


Section O: Structures	Effective Date: <u>01-01-2026</u>
<p>O1 Fiberglass Wet Well L.P.S.</p> <p>O2 (Deleted)</p> <p>O3 (Deleted)</p> <p>O4 Multi-Component Stress Panel Liner System/ Sanitary Sewer</p> <p>O5 (Deleted)</p> <p>O6 Precast Manholes</p> <p>O 6.1 Precast Wet Well</p> <p>O 6.2 Precast Valve Vaults</p> <p>O 6.3 Polymer Concrete Manholes</p> <p>O 6.4 CIP Manhole Liner/Sanitary Sewer</p>	

O 1 – FIBERGLASS WET WELL - LOW PRESSURE SEWER:		Effective Date: <u>01-01-2026</u>
<p><u>SPECIFICATION:</u> Fiberglass manholes shall meet or exceed the performance specifications of:</p> <ul style="list-style-type: none"> • Shall be manufactured from commercial grade polyester resin or other suitable polyester or vinyl ester resins with fiberglass reinforcements specifically manufactured for use with sewage. • Shall be a one-piece unit. • Shall have no vertical seams. • Shall meet ASTM Standards D 3753, Fiberglass Reinforced Polyester Manholes and Wet Wells. • Shall be sized per construction drawings. • The wall thickness shall be sufficient to withstand a water saturated sand load of 120 lbs. per cubic foot (1.9 gms/cu. cm with a 1.5 safety factor. • The Ballast support flange shall extend a minimum of three inches (76mm) on the radius of the basin. The flange is fibreglassed to the bottom of the basin. When secured properly to a concrete pad or pouring concrete over and around the flange. It shall prevent the basin from rising or floating out of the ground when empty as a result of static ground pressure. • The basin shall withstand a maximum temperature of 150°F (66°C). 	<p><u>SPECIFICATION (CONT.)</u></p> <ul style="list-style-type: none"> • Aluminum Basin covers shall have hinged access door, lifting handle, locking provisions, stainless steel hinges and hardware and provisions for 2" NPT vent. • Covers available for basin diameters 36" through 60" (914 through 1524mm) and are .38" (6.4mm) thick. • ALL covers have a service rating of 150 lbs/sq. ft. (732kgs/sq. meter) minimum. 	
		<p><u>RESTRICTIONS:</u> For low pressure sewer only.</p>
		<p><u>MANUFACTURER:</u></p> <ul style="list-style-type: none"> • Barnes Pressure Systems • Open
		

O 4 – MULTI-COMPONENT STRESS PANEL LINER SYSTEM/ SANITARY SEWER:

Effective Date: 01-01-2026

SPECIFICATION:

Multi-layered poly resin composite protective manhole and wet well liner system shall meet or exceed the performance specifications of:

- Shall provide a waterproof, corrosion resistant liner to prevent any deterioration of concrete surfaces from hydrogen sulfide and other corrosive gases/acids produced by wastewater.
- Manufacture shall warrant material and workmanship for a minimum period of ten (10) years.
- Shall be a non load-bearing component.
- To ensure total unit responsibility, all material and installation shall be furnished by, and coordinated with, one supplier/ manufacturer.
- The interior surfaces to be protected shall include the walls, ceiling, benches and pipe entries.
- Total thickness of multi-component stress panel liner shall be a minimum of 500 mils and shall sustain a 300 PSI pull test.
- Use of this system is restricted to rehabilitation of existing structures.

PHYSICAL/ MATERIAL PROPERTIES:

1. Liner.

	<u>Installation</u>	<u>Liner</u>
Moisture barrier		Modified Polymer
Surfacer		Polyurethane/Polymeric blend foam
Final corrosion barrier		Modified polymer

2. Modified polymer shall be sprayable, solvent free, two-component polymeric, moisture/chemical barrier specifically developed for the corrosive wastewater environment.

TYPICAL CHEMICAL ANALYSIS

“A” Component

Viscosity, 77° F, cps., ASTM D-1638	300-400
Physical State	Liquid
Color	Clear to amber
Hygroscopicity	Reacts with water

“B” Component

Viscosity, 160° F, cps., ASTM D-1638	400-600
Physical State	Liquid
Color	Flamingo Pink
Non-Volatile	100%

Reaction Profile (100 grams, 175° F sample)

Gel Time, seconds	1-2
Tack Free Time, seconds	15
Cure Time, seconds	30

Processing

A System / B System, volume ratio	1.00 / 1.00
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PHYSICAL/ MATERIAL PROPERTIES (continued):

