115	2	1.5
436	31	8.5	10	5	120	3000	115	2	1.5
437	31	8.0	10	0	120	3000	115	2	1.5
438	31	7.5	9	6	120	3000	115	2	1.5
439	31	7.0	8	11	120	3000	115	2	1.5
440	31	6.5	8	5	120	3000	115	2	1.5
441	31	6.0	7	11	120	3000	115	2	1.5
442	31	5.5	7	4	120	3000	115	2	1.5
443	31	5.0	6	8	120	3000	115	2	1.5
444	31	4.5	6	2	120	3000	115	2	1.5
445	31	4.0	5	6	120	3000	115	2	1.5
446	31	3.5	4	11	120	3000	115	2	1.5
447	31	3.0	4	4	120	3000	115	2	1.5
448	31	2.5	3	7	120	3000	115	2	1.5
449	32	16.0	16	8	120	3000	115	2	1.5
450	32	15.5	16	4	120	3000	115	2	1.5
451	32	15.0	16	0	120	3000	115	2	1.5
452	32	14.5	15	7	120	3000	115	2	1.5
453	32	14.0	15	2	120	3000	115	2	1.5
454	32	13.5	14	11	120	3000	115	2	1.5
455	32	13.0	14	6	120	3000	115	2	1.5
456	32	12.5	14	1	120	3000	115	2	1.5
457	32	12.0	13	8	120	3000	115	2	1.5
458	32	11.5	13	2	120	3000	115	2	1.5
459	32	11.0	12	10	120	3000	115	2	1.5
460	32	10.5	12	5	120	3000	115	2	1.5
461	32	10.0	11	11	120	3000	115	2	1.5
462	32	9.5	11	6	120	3000	115	2	1.5
463	32	9.0	11	0	120	3000	115	2	1.5
464	32	8.5	10	6	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
465	32	8.0	10	0	120	3000	115	2	1.5
466	32	7.5	9	6	120	3000	115	2	1.5
467	32	7.0	9	0	120	3000	115	2	1.5
468	32	6.5	8	6	120	3000	115	2	1.5
469	32	6.0	7	11	120	3000	115	2	1.5
470	32	5.5	7	4	120	3000	115	2	1.5
471	32	5.0	6	10	120	3000	115	2	1.5
472	32	4.5	6	2	120	3000	115	2	1.5
473	32	4.0	5	7	120	3000	115	2	1.5
