

DATE OF PREPARATION: 5-JUN-15
 DEVELOPMENT: GRAND AVENUE LIFT STATION MODIFICATION SECTION 21, TOWNSHIP 34 SOUTH, RANGE 29 EAST
 OWNER: CITY OF SEBRING 166 SOUTH COMMERCE AVENUE SEBRING, FL 33870 (863) 386-5564 863-471-5100
 ENGINEER: ROGER DALE POLSTON, P.E. POLSTON ENGINEERING, INC. 2925 KENILWORTH BOULEVARD SEBRING, FL 33870 (863) 386-5564 (863) 385-2462 FAX

PIPE SPECIFICATION:
 SEWER FORCE MAIN FORCE MAINS - 4", 6", 8", 10" AND 12" AWWA APPROVED DUCTILE IRON ASTM D1784 (GREEN COLOR)
 FITTINGS 4" AND LARGER - CLASS 250 (MINIMUM) DUCTILE IRON MED-A-LUG ACCESSORIES
 1. ALL PIPE MATERIAL WILL BE AWWA OR ASTM STANDARD.
 2. ALL FORCE MAIN 4" - 12" WILL BE AWWA APPROVED DUCTILE IRON.
 3. ALL MEGA-LUG RESTRAINTS WILL BE DOMESTIC EBAA ONLY.
 4. ALL MATERIALS WILL BE FROM THE CITY OF SEBRING APPROVED MATERIALS LIST.
 5. ALL FITTINGS WILL BE MEGA-LUG.
 NOTE: EACH SUBCONTRACTOR WILL BE RESPONSIBLE FOR LOCATING AND VERIFYING ALL UTILITIES EFFECTED BY HIS WORK.

INSTALLATION INSTRUCTIONS:
 --THE SUBCONTRACTOR WILL BE RESPONSIBLE FOR TAKING ALL STEPS NECESSARY INCLUDING SHORING TO INSURE THE INTEGRITY OF THE ALL EXISTING PAVEMENTS, UTILITIES AND STRUCTURES AND BE RESPONSIBLE FOR REPLACEMENT OR REPAIR OF ANY DAMAGE CAUSED BY OR RELATED TO CONSTRUCTION OF WATERLINE.
 --THE PIPE SHALL BE BEDDED IN COMPACTED CLEAN SAND WITH ALL ORGANIC MATTER AND DEBRIS REMOVED.
 --SMALL FILL SHALL BE OF SIMILAR MATERIAL AND PLACED BY HAND AND COMPACTED BY TAMPING TO AT LEAST 12" OVER THE TOP OF THE PIPE.
 --ALL FILL TO BE CLEAN SAND AND TO BE PLACED IN APPROXIMATE 12" LAYERS AND IS TO BE COMPACTED BY ROLLING OR TAMING.
 --PIPE IS TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS, USING THE MANUFACTURER SPECIFIED JOINT LUBRICANTS AND CEMENTS IF REQUIRED.
 --ALL DISTURBED AREAS WITHIN THE CITY, COUNTY AND STATE R/W ARE TO BE RESTORED AND SODDED TO MATCH EXISTING SURROUNDING AREAS.
 --THE CONNECTION TO THE CITY OF SEBRING UTILITIES SEWER COLLECTION SYSTEM WILL BE DONE TO THE CITY OF SEBRING UTILITIES SPECIFICATIONS UNDER THE UTILITY DEPARTMENT SUPERVISION REQUIREMENTS.
 --THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ALL UTILITIES, ROADS AND STRUCTURES DAMAGED DURING THE DIRECTIONAL BORE OR JACK AND BORE CONSTRUCTION PHASE.
 TESTING:
 --ALL TESTS WILL REQUIRE THE PRESENCE OF THE ENGINEER, CONTRACTOR OR HIS DESIGNATED INSPECTOR.
 --A PERSON PRESENT TO BE DESIGNATED INSPECTOR FROM THE CITY OF SEBRING UTILITIES.
 --THE SUBCONTRACTOR SHALL TAKE ALL PRECAUTIONS TO SECURE A WATERTIGHT SEWAGE LINE UNDER ALL CONDITIONS.
 --ALL VISIBLE DAMAGE FLAWS SHALL BE REPAIRED OR REPLACED REGARDLESS OF THE OUT-COME OF ANY TESTING PERFORMED.
 --TEST SHALL BE PERFORMED PRIOR TO CONNECTION TO THE CITY OF SEBRING UTILITIES SEWER COLLECTION SYSTEM.

HYDROSTATIC TESTS
 1) ALL COMPONENTS OF THE FORCE MAIN SYSTEM, INCLUDING FITTINGS, SERVICES, CONNECTIONS, AND VALVES SHALL BE HYDROSTATIC TESTED TO SPECIFIC DISTRIBUTION SYSTEM COMPONENTS INCLUDING FITTINGS AND VALVES. SHALL REMAIN UNCOVERED UNTIL TESTED AND APPROVED. PROVIDED, HOWEVER, THAT PIPE TRENCHES UNDER TRAVELLED STREETS OR ROADS MAY BE BACKFILLED WITH THE PERMISSION OF THE PROJECT ENGINEER. NO TESTING SHALL BE DONE UNTIL ALL CONCRETE THRUST BLOCKING IS IN PLACE AND SET. IF HIGH EARLY STRENGTH CONCRETE IS USED, TESTING MAY BE CONDUCTED 48 HOURS AFTER THE CONCRETE IS PLACED. OTHERWISE, THRUST BLOCK CONCRETE MUST CURE 5 DAYS BEFORE PRESSURE TESTING COMMENCES. IN TESTING, THE PART OF THE SYSTEM UNDER TEST SHALL BE FILLED WITH POTABLE WATER AND SUBJECTED TO A SUSTAINED PRESSURE OF 150 PSI. THE PIPING SHALL BE TESTED IN SECTIONS, THEREBY TESTING EACH VALVE FOR LEAKAGE. WHILE THE SYSTEM IS BEING FILLED, AIR SHALL BE CAREFULLY AND COMPLETELY EXHAUSTED. IF PERMANENT AIR KNOTS ARE LOCATED AT ALL HIGH POINTS, THE CONTRACTOR SHALL INSTALL COPORATION STOPS OR FITTINGS AND VALVES AT SUCH POINTS SO THE AIR CAN BE EXPELLED AS THE PIPE SYSTEM IS SLOWLY FILLED WITH WATER.