Typical Physical Properties

Tensile Strength, PSI	>1500
Elongation, %	>125
Tear Strength, PSI	350
Shore D Hardness	55-65
100% Modulus, PSI	>1500

3. Polyurethane Rigid Structure Foam, low viscosity two-component, containing flame retardants.

TYPICAL CHEMICAL ANALYSIS

“A” Component

Viscosity, 77° F, cps., ASTM D-1638	200
Physical State	Liquid
Color	Dark Brown
Hygroscopicity	Reacts with water and evolves CO2 gas

“B” Component

Viscosity, 77° F, cps., ASTM D-1638	600-1000
Physical State	Liquid
Color	Tan
Hygroscopicity	Absorbs water rapidly thus changing ratio

Reaction Profile (100 grams, 77° F sample)

Cream Time, seconds	1-4
Tack Free time, seconds	5-8
Rise Time, seconds	6-10

Processing

A System / B System, volume ratio	1.00 / 1.00
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Typical Physical Properties

Density, nominal, core, lbs/ft3 ASTM D-1622 @ 74° F	4-10
Compression Strength, ASTM D-1621 @ 74° F parallel rise; PSI	90-150
Closed Cell Content, % - ASTM 1940 @ 74° F	Over 90
Shear Strength, PSI - ASTM C-273 @ 74° F	225-250



MANUFACTURER:

- CONCRETE CONSERVATION, INC.-
- SPECTRA-SHIELD
- OPEN

RESTRICTIONS:

O 6 – PRECAST MANHOLES:

Effective Date: 01-01-2026

SPECIFICATION:

- Precast manhole shall meet or exceed the performance specifications of ASTM C478 & C913 for round structures.
- Openings shall be manufactured per ASTM C76, coring shall be specified per plans.
- Structure to be watertight and resist buoyant force.
- Standard manhole precast riser sections shall not exceed 4-feet; larger pump station wet well sections may be approved.
- Concrete shall conform to:
 - Compressive strength 4,000 psi @ 28-days
 - Air content 4% min.
 - Aggregate: ASTM C33
 - Cementitious materials: minimum of 564 lbs./yd³.
 - Free of organic impurities.
- Manholes 4-feet deep or less shall have an eccentric cone or a flat top.
- Manholes over 4-feet deep shall have an eccentric cone.
- Manholes shall have a minimum inside diameter of 4-feet for sewer mains 12-inches and smaller.
- Manholes shall be 5-feet for sewer mains larger than 12-inches.
- 5-foot manholes shall have an 8" extended base.
- 4-foot manholes shall have a 6" extended base.
- Extended bases shall have a minimum thickness of 6-inches.
- Manholes at ground level and located in traffic areas shall have anti-inflow inserts per Section K.
- Lift and handling devices shall have safety factor of 4 or greater.
- Corrosion linings as specified and indicated on design drawings.

SPECIFICATION (continued):

- Vents in remote or outfall areas shall be constructed of aluminum or 316 SST and shall extend a minimum of 2-feet above 100-year flood with integral non-corrosive insect screen.
- Vents in residential neighborhoods and commercial areas require special approval on a case-by-case basis.
- Watertight joints using ASTM C990 preformed flexible sealants.
- Pipe to manhole connections shall conform to ASTM C923 per Section H.
- Cylindrical wall seals per Section K.
- The location of the pipe connectors shall vary from the plans no more than 1/2-inch vertically and 5-degrees horizontally.



MANUFACTURES:

- OLD CASTLE
- TINDALL
- STAY-RIGHT
- ALCRETE
- OPEN

RESTRICTIONS:

O 6.1 – PRECAST WET WELL:

Effective Date: 01-01-2026

SPECIFICATION:

Precast wet wells for pump stations shall meet or exceed the preceding performance specifications of precast manhole with supplemental requirements as indicated below:

- Concrete 5,000 psi compressive strength @ 28-days.
- Minimum wall thickness shall be 5" for 5'-0", 6" for 6'-0" and 8" for 8'-0".
- Provide 1-inch cover all reinforcing steel.
- Base section shall include a 1'-0" extended base unless otherwise specified.
- All fasteners, wedge anchors, bolts, and hooks shall be 316 stainless steel.
- Support grip for each float and dower cord shall be "Hubbell" closed mesh series 024-17-xxx.
- Raintight aluminum hatch per design drawings, lockable with matching eye and padlock per Section I.
- Top shall be set as minimum of 2' above 100-year flood EL.
- Subject to leakage testing requirements per specifications.



