



## 2022 Footprint Engineering Inc.

### FeSpiral RSS QA and CAD Details

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## **Section 1.0: FeSpiral™ (M.H. Rating: 9/10 - Winner)**

Two lengths of basaltic, or FRP rebar are formed into spirals and coupled at cross over locations to form a structure to be embedded into a cementitious material or covered in a cementitious material for repairing a form or in new construction.

### **Section 1.1: FeSpiral™ RSS**

This RS System provides large diameter culvert and sewer. Specifically, the solution provides steps to install a spiral rebar cage.

#### **1-SURVEY SITE CONDITIONS**

Prior to any work being initiated, the owner must survey the site conditions. The owner should look for any abnormalities or additional problems that may exist on site. The owner must also provide the bypass of water into the culvert. Use Lidar survey to provide evidence of conditions to be compared with final results. Key survey points to resolve at 12 pm, 3 pm, 6 pm, 9 pm clock positions.

#### **2-PREPARE AND CLEAN SUBSTRATE**

Substrate where works are taking place must be prepared for the Rehabilicrete™ System. The substrate is prepared with high pressure water blasting to remove all bond breaking substances. Clean substrate with a pressure washer at 3000-5000 psi (5000 psi preferred). Remove all dust and debris from areas to be treated, anchored or supported.

#### **3-COMPLETE INSTALLATION OF 10 M BARS**

Install 5M spiral bars running along the inner surface of the culvert. Rebar is fiber reinforced polymer rebar. The bend radius of the rebar should not be too small so as to ensure the rebar does not become damaged.

The spiral bars should be installed with a right lay and a left lay beginning at the discharge end of the culvert. The two spiral bars will run in opposite directional rotations from one another so that they cross and overlap periodically. The rebar is to be run through the culvert at a 22.5 degree angle thus "spiraling". The structure can be erected with two workers. No welding is required. The first end of the

rebar will be fixed at 3 o'clock and the other front end of the second piece of rebar will be fixed at 9 o'clock.

Workers are to push the rebar into the structure with moderate force and to interlace the two pieces of rebar forming 'spirals'. Plastic ties will hold the rebar at points in which they cross over one another.

#### **4-APPLY CEMENTITIOUS MATERIAL**

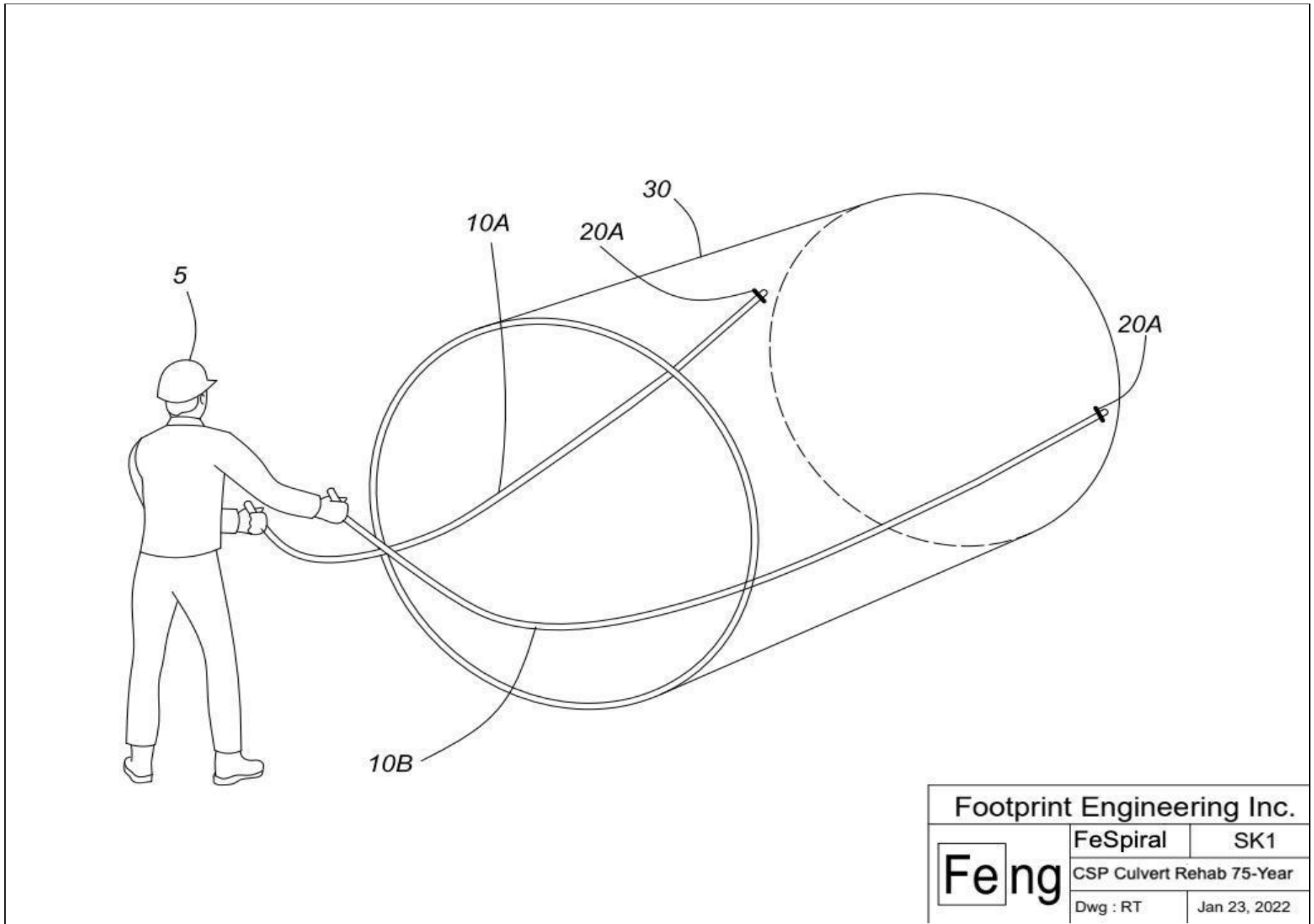
Add a cementitious material coating to the solution according to your needs. Shotcrete, repair mortar, waterproof slurry, and grout are all examples of suitable solutions.