 2) TEST PRESSURE SHALL BE MAINTAINED BY PUMPING FOR AT LEAST TWO HOURS AND UNTIL ALL SECTIONS UNDER TEST HAVE BEEN CHECKED FOR EVIDENCE OF LEAKAGE. RATE OF LOSS SHALL NOT EXCEED THAT SPECIFIED BELOW. "ALLOWABLE LIMITS FOR LEAKAGE," VISIBLE LEAKS SHALL BE CORRECTED REGARDLESS OF TOTAL LEAKAGE SHOWN BY TEST.
 3) THE SYSTEM AS A WHOLE, OR ANY PART, SHALL BE TESTED PRIOR TO CONSTRUCTION OF ANY SUBDIVISION ROADWAY OR PAVEMENT OVER THE WATER SYSTEM.
 4) THE SYSTEM AS A WHOLE, OR ANY PART, SHALL BE TESTED AFTER COMPLETION OF BACKFILL AND UNDER THE SUPERVISION OF A REPRESENTATIVE OF THE PROJECT ENGINEER. THE SYSTEM SHALL ALSO BE TESTED UPON COMPLETION OF SUBDIVISION ROADWAY OR OTHER PAVEMENT CONSTRUCTION THAT IS CONSTRUCTED OVER THE WATER SYSTEM.
 5) ALL PUMPS, GAUGES, AND MEASURING DEVICES SHALL BE FURNISHED, INSTALLED, AND OPERATED BY THE CONTRACTOR AND ALL SUCH EQUIPMENT AND DEVICES AND THEIR INSTALLATION SHALL BE APPROVED BY THE PROJECT ENGINEER. ALL PRESSURES AND LEAKAGE TESTING SHALL BE DONE IN THE PRESENCE OF A REPRESENTATIVE OF THE ENGINEER.
 6) WATER FOR TESTING SHALL BE POTABLE WATER PROVIDED BY THE CONTRACTOR FROM A SOURCE APPROVED BY THE PROJECT ENGINEER.
 THE HYDROSTATIC PRESSURE TESTS SHALL BE PERFORMED AS SPECIFIED AND NO INSTALLATION, OR SECTION THEREOF, WILL BE ACCEPTABLE UNTIL THE LEAKAGE IS LESS THAN THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FORMULA:

$L = \frac{ND \cdot P}{7.48D}$
 IN WHICH:
 L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
 N = APPROXIMATE NUMBER OF JOINTS IN THE SECTION TO BE TESTED
 D = PIPE DIAMETER, IN INCHES
 P = THE AVERAGE TEST PRESSURE DURING THE TEST, IN GAUGE PSI

SCOPE OF WORK:
 RENOVATE AN EXISTING LIFT STATION WITH NEW SEWAGE PUMPS (INCLUDING PUMP BASE, PUMP GUIDE RAILS, LIFTING CABLES, BASE SLATE)
 2. NEW DISCHARGE PIPING FROM THE PUMPS THROUGH THE VALVE BOX TO THE FORCE MAIN EXISTING THE VALVE BOX
 3. NEW FLOATS FOR CONTROLLING PUMPS
 4. NEW DRAIN PIPE THROUGH VALVE BOX AND LIFT STATION
 5. REPLACE VALVES/MANIFOLD/ELBOWS/BLIND FLANGE WITHIN THE VALVE BOX
 6. NEW JUNCTION BOX
 7. NEW ELECTRICAL CONDUIT FROM THE LIFT STATION TO THE NEW JUNCTION BOX
 8. MODIFY THE PANEL BOX (WIRING/CONDUIT BETWEEN THE NEW JUNCTION BOX TO PANEL BOX, REMOVE/RELOCATE/REWIRE (WIRING AND CONDUIT) "DATAFLOW" CONTROLLER TO NEW "DATAFLOW" CONTROLLER BOX ATTACHED TO THE TELEMETRY ANTENNA, PAINT PANEL BOX EXTERIOR WHITE OR REPLACE PANEL BOX IF REQUIRED FOR ALTERNATE PUMPS, ADD FLOOD LIGHT)
 9. ADD 31" OF TYPE "D" CURBING ALONG GRAND AVENUE
 10. REPLACE THE EXISTING LIFT STATION LID AND RAISE THE NEW LID 8"
 11. REPLACE THE EXISTING VALVE BOX LID AND RAISE THE NEW LID 8"
 12. ADD 5'x5'x8" CONCRETE SLAB ADJACENT TO THE LIFT STATION
 13. REPLACE ADJACENT GRADE TO SLOPE AWAY FROM NEW FINISHED CONCRETE GRADES
 14. CLEAN AND LINE THE INTERIOR OF THE EXISTING LIFT STATION WITH QML, SEWEP COAT OR OTHER APPROVED EQUIVALENT
 15. REGRADE AND SOD ROAD SIDE SWALES 50' MINIMUM PARALLEL WITH GRAND AVENUE TO ACCOMMODATE ROAD RUNOFF

LIFT STATION SCOPE OF WORK:
 1. THE CONTRACTOR WILL SUPPLY THE PUMPS, BASE FLANGES, DISCHARGE PIPES, RAILS, LIFTING CHAIN, ELECTRICAL COMPONENTS, JUNCTION BOX, PIPING, VALVES, FLANGES, FLOATS, ETC. THE CONTRACTOR WILL BE REQUIRED TO SUPPLY ALL SUPPLIES, MATERIALS AND EQUIPMENT FOR A FULLY OPERATIONAL LIFT STATION. CONTRACTOR WILL NOTIFIED THE SERVICES OF A LICENSED ELECTRICIAN. THE ENGINEER OF RECORD MUST BE NOTIFIED ON ANY CHANGES OR MODIFICATIONS FOR APPROVAL.
 2. THE SYSTEM IS ACTIVE. THE CONTRACTOR WILL BE RESPONSIBLE FOR KEEPING THE SYSTEM FUNCTIONING DURING CONSTRUCTION. THIS MAY INCLUDE BYPASS PUMPING.