• **MANUFACTURES:**

- OLD CASTLE
- TINDALL
- STAY-RIGHT
- ALCRETE
- OPEN

RESTRICTIONS:

O 6.2 – PRECAST VAULTS:

Effective Date: 01-01-2026

SPECIFICATION:

Precast concrete valve vaults shall meet or exceed the preceding requirements for precast manholes and with supplement requirements as indicated below:

- Conform to ASTM C913 & C890 for rectangular/square structures.
- Minimum 4' x 4' x 4' with a minimum base thickness of 6" and minimum wall thickness of 5".
- Live load rating of AASHTO HS20-44.
- Access hatches shall be pad lockable frame and cover, with a 1/4" watertight aluminum plate and 1/8" thick x 3" wide 316 stainless steel hinges per Section I.
- Step to be installed 18" below hatch on a non-hinged side.
- Shall be watertight structure. Subject to leakage testing requirements per specifications.



MANUFACTURES:

- OLD CASTLE
- TINDALL
- STAY-RIGHT
- ALCRETE
- OPEN

RESTRICTIONS:

O 6.3 - Polymer Concrete Manholes		Effective Date: <u>01-01-2026</u>
<p><u>SPECIFICATION:</u></p> <ul style="list-style-type: none"> • Shall meet or exceed the performance specification of ASTM D 6783, standard specification for polymer concrete. • Shall utilize FRP or steel reinforcement. • Shall meet or exceed the performance specification of ASTM C 478 for round structures. • Shall meet or exceed the performance specification of ASTM C 443 Standard Specification for Joints for Concrete Pipe and Manholes Using Rubber Gaskets. • Shall meet or exceed the performance specification of ASTM C 923 Standard Specifications for Resilient Connectors between Concrete Manholes Structures and Pipe per section H. • Shall meet or exceed the performance specification of ASTM C 497 Test Methods for Concrete Pipe, Manhole Sections, or Tile. • Structure to be watertight and resist buoyant force. • Standard manhole precast riser sections shall not exceed 4-feet; larger pump station wet well sections may be approved. • Manholes 4-feet deep or less shall have an eccentric cone or a flat top. • Manholes over 4-feet deep shall have an eccentric cone. • Manholes greater than 12' in depth shall be 5' in diameter. • Manholes shall have a minimum inside diameter of 4-feet for sewer mains 12-inches and smaller. • Manholes shall be 5-feet for sewer mains larger than 12-inches. 	<p><u>SPECIFICATION (continued):</u></p> <ul style="list-style-type: none"> • Manholes shall have anti-inflow inserts per Section K. • Lift and handling devices shall have safety factor of 4 or greater. • Vents in remote or outfall areas shall be constructed of aluminum or 316 SST and shall extend a minimum of 2-feet above 100-year flood with integral non-corrosive insect screen. • Vents in residential neighborhoods and commercial areas require special approval on a case-by-case basis. • Cylindrical wall seals per Section K. • The location of the pipe connectors shall vary from the plans no more than ½-inch vertically and 5-degrees horizontally. • All joint seams shall utilize gasket and mastic joint sealant rope. • Exterior manhole seams shall utilize exterior wrap or manufacturers grout product. • Annular voids shall be filled with grout product as follows: <ul style="list-style-type: none"> ○ Armorock – Polywux Grout ○ US Composite Pipe – A Series Cold Fusion (CFC) or Sikadur 42 Grout 	
<p><u>RESTRICTIONS:</u></p> <p>EOR to determine core locations meet state regulatory minimum design requirements.</p>	<p><u>MANUFACTURER:</u></p> <ul style="list-style-type: none"> • ARMOROCK • U.S. COMPOSITE PIPE -USCP 	



O 6.4 – CIP MANHOLE LINER/ SANITARY SEWER:

Effective Date: 01-01-2026
 Revision #: _____

SPECIFICATION:

CIP manhole liners shall meet or exceed the performance specifications of:

- CIP liner shall consist of a woven-roving fiberglass, felt, and an impermeable PVC inner membrane that is protected between 2 layers of fiberglass saturated with epoxy resin.
- CIP liner shall be waterproof and eliminate infiltration and filtration.
- CIP liner shall be custom fabricated to fit individual structure.
- CIP Liner may range from 100 mils to 250 mils depending on application.
- Shall meet ASTM Standards D 638, D 695, D 790, D 7234.
 - Ultimate Tensile Strength (ASTM D 638) : 8,764 to 14,465
 - Comp. (ASTM D695) : 9,115 to 11,924
 - Flexural Strength (ASTM D 790) : 18,096 to 29,374
 - Flexural Modulus (ASTM D 790) : 983,495 to 1,217,562



MANUFACTURER:

- Infastructure Rehab USA INC.
- OPEN

RESTRICTIONS: