VIRTUAL POLYMER
COMPOUNDS, LLC

10478 Ridge Road • Medina, New York 14103
Phone: 585-735-9668 • Toll Free: 888-290-9522
Fax: 585-735-9965 • www.virtualpolymercompounds.com

Administrative Office: One John James Audubon Pkwy • Amherst, NY 14228

Note to User: These specifications are provided to aid the Engineer in the design and complete specification of a Metering Manhole System with H20 Cover. Proper selection and use of any primary measuring device requires the services of a Professional Engineer. These documents are not to be used in lieu of the services of a design professional.

Product: *(Insert Size)* Fiberglass Metering Manhole System with H20 Cover
Project: *(Insert Project Name)*
Manufactured By: Virtual Polymer Compounds, LLC

SPECIFICATION SECTION 11314
SIXTY INCH DIA. FIBERGLASS METERING MANHOLE SYSTEM WITH H20 COVER

PART ONE - GENERAL INFORMATION

1.01 Fabricate a 60” diameter fiberglass reinforced polyester composite metering manhole system that meets both the project specification and the standards established by ASTM D3753-81.

1.02 The Manhole will include top lid reduction from 60” to 24” (ID) for installation of H-20 type cover.

1.02.1 The manway reducer is to be concentric with respect to the larger portion of the manhole.

1.02.2 The manhole shall provide an area for which a typical ring and cover plate can be supported without damage to the manhole.

1.03 The Metering Manhole System will include a fiberglass *(insert size and type of Flume).* The Flume will include an integral coverging section adapter terminating with a *(insert pipe size)* ID fiberglass pipe stub. The Flume will also include diverging section end adapters that will terminate with a *(insert pipe size)* ID fiberglass pipe stub. Sections of the Flume and end adapters that extend beyond the Manhole will be covered with a core composite laminate that will meet the same load requirements as the manhole structure itself. Flumes must be integral to the manhole floor and body. Flume flow data is shown on the attached Flow Chart.

1.04 Fiberglass pipe stubs will be fitted with neoprene rubber slip over couplers. Couplers will be secured in place with stainless steel clamping rings.

1.05 The Manhole will be fitted with an 18" wide fiberglass ladder. The ladder will extend from the manway reducer to the top flange of the integral flume. The ladder will be attached to a fiberglass mounting bracket that is integral to the manhole. No penetration to the Manhole body will be required for ladder installation.

1.05.01 The fiberglass ladder will meet all current OSHA requirements for ladders of this nature.

1.06 The Manhole will be fabricated with an integral fiberglass floor. The floor will be 1/2" thick laminate. The floor will extend beyond the manhole body to form a continuous base mounting flange. Where the Flume extends beyond the manhole, the flume will include a 1/2" thick by 2" wide integral mounting flange.

1.07 The wall laminate is 1/2” thick. The glass reinforcing content of the laminate is a nominal 30%.

1.08 The entire Manhole body laminate will be pigmented white. The interior surface of the manhole will be a smooth, resin rich finish.

1.09 A Confined Space Entry Warning Sign will be mounted to a removable secondary cover. This will provide warning and removal demonstrates acknowledgment prior to entry.

1.10 The surface of the Flume will be finished high grade polyester chemical resistant gel coat. The color will be beige.

1.11 The Flume is to include the following standard option(s): *(Include only those required and adjust line numbering accordingly)*

1.11.01 Provide Fiberglass Ultrasonic Transducer Mounting Bracket and pre drill flange for installation. Include required hardware for installation.

1.11.02 Fabricate with integral Staff Gauge graduated feet and tenth of a foot.

1.11.03 Provide Integral fiberglass stilling *well (insert size of 8,10,12)* inch ID.

1.11.04 Provide fixed Stainless Steel Bubble Tube

1.11.05 Provide fixed Stainless Steel Sampler Tube

1.11.06 Fabricate with integral pH Probe Mounting Cavity

1.11.07 Fabricate with integral Pressure Transducer Cavity

1.12 The Manhole will be fabricated with *(insert required number)* two inch diameter integral fiberglass NPT coupling to be used as cable passes. The location of this coupling will be provided to the manufacturer by the Contractor prior to manhole fabrication.

PART TWO - MATERIALS

2.01 All interior surfaces of the Manhole will be smooth and free of surface defects.

2.02 Fiberglass laminate will include high grade polyester resin and multiple layers of 1.5 ounce chopped strand mat.

2.03 Manhole ladder will be fabricated by Virtual Polymer Compounds, LLC and integral to the manhole.

2.04 The neoprene pipe coupling will be manufactured by Fernco Company.

2.04.01 Couplers will accept a maximum of 5% deflection.

2.04.02 The couplings will meet the following standards:

Tensile	ASTM D 412	1200psi 300% elongation
Hardness	ASTM D2240	Shore A 55min. 65max.
Compression	ASTM D 395	25% deflection
Tear Strength	ASTM D 624	125 lb./inc.

2.05 Structural Load rating of the manhole is to have a minimum dynamic-load rating of 16,000 lbf. when tested according to part 8.4.1 and 8.4.1.1 of ASTM 3753. The complete manhole will not leak, crack, or suffer other damage when loaded to 40,000 lbf. The unit will not deflect downward more that 0.25 inches when point loaded at 24,000 lbf.

2.05.1 Sections of the Flume may extend beyond the manhole body. These sections of flume will be covered and sealed with a core composite fiberglass cover. These covers will meet equivalent load ratings as those of the manhole body. They will be completely leak free and will deflect less than 0.125 inches at full load.

2.05.2 Typical flume cover laminate will include a 1/2" internal fiberglass skin (tension skin), a 2" thick - 8lb density foam core and a 1/2" external skin (compression skin).

2.06 The circular cylinder of the manhole will be meet stiffness standard as defined by ASTM D 2412 with a value of 2.01 for a manhole length 3 to 20 feet.

2.07 All metallic hardware will be 18-8 Grade Stainless Steel.

2.08 The fiberglass laminate used for fabrication will have been tested and exhibit following properties at 1/8" laminate thickness, additional details of testing can be found on the attached System Testing Data Sheet S1.

2.08.01	Specific Gravity	1.20		
2.08.02	Percent of Glass	30%		
2.08.03	Flexural Strength (ASTM D790)		11,300 psi	
2.08.04	Flexural Modulus (ASTM D638)			0.88
2.08.05	Tensile Strength (ASTM D638)		9,700 psi	
2.08.06	Barcol Hardness (ASTM D25832)			40
2.08.07	Heat Distortion Temp. (ASTM D648)		148(F)	

2.09 The Metering Manhole Structures will be fabricated according to ANSI/ASTM D-3753.

2.10 The Flume will meet the design standards for this type flume as published in US Department of Commerce publication PB-250 371 (Nov. 1975) and/or as established by industry standards and submitted herein.

PART THREE - INSTALLATION

3.01 The Metering Manhole System is to be installed in accordance with the installation recommendations provided by the Manhole Manufacturer. Deviation from these specifications must be approved in advance by the Project Engineer and the Manhole Manufacturer.

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