 3. ALL WORK MUST BE COORDINATED WITH THE ENGINEER OF RECORD AND THE CITY OF SEBRING PRIOR TO ANY CONSTRUCTION.
 4. THE CONTRACTOR WILL CONSTRUCT THE MODIFICATIONS TO THE GRAND AVE LIFT STATION WITHIN THE GRAND AVENUE ROAD RIGHT-OF-WAY.
 5. CONCRETE SHALL BE 4000 PSI COMPACTED WITH THE SAME TYPE OF GRASS.
 6. THE CONTRACTOR WILL RESTORE THE RIGHT-OF-WAYS TO EXISTING GRADE AND ALL DISTURBED AREAS ARE TO BE SODDED WITH THE SAME TYPE OF GRASS.
 7. ALL FITTINGS WILL BE MEGA LUG STYLE AS PER THE CITY OF SEBRING REQUIREMENTS.
 8. THE CONTRACTOR WILL PROVIDE, FOR APPROVAL, A METHOD OF BYPASSING THE LIFT STATION TO THE ENGINEER OF RECORD AND THE CITY OF SEBRING.
 NOTES:
 1. THE SITE WILL BE GRADED AWAY FROM THE LIFT STATION.
 2. REFER TO THE CITY OF SEBRING "WASTEWATER MATERIALS SPECIFICATION" LIST FOR APPROVED PRODUCT BRANDS AND MODELS.
 3. CONCRETE SHALL BE CONCRETE WITH TYPE II CEMENT. CONCRETE SURFACES SHALL RECEIVE A LINER AS STATED.
 4. ALL REINFORCED CONCRETE STRUCTURES SHALL BE IN ACCORDANCE WITH ACI CODE 318. STEEL YIELD STRENGTH SHALL BE 60,000 PSI (GRADE 60). WET WELL WALL SHALL CONFORM TO EITHER:
 A. CAST IN PLACE #5 RE-BAR@12" O.C.B.W. IN THE CENTER 1/3 OR B. PRE CAST SECTIONS: ASTM C478
 5. UPPER SLABS SHALL BE POSITIVELY JOINED TO WET WELL WALL.
 6. CAST IRON SADDLE IN THE DISCHARGE PIPING SHALL SUPPORT A 2.5" MINIMUM SIZE LIQUID FILLED PRESSURE GAUGE INSTALLED WHERE INDICATED.
 7. BY-PASS CONNECTION TO BE BRASS QUICK-DISCONNECT TYPE, PART "D" FEMALE COUPLER AND PART "W" PLUG.
 8. NON-SHRINK GROUT SHALL SEAL AROUND ALL PIPE UNLESS SPECIFIED OTHERWISE BY THE CITY.
 9. GROUNDING SHALL BE TWO #4 COPPER-CLAD GROUNDING RODS, MINIMUM 8 FEET LONG AND 6 FEET APART, CONNECTED 12" BELOW GROUND LEVEL. CONDUCTORS SHALL BE #4 SOLID COPPER AND CONNECTORS SHALL BE CADWELD, BOLT CLAMP OR SPLIT CLAMP.
 10. TOP OF SLAB TO BE A MINIMUM OF 6" ABOVE FINISH GRADE, AND DRAINAGE SHALL BE AWAY FROM THE LIFT STATION.
 11. PUMP BASE ANCHOR BOLT LOCATION AND SIZE SHALL BE PER MANUFACTURER'S SHOP DRAWING.
 12. FACE AND TOP OF POWER PANEL AND RTU TO BE FLUSH.
 13. CONDUITS (ALL 2") SHALL HAVE A MINIMUM 24" OF COVER. WITH THE EXCEPTION OF POWER SUPPLY CONDUIT, IN WHICH CASE THE COVER SHALL BE MINIMUM 42".
 14. CONDUIT SHALL BE AS FOLLOWS:
 ABOVE GRADE - RIGID ALUMINUM
 BELOW GRADE - RIGID ALUMINUM OR SCH 80 PVC
 15. ALL FANCHORS SHALL BE HILTI TYPE 316 SS OR APPROVED EQUAL WITH TYPE 316 SS FASTENERS.
 16. ALL APPROVALS AND SUBMISSIONS SHALL BE TO THE ENGINEER AND THE CITY OF SEBRING, WITH FINAL AUTHORITY RESING WITH THE CITY OF SEBRING.
 NOTE:
 QML AND GREEN MONSTER LINER IS A TRADEMARK LINER AND IS USED ON THIS PLAN AS AN IDENTIFIER. SEWEP COAT LINING IS AN ALTERNATE LINING SYSTEM. A PRODUCT EQUIVALENT IN NATURE AND QUALITY MAY BE USED AS A SUBSTITUTE WITH THE PRIOR APPROVAL OF THE CITY OF SEBRING AND THE ENGINEER OF RECORD.
 --THIS PROJECT IS NOT SUBJECT TO FLOODING IN A 25-YEAR OR 100-YEAR REOCCURENCE INTERVAL STORM.
 --DEWATERING MAY BE REQUIRED, THE CONTRACTOR SHALL PROVIDED DEWATERING AS NECESSARY FOR THIS PROJECT.
 --THE SYSTEM IS ACTIVE SO THE CONTRACTOR WILL PROVIDE BYPASS PUMPING AS REQUIRED TO COMPLETE THE PROJECT WITHOUT INTERRUPTING SERVICE.
 --CONCRETE SHALL BE MAINTAINED TO A MAINTENANCE OF TRAFFIC PLAN TO HIGHLANDS COUNTY AS APPROPRIATE FOR CONSTRUCTION WITHIN THE RIGHT-OF-WAYS.
 --THE CONTRACTOR WILL CONSTRUCT A COMPLETE FUNCTIONING PROJECT.

GENERAL CHARACTERISTICS
 COMPRISED ENTIRELY OF CALCIUM ALUMINATES, SEMPERCOAT® IS A PRE-PACKAGED READY TO USE, FIBER REINFORCED, HIGH STRENGTH WET SHOTCRETE MATERIAL. SEMPERCOAT® IS A MORTAR THAT IS DESIGNED TO COAT BOTH NEW AND EXISTING MUNICIPAL WASTEWATER STRUCTURES INCLUDING MANHOLES, LIFT STATIONS, WET WELLS, ETC. IT IS DESIGNED SPECIALLY TO PROVIDE AN ABRASION AND CORROSION-RESISTANT, PROTECTIVE LINING THAT CAN WITHSTAND SEVERE BIOLOGIC CORROSION CAUSED BY THE HYDROGEN SULFIDE (H₂S) FOUND IN WASTEWATER ENVIRONMENTS.