474	32	3.5	4	11	120	3000	115	2	1.5
475	32	3.0	4	4	120	3000	115	2	1.5
476	32	2.5	3	7	120	3000	115	2	1.5
477	33	16.0	16	11	120	3000	115	2	1.5
478	33	15.5	16	6	120	3000	115	2	1.5
479	33	15.0	16	1	120	3000	115	2	1.5
480	33	14.5	15	10	120	3000	115	2	1.5
481	33	14.0	15	5	120	3000	115	2	1.5
482	33	13.5	15	0	120	3000	115	2	1.5
483	33	13.0	14	7	120	3000	115	2	1.5
484	33	12.5	14	2	120	3000	115	2	1.5
485	33	12.0	13	10	120	3000	115	2	1.5
486	33	11.5	13	4	120	3000	115	2	1.5
487	33	11.0	12	11	120	3000	115	2	1.5
488	33	10.5	12	6	120	3000	115	2	1.5
489	33	10.0	12	0	120	3000	115	2	1.5
490	33	9.5	11	6	120	3000	115	2	1.5
491	33	9.0	11	1	120	3000	115	2	1.5
492	33	8.5	10	7	120	3000	115	2	1.5
493	33	8.0	10	1	120	3000	115	2	1.5
494	33	7.5	9	7	120	3000	115	2	1.5
495	33	7.0	9	0	120	3000	115	2	1.5
496	33	6.5	8	6	120	3000	115	2	1.5
497	33	6.0	7	11	120	3000	115	2	1.5
498	33	5.5	7	5	120	3000	115	2	1.5
499	33	5.0	6	10	120	3000	115	2	1.5
500	33	4.5	6	2	120	3000	115	2	1.5
501	33	4.0	5	7	120	3000	115	2	1.5
502	33	3.5	5	0	120	3000	115	2	1.5
503	33	3.0	4	4	120	3000	115	2	1.5
504	33	2.5	3	7	120	3000	115	2	1.5
505	34	16.0	17	0	120	3000	115	2	1.5
506	34	15.5	16	8	120	3000	115	2	1.5

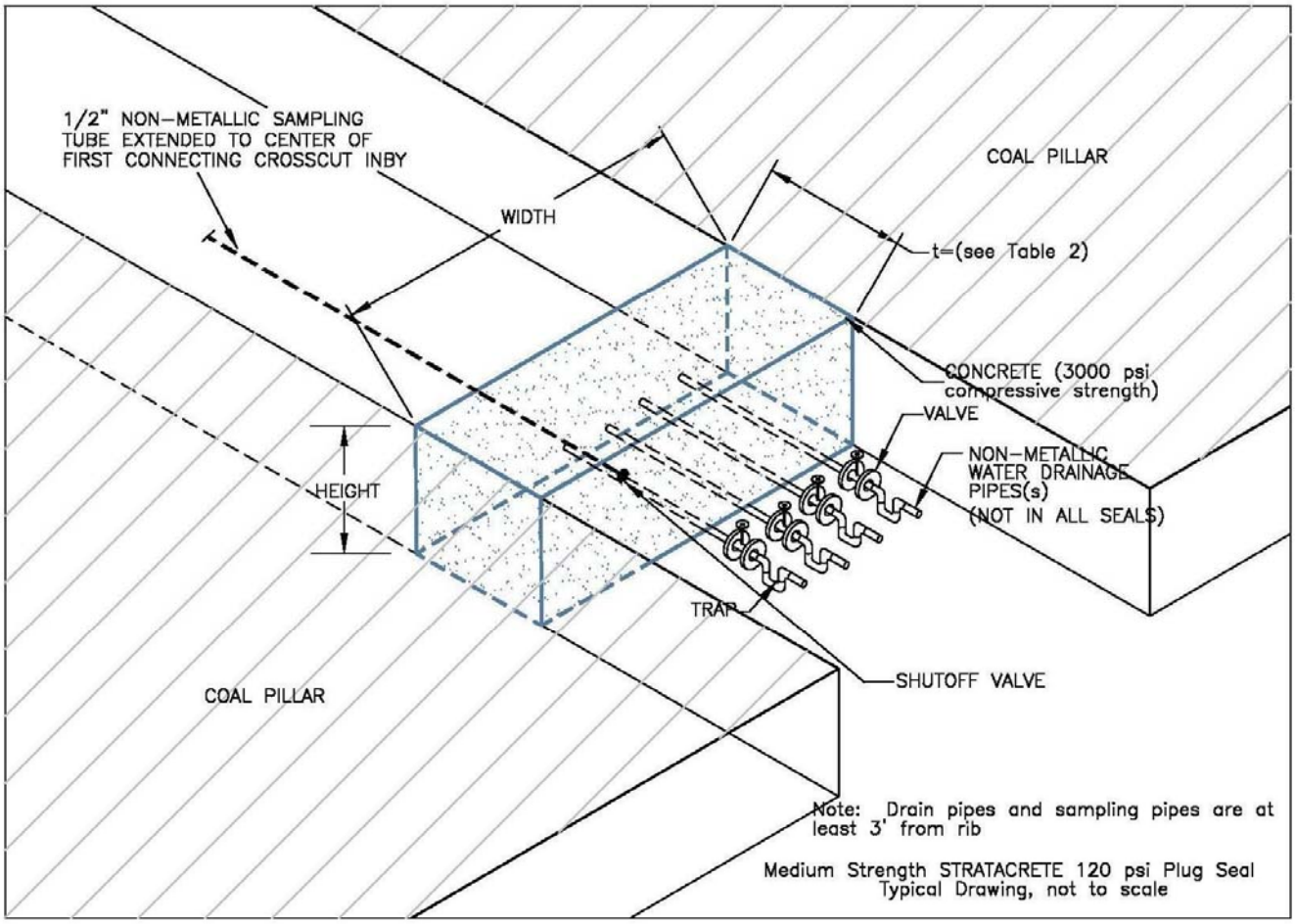
Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
507	34	15.0	16	4	120	3000	115	2	1.5
508	34	14.5	15	11	120	3000	115	2	1.5
509	34	14.0	15	6	120	3000	115	2	1.5
510	34	13.5	15	1	120	3000	115	2	1.5
511	34	13.0	14	8	120	3000	115	2	1.5
512	34	12.5	14	4	120	3000	115	2	1.5
513	34	12.0	13	11	120	3000	115	2	1.5
514	34	11.5	13	6	120	3000	115	2	1.5
515	34	11.0	13	0	120	3000	115	2	1.5
516	34	10.5	12	7	120	3000	115	2	1.5
517	34	10.0	12	1	120	3000	115	2	1.5
518	34	9.5	11	7	120	3000	115	2	1.5
519	34	9.0	11	1	120	3000	115	2	1.5
520	34	8.5	10	7	120	3000	115	2	1.5
521	34	8.0	10	1	120	3000	115	2	1.5
522	34	7.5	9	7	120	3000	115	2	1.5
523	34	7.0	9	1	120	3000	115	2	1.5
524	34	6.5	8	6	120	3000	115	2	1.5
525	34	6.0	8	0	120	3000	115	2	1.5
526	34	5.5	7	5	120	3000	115	2	1.5
527	34	5.0	6	10	120	3000	115	2	1.5
528	34	4.5	6	2	120	3000	115	2	1.5
529	34	4.0	5	7	120	3000	115	2	1.5
530	34	3.5	5	0	120	3000	115	2	1.5
531	34	3.0	4	4	120	3000	115	2	1.5
532	34	2.5	3	7	120	3000	115	2	1.5
533	35	16.0	17	2	120	3000	115	2	1.5
534	35	15.5	16	10	120	3000	115	2	1.5
535	35	15.0	16	5	120	3000	115	2	1.5
536	35	14.5	16	0	120	3000	115	2	1.5
537	35	14.0	15	8	120	3000	115	2	1.5
538	35	13.5	15	2	120	3000	115	2	1.5
539	35	13.0	14	10	120	3000	115	2	1.5
540	35	12.5	14	5	120	3000	115	2	1.5
541	35	12.0	14	0	120	3000	115	2	1.5
542	35	11.5	13	6	120	3000	115	2	1.5
543	35	11.0	13	1	120	3000	115	2	1.5
544	35	10.5	12	7	120	3000	115	2	1.5
545	35	10.0	12	2	120	3000	115	2	1.5
546	35	9.5	11	8	120	3000	115	2	1.5
547	35	9.0	11	2	120	3000	115	2	1.5
548	35	8.5	10	8	120	3000	115	2	1.5

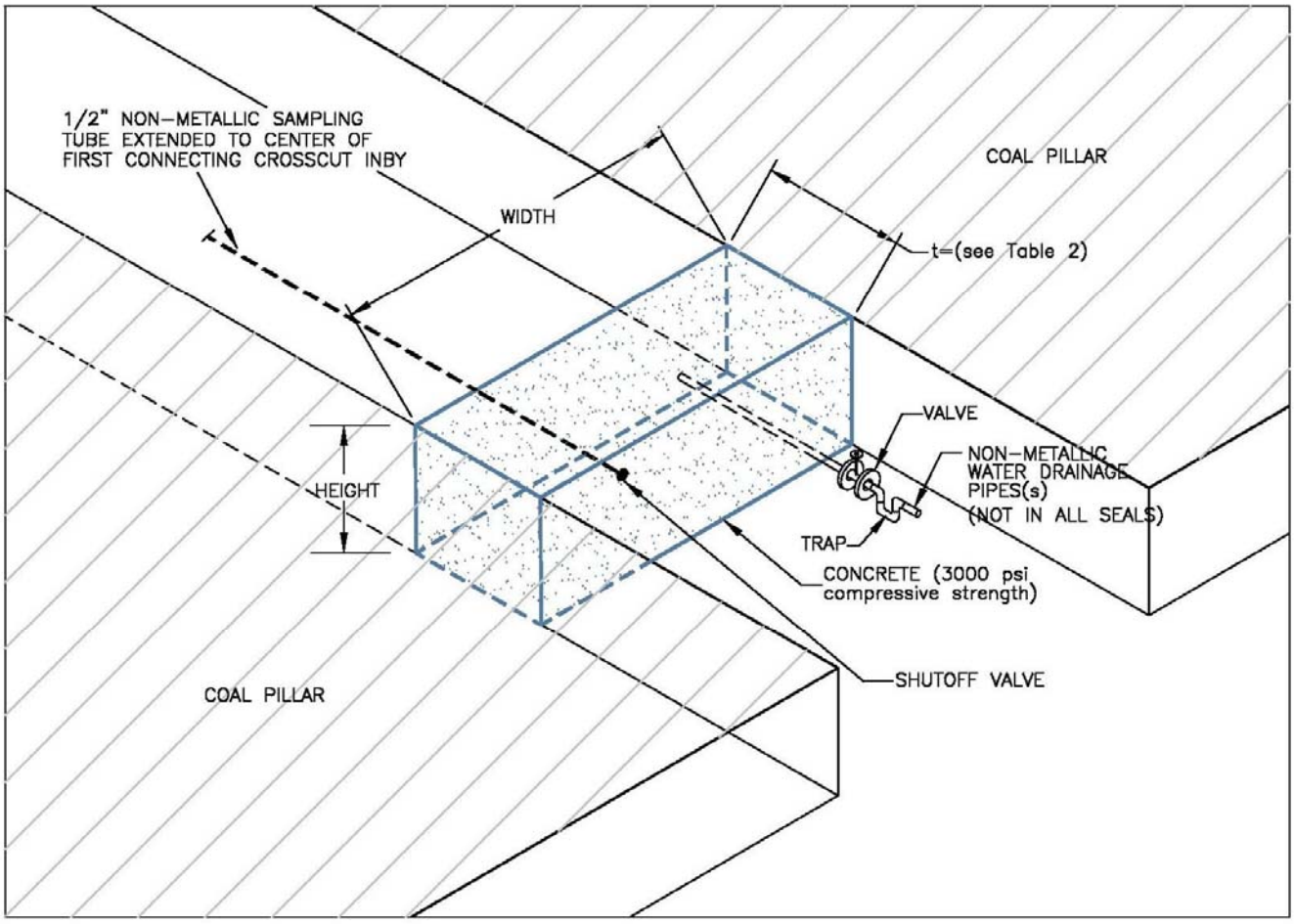
Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
549	35	8.0	10	2	120	3000	115	2	1.5
550	35	7.5	9	8	120	3000	115	2	1.5
551	35	7.0	9	1	120	3000	115	2	1.5
552	35	6.5	8	7	120	3000	115	2	1.5
553	35	6.0	8	0	120	3000	115	2	1.5
554	35	5.5	7	5	120	3000	115	2	1.5
555	35	5.0	6	10	120	3000	115	2	1.5
556	35	4.5	6	2	120	3000	115	2	1.5
557	35	4.0	5	7	120	3000	115	2	1.5
558	35	3.5	5	0	120	3000	115	2	1.5
559	35	3.0	4	4	120	3000	115	2	1.5
560	35	2.5	3	8	120	3000	115	2	1.5
561	36	16.0	17	4	120	3000	115	2	1.5
562	36	15.5	17	0	120	3000	115	2	1.5
563	36	15.0	16	7	120	3000	115	2	1.5
564	36	14.5	16	2	120	3000	115	2	1.5
565	36	14.0	15	10	120	3000	115	2	1.5
566	36	13.5	15	5	120	3000	115	2	1.5
567	36	13.0	14	11	120	3000	115	2	1.5
568	36	12.5	14	6	120	3000	115	2	1.5
569	36	12.0	14	1	120	3000	115	2	1.5
570	36	11.5	13	7	120	3000	115	2	1.5
571	36	11.0	13	2	120	3000	115	2	1.5
572	36	10.5	12	8	120	3000	115	2	1.5
573	36	10.0	12	2	120	3000	115	2	1.5
574	36	9.5	11	10	120	3000	115	2	1.5
575	36	9.0	11	4	120	3000	115	2	1.5
576	36	8.5	10	10	120	3000	115	2	1.5
577	36	8.0	10	2	120	3000	115	2	1.5
578	36	7.5	9	8	120	3000	115	2	1.5
579	36	7.0	9	2	120	3000	115	2	1.5
580	36	6.5	8	7	120	3000	115	2	1.5
581	36	6.0	8	0	120	3000	115	2	1.5
582	36	5.5	7	6	120	3000	115	2	1.5
583	36	5.0	6	11	120	3000	115	2	1.5
584	36	4.5	6	4	120	3000	115	2	1.5
585	36	4.0	5	7	120	3000	115	2	1.5
586	36	3.5	5	0	120	3000	115	2	1.5
587	36	3.0	4	4	120	3000	115	2	1.5
588	36	2.5	3	8	120	3000	115	2	1.5
589	37	16.0	17	6	120	3000	115	2	1.5
590	37	15.5	17	1	120	3000	115	2	1.5

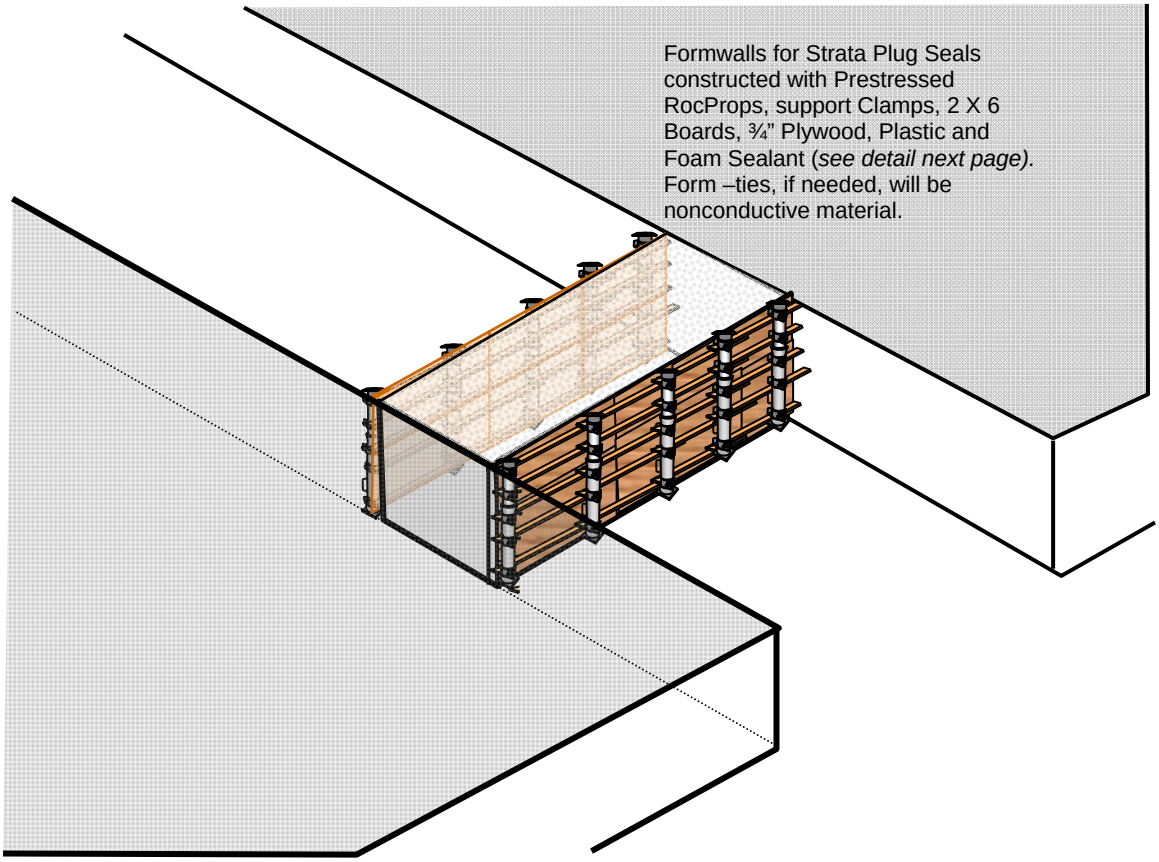
Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
591	37	15.0	16	8	120	3000	115	2	1.5
592	37	14.5	16	4	120	3000	115	2	1.5
593	37	14.0	15	11	120	3000	115	2	1.5
594	37	13.5	15	6	120	3000	115	2	1.5
595	37	13.0	15	1	120	3000	115	2	1.5
596	37	12.5	14	7	120	3000	115	2	1.5
597	37	12.0	14	2	120	3000	115	2	1.5
598	37	11.5	13	8	120	3000	115	2	1.5
599	37	11.0	13	4	120	3000	115	2	1.5
600	37	10.5	12	10	120	3000	115	2	1.5
601	37	10.0	12	4	120	3000	115	2	1.5
602	37	9.5	11	10	120	3000	115	2	1.5
603	37	9.0	11	4	120	3000	115	2	1.5
604	37	8.5	10	10	120	3000	115	2	1.5
605	37	8.0	10	4	120	3000	115	2	1.5
606	37	7.5	9	10	120	3000	115	2	1.5
607	37	7.0	9	2	120	3000	115	2	1.5
608	37	6.5	8	8	120	3000	115	2	1.5
609	37	6.0	8	1	120	3000	115	2	1.5
610	37	5.5	7	6	120	3000	115	2	1.5
611	37	5.0	6	11	120	3000	115	2	1.5
612	37	4.5	6	4	120	3000	115	2	1.5
613	37	4.0	5	8	120	3000	115	2	1.5
614	37	3.5	5	0	120	3000	115	2	1.5
615	37	3.0	4	4	120	3000	115	2	1.5
616	37	2.5	3	8	120	3000	115	2	1.5
617	38	16.0	17	7	120	3000	115	2	1.5
618	38	15.5	17	2	120	3000	115	2	1.5
619	38	15.0	16	10	120	3000	115	2	1.5
620	38	14.5	16	5	120	3000	115	2	1.5
621	38	14.0	16	0	120	3000	115	2	1.5
622	38	13.5	15	7	120	3000	115	2	1.5
623	38	13.0	15	2	120	3000	115	2	1.5