#### **5-SURVEY FINAL RESULTS**

Owner to survey with Lidar to analyze before and after results. Use observational methods of precision survey to enhance accuracy.

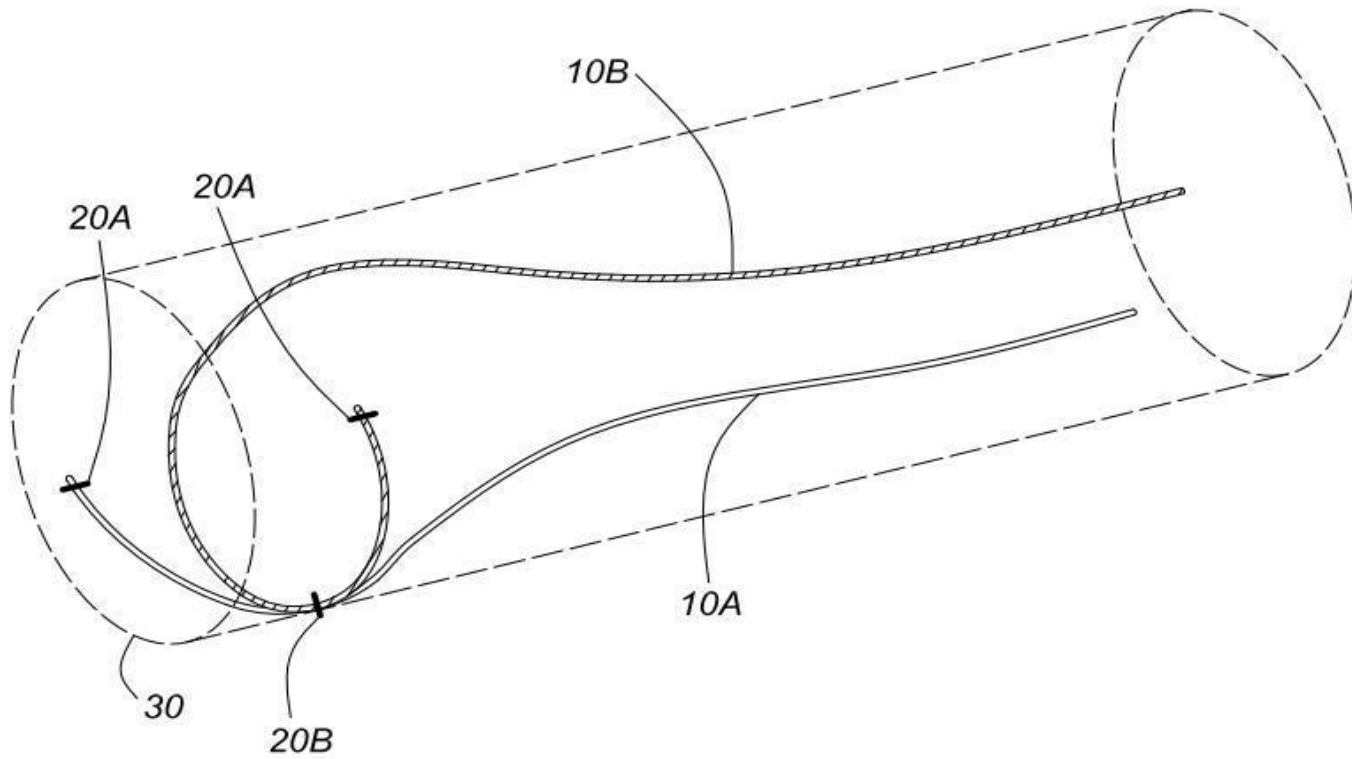
#### **Section 1.2: FeSpiral™ CAD Illustrations**