 THE UNIQUE PROPERTIES OF SEMPERCOAT® RESULT FROM THE CHEMICAL AND MINERAL PHASES FORMED DURING THE HYDRATION PROCESS. SEMPERCOAT® IS UNIQUE WHEN COMPARED TO OTHER MATERIALS SUCH AS PORTLAND CEMENT (OPC) CONCRETE, EPOXIES, POLY-VINYL CHLORIDE (PVC) OR POLYETHYLENE, BECAUSE OF ITS CAPACITY TO INHIBIT BACTERIAL ACTIVITY BY EFFECTIVELY NEUTRALIZING SULFURIC ACID PRODUCTION.
 SEMPERCOAT® IS AN ADHESIVE MORTAR THAT POSSESSES THIN SECTION THICKNESS AS WELL AS HIGH COMPRESSIVE AND FLEXURAL STRENGTHS. ADDITIONAL FEATURES INCLUDE HIGH EARLY STRENGTH, FREEZE-THAW RESISTANCE AS WELL AS HIGH TEMPERATURE RESISTANCE (UP TO 1000°F). SEMPERCOAT® IS ALSO RESISTANT TO MANY OTHER TYPES OF CORROSION INCLUDING SULFATES, SEAWATER, OILS, GASES, AND DILUTE ACIDS (PH RANGE 3.5 - 11).
 SEMPERCOAT® DOES NOT RELEASE CALCIUM HYDROXIDE AS A HYDRATION PRODUCT. THIS IMPARTS GOOD CHEMICAL RESISTANCE AND ELIMINATES THE MAJOR CAUSE OF EFFLORESCENCE.
 SEMPERCOAT® IS A VERY DARK GRAY COLOR.
 SEMPERCOAT® DOES NOT CONTAIN CRYSTALLINE SILICA.
 *MATERIAL PROPERTIES (DETERMINED BY AN INDEPENDENT TESTING LABORATORY):
 ASTM C 109 COMPRESSIVE STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 293 FLEXURAL STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 596 SHRINKAGE AT 90% HUMIDITY, % 24 HRS 28 DAYS
 ASTM C 286 FREEZE-THAW AFTER 300 CYCLES NO DAMAGE
 ASTM C 496 SPLITTING TENSILE STRENGTH PSI 28 DAYS
 ASTM C 286 BOND STRENGTH GREEN MONSTER™ SHALL ONLY BE APPLIED WITH A MINIMUM OUTPUT PRESSURE OF 2,500 PSIG > 2,300 PSI @ 28 DAYS
 ASTM C 457 AIR VOID CONTENT (7 DAYS) 2-4%
 ASTM C 642 SPECIFIC GRAVITY (ABSORPTION TEST (7 DAYS) 3-5%
 CLASSIC MODULUS OF ELASTICITY (24 HRS) 7.1 X 10⁶ PSI
 *THE TEST RESULTS ABOVE WERE OBTAINED UNDER STANDARD LABORATORY CONDITIONS AND ARE PRESENTED AS TYPICAL MATERIAL PROPERTIES ONLY. THOSE PROPERTIES PRESENTED ABOVE ARE NOT WARRANTED OR GUARANTEED BY KERNEOS. PROPERTIES OBTAINED FROM FIELD CAST SPECIMENS MAY RESULT IN VALUES LOWER THAN THOSE LISTED ABOVE. THE WARRANTED MATERIAL PROPERTIES ARE PRESENTED IN SECTION TWO OF THIS PRODUCT DATA SHEET.

2. SPECIFICATIONS
 SEMPERCOAT® IS SOLD AND DISTRIBUTED BY KERNEOS INC. ADHERES TO THE FOLLOWING SPECIFICATIONS:
 SPEC ANALYSIS
 # 8 (2.36 mm) 0 MN (%) MAX (%)
 # 10 (1.18 mm) 1.5 9.5
 # 20 (840 mm) 22 32
 # 30 (160 mm) 15 25
 # 40 (85 mm) 8 12
 # 100 (150 mm) 48 62
 # 200 (75 mm) 52 68
 # 400 (100 mm) 52 68
 MORTAR PROPERTIES (USING 14.5% WATER)
 1. VIBRATION TIME 1.0 MIN. 120 - 160"
 2. SET TIME 4 - 10 HOURS
 3. COMPRESSIVE STRENGTH @ 24 HOURS 5500 - 11000 PSI
 FOR DETAILED TEST PROCEDURES, PLEASE CONTACT A KERNEOS TECHNICAL OR QUALITY MANAGER.
 3. TECHNICAL ASSISTANCE
 SEMPERCOAT® WITHSTANDS CORROSIVE ENVIRONMENTS CONTAINING H₂S GAS, WHICH SHOWS STRONG THIOBACILLUS BACTERIAL ACTIVITY. DUE TO ITS HIGH NEUTRALIZATION CAPACITY, SEMPERCOAT® HAS BEEN SHOWN TO LOCALLY RAISE THE SURFACE PH FOUND ON THE SURFACE OF WASTEWATER STRUCTURES AND PREVENTS THE SUCCESSFUL COLONIZATION OF THE MOST AGGRESSIVE STRAINS OF BACTERIA.
 ABRASION RESISTANCE: U.S. ARMY CORPS OF ENGINEERS TEST CRD-C-63-80. TEST METHOD FOR ABRASION-EROSION RESISTANCE OF CONCRETE, RESULTED IN 0.0% WEIGHT LOSS AFTER 12 HOURS OF TESTING AND 0.8% WEIGHT LOSS AFTER 72 HOURS OF TESTING. TYPICAL 5,000-PSI HIGH-PERFORMANCE OPC CONCRETE EXPERIENCED A 3.6% WEIGHT LOSS AFTER ONLY 12 HOURS OF TESTING. SEMPERCOAT® APPROXIMATELY SEVEN TIMES MORE RESISTANT TO THIS TYPE OF ABRASION THAN HIGH-PERFORMANCE OPC CONCRETE.