624	38	12.5	14	8	120	3000	115	2	1.5
625	38	12.0	14	4	120	3000	115	2	1.5
626	38	11.5	13	10	120	3000	115	2	1.5
627	38	11.0	13	5	120	3000	115	2	1.5
628	38	10.5	12	11	120	3000	115	2	1.5
629	38	10.0	12	5	120	3000	115	2	1.5
630	38	9.5	11	11	120	3000	115	2	1.5
631	38	9.0	11	5	120	3000	115	2	1.5
632	38	8.5	10	11	120	3000	115	2	1.5

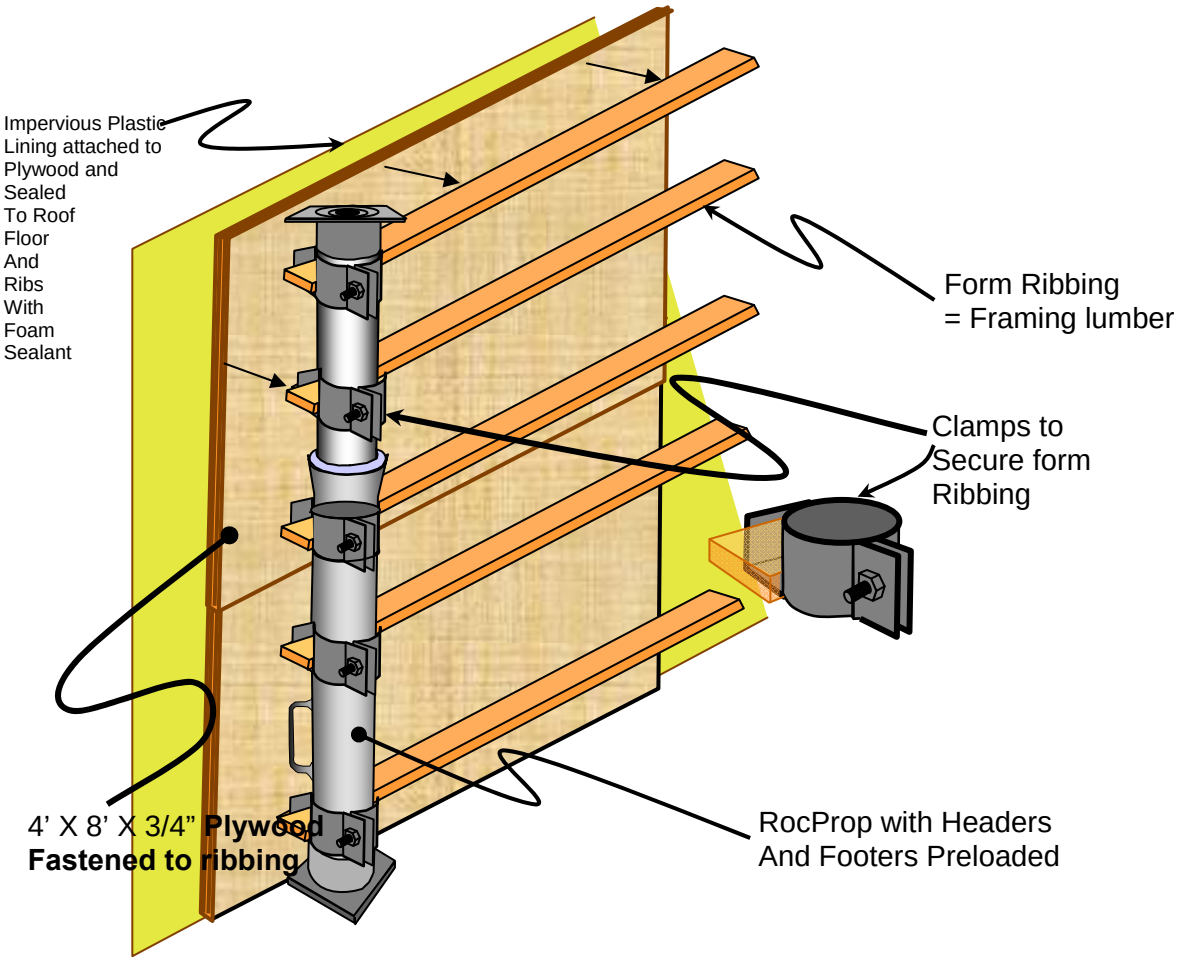
Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
633	38	8.0	10	4	120	3000		2	1.5
634	38	7.5	9	10	120	3000	115	2	1.5
635	38	7.0	9	4	120	3000	115	2	1.5
636	38	6.5	8	8	120	3000	115	2	1.5
637	38	6.0	8	1	120	3000	115	2	1.5
638	38	5.5	7	6	120	3000	115	2	1.5
639	38	5.0	6	11	120	3000	115	2	1.5
640	38	4.5	6	4	120	3000	115	2	1.5
641	38	4.0	5	8	120	3000	115	2	1.5
642	38	3.5	5	0	120	3000	115	2	1.5
643	38	3.0	4	5	120	3000	115	2	1.5
644	38	2.5	3	8	120	3000	115	2	1.5
645	39	16.0	17	10	120	3000	115	2	1.5
646	39	15.5	17	5	120	3000	115	2	1.5
647	39	15.0	17	0	120	3000	115	2	1.5
648	39	14.5	16	6	120	3000	115	2	1.5
649	39	14.0	16	1	120	3000	115	2	1.5
650	39	13.5	15	8	120	3000	115	2	1.5
651	39	13.0	15	4	120	3000	115	2	1.5
652	39	12.5	14	10	120	3000	115	2	1.5
653	39	12.0	14	5	120	3000	115	2	1.5
654	39	11.5	13	11	120	3000	115	2	1.5
655	39	11.0	13	5	120	3000	115	2	1.5
656	39	10.5	12	11	120	3000	115	2	1.5
657	39	10.0	12	6	120	3000	115	2	1.5
658	39	9.5	12	0	120	3000	115	2	1.5
659	39	9.0	11	5	120	3000	115	2	1.5