Several computer-aided design illustrations depicting the FeSpiral system can be seen below.

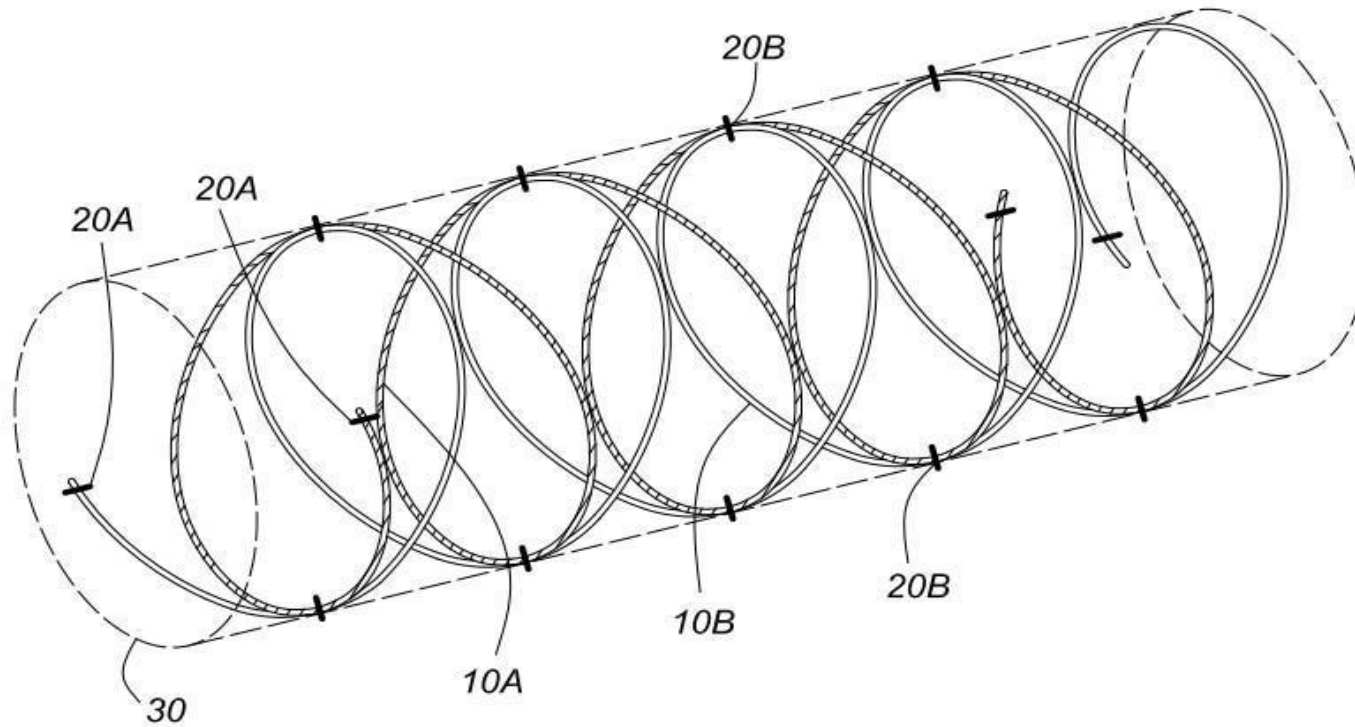


Footprint Engineering Inc.		
Fe ng	FeSpiral	SK1
	CSP Culvert Rehab 75-Year	
	Dwg : RT	Jan 23, 2022