 AGGREGATE SIZE: #14 MESH AND FINER (0 - 1.4MM)
 WET DENSITY AT 68°F: 148-155 LB./FT³ (2.4 - 2.5 G/CC)
 COEFFICIENT OF THERMAL EXPANSION: 5 x 10⁻⁶ in./in./°F (68°F TO 1832°F)
 4. CHEMICAL COMPOSITION
 SEMPERCOAT® IS A BLEND OF CALCIUM SULFATE, CALCIUM CHLORIDE, TRICALCIUM ALUMINATE, LIME HYDRATES OR AGGRESSIVE AGENTS THAT ATTACK REINFORCING STEEL. THE HIGH-PERFORMANCE PROPERTIES OF SEMPERCOAT® ARE ACHIEVED THROUGH A BLEND OF MINERAL ELEMENTS.
 CHEMICAL ANALYSIS MAIN COMPONENTS
 Al₂O₃ CaO Fe₂O₃ SO₂
 41% - 46% 33% - 38% 8% - 13% 4% - 9%

5. INSTALLATION
 CLEAN, POTABLE WATER SHOULD BE USED FOR MIXING. THE WATER REQUIREMENT IS PROVIDED ON EACH INDIVIDUAL BAG AND IS CRITICAL TO OBTAIN THE SPECIFIED PERFORMANCE PROPERTIES. ALWAYS STAY WITHIN THE RECOMMENDED SPECIFICATIONS FOR MIXING WATER.
 SEMPERCOAT® PRODUCTS ARE NOT DESIGNED TO BE HANDAPPLIED. SEMPERCOAT® IS DESIGNED TO BE APPLIED WITH LOW-PRESSURE, WET-SPRAY EQUIPMENT. PREPARATION OF THE SURFACE TO BE COATED SHOULD BE PERFORMED IN ACCORDANCE WITH APPLICABLE INDUSTRY STANDARDS AND SPECIFIC PROJECT SPECIFICATION REQUIREMENTS. SANDBLASTING AND/OR HYDRO-BLASTING WITH HIGH-PRESSURE WATER MAY BE USED TO REMOVE EXISTING DETRIMENTATION AND DEBRIS. THE IMMEDIATE BONDING OF SEMPERCOAT® TO THE SURFACE OF ANY EXISTING COATINGS, SEWER RESIDUE, AND RUNNING WATER, THE STRUCTURE ITSELF SHOULD BE FULLY SATURATED PRIOR TO A SEMPERCOAT® INSTALLATION. PLEASE SEE OUR SUGGESTED SEMPERCOAT® SPECIFICATION LANGUAGE FOR DETAILED SURFACE PREPARATION RECOMMENDATIONS.
 SEMPERCOAT® PRODUCTS ARE TO BE APPLIED TO SURFACES WITH NO CIRCUMSTANCES OTHER THAN WATER. BE ADDED TO SEMPERCOAT® PRODUCTS. SEMPERCOAT® SHOULD NOT BE USED AS A "BUILD-OUT" MIX OR UNDERLAYMENT FOR ANY OTHER PRODUCT. SEMPERCOAT® SHOULD NOT BE USED IN CONJUNCTION WITH OR ADJACENT TO ANY MORTAR OR GROUT COATINGS, INCLUDING BUT NOT LIMITED TO EPOXY, POLYURETHANE, POLYUREA, AND FIBERGLASS. CURING SHOULD BE IMPLEMENTED AS SOON AS THE SURFACE BEGINS TO HARDEN AND DRY (AS EARLY AS ONE HOUR AFTER APPLICATION). SEVERAL LAYERS OF ASTM C309 LIQUID MEMBRANE CURING COMPOUND OR A 100%-HUMID MOISTURE CURE MAY BE USED.
 EQUIPMENT USED MUST ALWAYS BE CLEAN AND FREE OF PORTLAND CEMENT BUILD-UP TO AVOID ACCELERATED SET.
 GENERALLY ACCEPTED CONCRETING PRACTICES (WATER RATIO PER BAG, COMPACTION, CURING, ETC.) SHOULD BE EMPLOYED TO OBTAIN THE BEST QUALITY INSTALLATION WITH RESPECT TO MECHANICAL STRENGTH AND CORROSION RESISTANCE.
 6. AVAILABILITY
 SEMPERCOAT® IS AVAILABLE IN NORTH AMERICA DIRECTLY THROUGH KERNEOS INC. MAIN OFFICE AND WAREHOUSES.
 SEMPERCOAT® IS PACKAGED IN VARIOUS BAG SIZES DEPENDING UPON APPLICATION AND INSTALLATION METHODS. SEMPERCOAT® IS TYPICALLY SUPPLIED PALLETIZED IN 65-LB BAGS.
 FOR MORE INFORMATION ABOUT SEMPERCOAT®, INCLUDING A LIST OF INSTALLERS, PLEASE CONTACT KERNEOS INC. AT 1-800-524-8463.
 7. TECHNICAL ASSISTANCE
 A LICENSED PROFESSIONAL ENGINEER IS RESPONSIBLE FOR THE DETERMINATION OF SUITABILITY, OVERALL DESIGN, SPECIFICATIONS AND FOLLOW UP FOR EACH PROJECT. KERNEOS INC. HAS A TECHNICAL ASSISTANCE DEPARTMENT WITH ON-SITE LABORATORY FACILITIES AVAILABLE TO PROVIDE CUSTOMER SUPPORT. KERNEOS ASSISTANCE IN TECHNICAL PLANNING AND INSTALLATION OF A PROJECT DOES NOT WARRANT THE SUCCESS OF ANY APPLICATION AND IS NOT A SUBSTITUTE FOR PROFESSIONAL ENGINEERING ADVICE.
 8. PACKAGING & SHELF LIFE
 SEMPERCOAT® IS AVAILABLE PALLETIZED IN 65-LB BAGS. SEMPERCOAT® PACKAGING IS DESIGNED TO PROTECT IT FROM HUMIDITY. HOWEVER, AS WITH ALL PREPACKAGED CONCRETES, SEMPERCOAT® SHOULD NOT BE PLACED IN DIRECT CONTACT WITH THE GROUND. WHEN CORRECTLY STORED IN DRY CONDITIONS, THE PROPERTIES OF SEMPERCOAT® SHOULD REMAIN WITHIN SPECIFICATION LIMIT FOR AT LEAST 6 MONTHS. IN MOST CASES, ITS PROPERTIES WILL BE MAINTAINED FOR OVER A YEAR.
 SEMPERCOAT® 10 YEAR LIMITED WARRANTY (OWNER)
 THIS WARRANTY EXTENDS TO THE OWNER OF THE STRUCTURE TO WHICH SEMPERCOAT® IS APPLIED, EFFECTIVE AS OF THE OWNER'S ACCEPTANCE OF THE WORK. KERNEOS WARRANTS TO THE OWNER THAT SEMPERCOAT®, WHEN INSTALLED IN COMPLIANCE WITH THE RECOMMENDED INSTALLATION GUIDELINES PUBLISHED BY KERNEOS, WILL PROTECT SANITARY WASTEWATER STRUCTURES FROM BIOLOGIC CORROSION CAUSED BY EXPOSURE TO SANITARY SEWAGE ENVIRONMENT TO BE HONORED. CLAIMS MUST BE FILED BY THE OWNER WITHIN 10 YEARS OF ACCEPTANCE OF THE WORK BY OWNER. KERNEOS OBLIGATIONS HEREUNDER EXTEND ONLY TO PROVIDING LABOR AND MATERIAL TO REPLACE THE DEFECTIVE MATERIAL.
 THIS WARRANTY EXCLUDES CONSEQUENTIAL AND INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGE TO EQUIPMENT AND PERIPHERAL FACILITIES, SERVICE INTERRUPTION, LOSS OF PROFITS, AND THE LIKE). THIS WARRANTY APPLIES TO SANITARY SEWAGE EXPOSURE ONLY. EXPOSURE TO EFFLUENT, CHEMICALS, OR CONTAMINANTS FROM INDUSTRIAL DISCHARGE WILL VOID THIS LIMITED WARRANTY.
 SEMPERCOAT® (LIMITED WARRANTY) (BUYER)
 KERNEOS WARRANTS TO THE BUYER OF THIS PRODUCT THAT, AT THE TIME OF SHIPMENT, THE PRODUCT CONFORMS TO THE SPECIFICATIONS SET FORTH IN SECTION 2 OF THE APPLICABLE PRODUCT DATA SHEET. TO BE HONORED, CLAIMS UNDER THIS WARRANTY MUST BE FILED BY THE BUYER WITHIN 30 DAYS OF USE OF THE PRODUCT OR 6 MONTHS OF DELIVERY TO ITS BUYER, WHICHEVER COMES FIRST. KERNEOS'S OBLIGATION AND THE SOLE AND EXCLUSIVE REMEDY OF BUYER UNDER THIS WARRANTY SHALL BE THE REPLACEMENT OF ANY NONCONFORMING PRODUCT, OR, AT KERNEOS OPTION, THE REFUND OF THE PURCHASE PRICE PAID BY ITS BUYER.
 THERE ARE NO WARRANTIES EXPRESS OR IMPLIED, TO OWNER OR BUYER EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. NO WARRANTY IS GIVEN FOR, OR MAY BE IMPLIED FROM, ANY TECHNICAL ADVICE, OR RECOMMENDATIONS PROVIDED BY KERNEOS.
 WARRANTY CLAIM PROCEDURE
 KERNEOS RESERVES THE RIGHT TO INSPECT AND DETERMINE WHETHER ANY CLAIM IS THE RESULT OF A BREACH OF A WARRANTY SET FORTH HEREIN OR IS RELATED TO ANOTHER CAUSE (ALL OTHER CAUSES ARE EXPRESSLY EXCLUDED FROM COVERAGE BY THE WARRANTIES CONTAINED HEREIN).
 ANY CLAIM UNDER THIS LIMITED WARRANTY REQUIRING AN INVESTIGATION BY KERNEOS MAY REQUIRE EXTENSIVE LABORATORY TESTING. IT IS THE RESPONSIBILITY OF ANY PARTY MAKING A CLAIM TO MAKE ANY PRODUCT OR STRUCTURE REQUIRING TESTING ACCESSIBLE AND AVAILABLE TO KERNEOS WITHIN A REASONABLE PERIOD OF TIME AFTER A CLAIM ARISES. INSPECTION, INCLUDING THICKNESS VERIFICATION AND THE GATHERING OF SPECIMENS FOR TESTING MAY REQUIRE THE REMOVAL OF A PORTION OF THE SEMPERCOAT® LINING. IF A QUESTION OR, IF A STRUCTURE REQUIRING INVESTIGATION CANNOT BE MADE READILY ACCESSIBLE, THE REMOVAL OF ANY FRAMES, COVERS, OR OBSTRUCTIONS, AT KERNEOS OPTION, TECHNICAL INVESTIGATIONS AND TESTING MAY BE PERFORMED BY EITHER KERNEOS INTERNAL FACILITIES OR BY AN INDEPENDENT AGENCY.
 IT IS THE RESPONSIBILITY OF THE CUSTOMER TO MAINTAIN AND DOCUMENT PRODUCT INSTALLATION AND JOB ACCEPTANCE REPORTS IN ACCORDANCE WITH ALL APPLICABLE INSTRUCTIONS INCLUDING, WITHOUT LIMITATION, THE LOCATION AND DATE, THE QUANTITIES INSTALLED, THE MIXING METHODS, SURFACE PREPARATION PROCEDURES USED, INSTALLATION PERSONNEL, AND EXISTING CONDITIONS OF THE STRUCTURE, INCLUDING H₂S CONCENTRATIONS AND INITIAL SURFACE PH. KERNEOS WILL PROVIDE INSTALLATION REPORT FORMS UPON REQUEST.

1. GENERAL CHARACTERISTICS
 COMPRISED ENTIRELY OF CALCIUM ALUMINATES, SEMPERCOAT® IS A PRE-PACKAGED READY TO USE, FIBER REINFORCED, HIGH STRENGTH WET SHOTCRETE MATERIAL. SEMPERCOAT® IS A MORTAR THAT IS DESIGNED TO COAT BOTH NEW AND EXISTING MUNICIPAL WASTEWATER STRUCTURES INCLUDING MANHOLES, LIFT STATIONS, WET WELLS, ETC. IT IS DESIGNED SPECIALLY TO PROVIDE AN ABRASION AND CORROSION-RESISTANT, PROTECTIVE LINING THAT CAN WITHSTAND SEVERE BIOLOGIC CORROSION CAUSED BY THE HYDROGEN SULFIDE (H₂S) FOUND IN WASTEWATER ENVIRONMENTS.
 THE UNIQUE PROPERTIES OF SEMPERCOAT® RESULT FROM THE CHEMICAL AND MINERAL PHASES FORMED DURING THE HYDRATION PROCESS. SEMPERCOAT® IS UNIQUE WHEN COMPARED TO OTHER MATERIALS SUCH AS PORTLAND CEMENT (OPC) CONCRETE, EPOXIES, POLY-VINYL CHLORIDE (PVC) OR POLYETHYLENE, BECAUSE OF ITS CAPACITY TO INHIBIT BACTERIAL ACTIVITY BY EFFECTIVELY NEUTRALIZING SULFURIC ACID PRODUCTION.
 SEMPERCOAT® IS AN ADHESIVE MORTAR THAT POSSESSES THIN SECTION THICKNESS AS WELL AS HIGH COMPRESSIVE AND FLEXURAL STRENGTHS. ADDITIONAL FEATURES INCLUDE HIGH EARLY STRENGTH, FREEZE-THAW RESISTANCE AS WELL AS HIGH TEMPERATURE RESISTANCE (UP TO 1000°F). SEMPERCOAT® IS ALSO RESISTANT TO MANY OTHER TYPES OF CORROSION INCLUDING SULFATES, SEAWATER, OILS, GASES, AND DILUTE ACIDS (PH RANGE 3.5 - 11).
 SEMPERCOAT® DOES NOT RELEASE CALCIUM HYDROXIDE AS A HYDRATION PRODUCT. THIS IMPARTS GOOD CHEMICAL RESISTANCE AND ELIMINATES THE MAJOR CAUSE OF EFFLORESCENCE.
 SEMPERCOAT® IS A VERY DARK GRAY COLOR.
 SEMPERCOAT® DOES NOT CONTAIN CRYSTALLINE SILICA.
 *MATERIAL PROPERTIES (DETERMINED BY AN INDEPENDENT TESTING LABORATORY):
 ASTM C 109 COMPRESSIVE STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 293 FLEXURAL STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 596 SHRINKAGE AT 90% HUMIDITY, % 24 HRS 28 DAYS
 ASTM C 286 FREEZE-THAW AFTER 300 CYCLES NO DAMAGE
 ASTM C 496 SPLITTING TENSILE STRENGTH PSI 28 DAYS
 ASTM C 286 BOND STRENGTH GREEN MONSTER™ SHALL ONLY BE APPLIED WITH A MINIMUM OUTPUT PRESSURE OF 2,500 PSIG > 2,300 PSI @ 28 DAYS
 ASTM C 457 AIR VOID CONTENT (7 DAYS) 2-4%
 ASTM C 642 SPECIFIC GRAVITY (ABSORPTION TEST (7 DAYS) 3-5%
 CLASSIC MODULUS OF ELASTICITY (24 HRS) 7.1 X 10⁶ PSI
 *THE TEST RESULTS ABOVE WERE OBTAINED UNDER STANDARD LABORATORY CONDITIONS AND ARE PRESENTED AS TYPICAL MATERIAL PROPERTIES ONLY. THOSE PROPERTIES PRESENTED ABOVE ARE NOT WARRANTED OR GUARANTEED BY KERNEOS. PROPERTIES OBTAINED FROM FIELD CAST SPECIMENS MAY RESULT IN VALUES LOWER THAN THOSE LISTED ABOVE. THE WARRANTED MATERIAL PROPERTIES ARE PRESENTED IN SECTION TWO OF THIS PRODUCT DATA SHEET.

2. SPECIFICATIONS
 SEMPERCOAT® IS SOLD AND DISTRIBUTED BY KERNEOS INC. ADHERES TO THE FOLLOWING SPECIFICATIONS:
 SPEC ANALYSIS
 # 8 (2.36 mm) 0 MN (%) MAX (%)
 # 10 (1.18 mm) 1.5 9.5
 # 20 (840 mm) 22 32
 # 30 (160 mm) 15 25
 # 40 (85 mm) 8 12
 # 100 (150 mm) 48 62
 # 200 (75 mm) 52 68
 # 400 (100 mm) 52 68
 MORTAR PROPERTIES (USING 14.5% WATER)
 1. VIBRATION TIME 1.0 MIN. 120 - 160"
 2. SET TIME 4 - 10 HOURS
 3. COMPRESSIVE STRENGTH @ 24 HOURS 5500 - 11000 PSI
 FOR DETAILED TEST PROCEDURES, PLEASE CONTACT A KERNEOS TECHNICAL OR QUALITY MANAGER.
 3. TECHNICAL ASSISTANCE
 SEMPERCOAT® WITHSTANDS CORROSIVE ENVIRONMENTS CONTAINING H₂S GAS, WHICH SHOWS STRONG THIOBACILLUS BACTERIAL ACTIVITY. DUE TO ITS HIGH NEUTRALIZATION CAPACITY, SEMPERCOAT® HAS BEEN SHOWN TO LOCALLY RAISE THE SURFACE PH FOUND ON THE SURFACE OF WASTEWATER STRUCTURES AND PREVENTS THE SUCCESSFUL COLONIZATION OF THE MOST AGGRESSIVE STRAINS OF BACTERIA.
 ABRASION RESISTANCE: U.S. ARMY CORPS OF ENGINEERS TEST CRD-C-63-80. TEST METHOD FOR ABRASION-EROSION RESISTANCE OF CONCRETE, RESULTED IN 0.0% WEIGHT LOSS AFTER 12 HOURS OF TESTING AND 0.8% WEIGHT LOSS AFTER 72 HOURS OF TESTING. TYPICAL 5,000-PSI HIGH-PERFORMANCE OPC CONCRETE EXPERIENCED A 3.6% WEIGHT LOSS AFTER ONLY 12 HOURS OF TESTING. SEMPERCOAT® APPROXIMATELY SEVEN TIMES MORE RESISTANT TO THIS TYPE OF ABRASION THAN HIGH-PERFORMANCE OPC CONCRETE.