660	39	8.5	10	11	120	3000	115	2	1.5
661	39	8.0	10	5	120	3000	115	2	1.5
662	39	7.5	9	10	120	3000	115	2	1.5
663	39	7.0	9	4	120	3000	115	2	1.5
664	39	6.5	8	8	120	3000	115	2	1.5
665	39	6.0	8	1	120	3000	115	2	1.5
666	39	5.5	7	6	120	3000	115	2	1.5
667	39	5.0	6	11	120	3000	115	2	1.5
668	39	4.5	6	4	120	3000	115	2	1.5
669	39	4.0	5	8	120	3000	115	2	1.5
670	39	3.5	5	0	120	3000	115	2	1.5
671	39	3.0	4	5	120	3000	115	2	1.5
672	39	2.5	3	8	120	3000	115	2	1.5
673	40	16.0	17	11	120	3000	115	2	1.5
674	40	15.5	17	6	120	3000	115	2	1.5

Seal Design Number	Seal Width feet W	Seal Height feet H	Seal Thickness t feet & inches		Seal Design Strength psi P	Uniaxial Compressive Strength psi σ_c	Minimum Shear Strength psi f_s	Dynamic Load Factor DLF	Seal Safety Factor FS
675	40	15.0	17	1	120	3000	115	2	1.5
676	40	14.5	16	8	120	3000	115	2	1.5
677	40	14.0	16	2	120	3000	115	2	1.5
678	40	13.5	15	10	120	3000	115	2	1.5
679	40	13.0	15	5	120	3000	115	2	1.5
680	40	12.5	14	11	120	3000	115	2	1.5
681	40	12.0	14	5	120	3000	115	2	1.5
682	40	11.5	14	0	120	3000	115	2	1.5
683	40	11.0	13	6	120	3000	115	2	1.5
684	40	10.5	13	0	120	3000	115	2	1.5
685	40	10.0	12	6	120	3000	115	2	1.5
686	40	9.5	12	0	120	3000	115	2	1.5
687	40	9.0	11	6	120	3000	115	2	1.5
688	40	8.5	11	0	120	3000	115	2	1.5
689	40	8.0	10	5	120	3000	115	2	1.5
690	40	7.5	9	11	120	3000	115	2	1.5
691	40	7.0	9	4	120	3000	115	2	1.5
692	40	6.5	8	10	120	3000	115	2	1.5