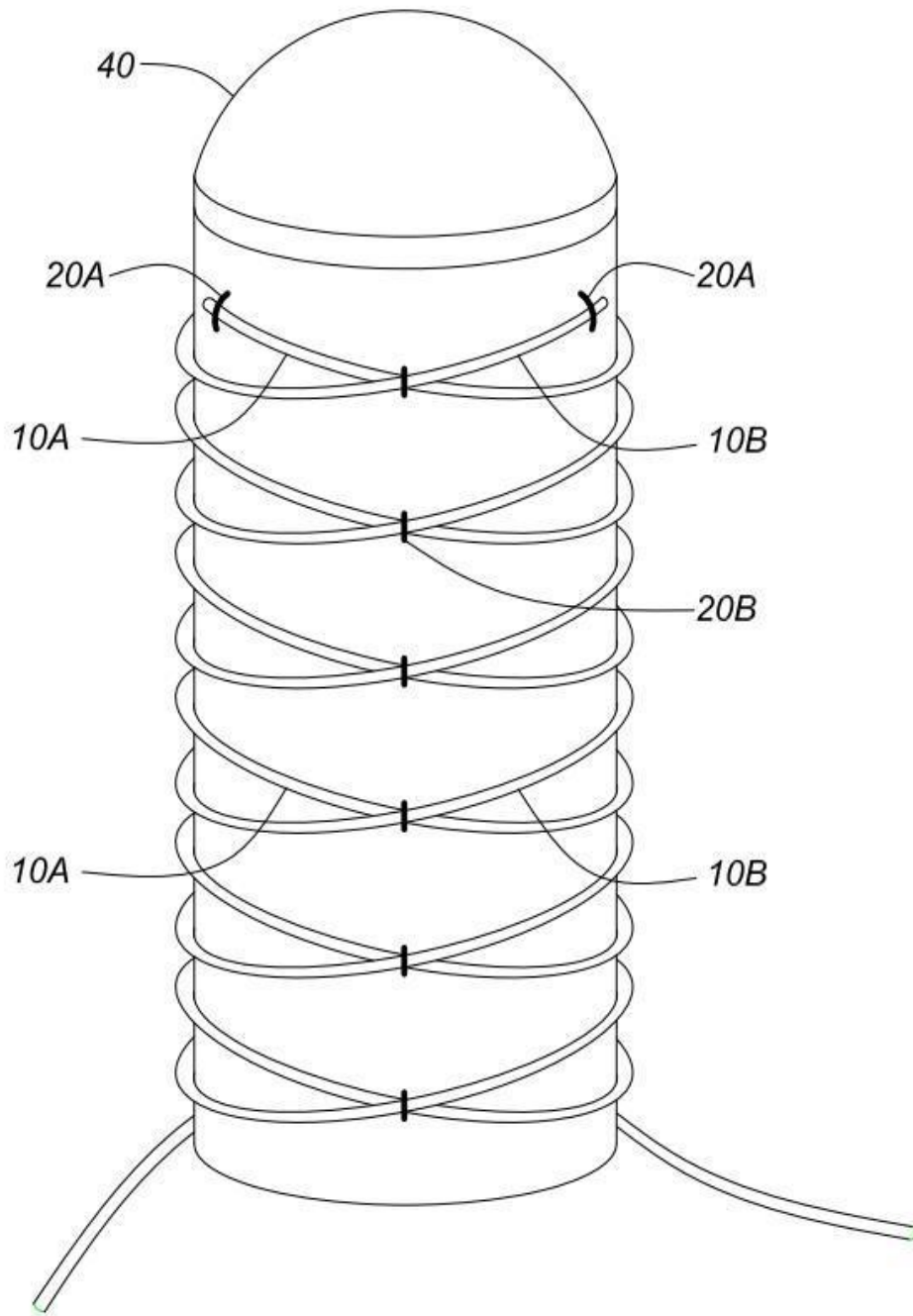
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Footprint Engineering Inc.		
Fe ng	FeSpiral	SK2
	5-mm Basaltic Bar	
	Dwg : RT	Jan 23, 2022



Footprint Engineering Inc.		
Fe ng	FeSpiral	SK3
	5-mm Spiral Basaltic Bar	
	Dwg : RT	Jan 23, 2022



Footprint Engineering Inc.		
Feng	FeSpiral	SK4
	5-mm Spiral Basaltic Bar	
	Dwg : RT	Jan 23, 2022