693	40	6.0	8	2	120	3000	115	2	1.5
694	40	5.5	7	7	120	3000	115	2	1.5
695	40	5.0	7	0	120	3000	115	2	1.5
696	40	4.5	6	4	120	3000	115	2	1.5
697	40	4.0	5	8	120	3000	115	2	1.5
698	40	3.5	5	0	120	3000	115	2	1.5
699	40	3.0	4	5	120	3000	115	2	1.5
700	40	2.5	3	8	120	3000	115	2	1.5


1/2" NON-METALLIC SAMPLING TUBE EXTENDED TO CENTER OF FIRST CONNECTING CROSSCUT INBY
WIDTH
COAL PILLAR
t=(see Table 2)
CONCRETE (3000 psi compressive strength)
VALVE
NON-METALLIC WATER DRAINAGE PIPES(s) (NOT IN ALL SEALS)
HEIGHT
TRAP
SHUTOFF VALVE
COAL PILLAR
Note: Drain pipes and sampling pipes are at least 3' from rib
Medium Strength STRATACRETE 120 psi Plug Seal
Typical Drawing, not to scale


1/2" NON-METALLIC SAMPLING TUBE EXTENDED TO CENTER OF FIRST CONNECTING CROSSCUT INBY
WIDTH
COAL PILLAR
t=(see Table 2)
VALVE
NON-METALLIC WATER DRAINAGE PIPES(s) (NOT IN ALL SEALS)
HEIGHT
TRAP
CONCRETE (3000 psi compressive strength)
SHUTOFF VALVE
COAL PILLAR


Formwalls for Strata Plug Seals constructed with Prestressed RocProps, support Clamps, 2 X 6 Boards, ¾" Plywood, Plastic and Foam Sealant (*see detail next page).* Form –ties, if needed, will be nonconductive material.


Impervious Plastic Lining attached to Plywood and Sealed To Roof Floor And Ribs With Foam Sealant
Form Ribbing = Framing lumber
Clamps to Secure form Ribbing
4' X 8' X 3/4" **Plywood Fastened to ribbing**
RocProp with Headers And Footers Preloaded