 AGGREGATE SIZE: #14 MESH AND FINER (0 - 1.4MM)
 WET DENSITY AT 68°F: 148-155 LB./FT³ (2.4 - 2.5 G/CC)
 COEFFICIENT OF THERMAL EXPANSION: 5 x 10⁻⁶ in./in./°F (68°F TO 1832°F)
 4. CHEMICAL COMPOSITION
 SEMPERCOAT® IS A BLEND OF CALCIUM SULFATE, CALCIUM CHLORIDE, TRICALCIUM ALUMINATE, LIME HYDRATES OR AGGRESSIVE AGENTS THAT ATTACK REINFORCING STEEL. THE HIGH-PERFORMANCE PROPERTIES OF SEMPERCOAT® ARE ACHIEVED THROUGH A BLEND OF MINERAL ELEMENTS.
 CHEMICAL ANALYSIS MAIN COMPONENTS
 Al₂O₃ CaO Fe₂O₃ SO₂
 41% - 46% 33% - 38% 8% - 13% 4% - 9%

5. INSTALLATION
 CLEAN, POTABLE WATER SHOULD BE USED FOR MIXING. THE WATER REQUIREMENT IS PROVIDED ON EACH INDIVIDUAL BAG AND IS CRITICAL TO OBTAIN THE SPECIFIED PERFORMANCE PROPERTIES. ALWAYS STAY WITHIN THE RECOMMENDED SPECIFICATIONS FOR MIXING WATER.
 SEMPERCOAT® PRODUCTS ARE NOT DESIGNED TO BE HANDAPPLIED. SEMPERCOAT® IS DESIGNED TO BE APPLIED WITH LOW-PRESSURE, WET-SPRAY EQUIPMENT. PREPARATION OF THE SURFACE TO BE COATED SHOULD BE PERFORMED IN ACCORDANCE WITH APPLICABLE INDUSTRY STANDARDS AND SPECIFIC PROJECT SPECIFICATION REQUIREMENTS. SANDBLASTING AND/OR HYDRO-BLASTING WITH HIGH-PRESSURE WATER MAY BE USED TO REMOVE EXISTING DETRIMENTATION AND DEBRIS. THE IMMEDIATE BONDING OF SEMPERCOAT® TO THE SURFACE OF ANY EXISTING COATINGS, SEWER RESIDUE, AND RUNNING WATER, THE STRUCTURE ITSELF SHOULD BE FULLY SATURATED PRIOR TO A SEMPERCOAT® INSTALLATION. PLEASE SEE OUR SUGGESTED SEMPERCOAT® SPECIFICATION LANGUAGE FOR DETAILED SURFACE PREPARATION RECOMMENDATIONS.
 SEMPERCOAT® PRODUCTS ARE TO BE APPLIED TO SURFACES WITH NO CIRCUMSTANCES OTHER THAN WATER. BE ADDED TO SEMPERCOAT® PRODUCTS. SEMPERCOAT® SHOULD NOT BE USED AS A "BUILD-OUT" MIX OR UNDERLAYMENT FOR ANY OTHER PRODUCT. SEMPERCOAT® SHOULD NOT BE USED IN CONJUNCTION WITH OR ADJACENT TO ANY MORTAR OR GROUT COATINGS, INCLUDING BUT NOT LIMITED TO EPOXY, POLYURETHANE, POLYUREA, AND FIBERGLASS. CURING SHOULD BE IMPLEMENTED AS SOON AS THE SURFACE BEGINS TO HARDEN AND DRY (AS EARLY AS ONE HOUR AFTER APPLICATION). SEVERAL LAYERS OF ASTM C309 LIQUID MEMBRANE CURING COMPOUND OR A 100%-HUMID MOISTURE CURE MAY BE USED.
 EQUIPMENT USED MUST ALWAYS BE CLEAN AND FREE OF PORTLAND CEMENT BUILD-UP TO AVOID ACCELERATED SET.
 GENERALLY ACCEPTED CONCRETING PRACTICES (WATER RATIO PER BAG, COMPACTION, CURING, ETC.) SHOULD BE EMPLOYED TO OBTAIN THE BEST QUALITY INSTALLATION WITH RESPECT TO MECHANICAL STRENGTH AND CORROSION RESISTANCE.
 6. AVAILABILITY
 SEMPERCOAT® IS AVAILABLE IN NORTH AMERICA DIRECTLY THROUGH KERNEOS INC. MAIN OFFICE AND WAREHOUSES.
 SEMPERCOAT® IS PACKAGED IN VARIOUS BAG SIZES DEPENDING UPON APPLICATION AND INSTALLATION METHODS. SEMPERCOAT® IS TYPICALLY SUPPLIED PALLETIZED IN 65-LB BAGS.
 FOR MORE INFORMATION ABOUT SEMPERCOAT®, INCLUDING A LIST OF INSTALLERS, PLEASE CONTACT KERNEOS INC. AT 1-800-524-8463.
 7. TECHNICAL ASSISTANCE
 A LICENSED PROFESSIONAL ENGINEER IS RESPONSIBLE FOR THE DETERMINATION OF SUITABILITY, OVERALL DESIGN, SPECIFICATIONS AND FOLLOW UP FOR EACH PROJECT. KERNEOS INC. HAS A TECHNICAL ASSISTANCE DEPARTMENT WITH ON-SITE LABORATORY FACILITIES AVAILABLE TO PROVIDE CUSTOMER SUPPORT. KERNEOS ASSISTANCE IN TECHNICAL PLANNING AND INSTALLATION OF A PROJECT DOES NOT WARRANT THE SUCCESS OF ANY APPLICATION AND IS NOT A SUBSTITUTE FOR PROFESSIONAL ENGINEERING ADVICE.
 8. PACKAGING & SHELF LIFE
 SEMPERCOAT® IS AVAILABLE PALLETIZED IN 65-LB BAGS. SEMPERCOAT® PACKAGING IS DESIGNED TO PROTECT IT FROM HUMIDITY. HOWEVER, AS WITH ALL PREPACKAGED CONCRETES, SEMPERCOAT® SHOULD NOT BE PLACED IN DIRECT CONTACT WITH THE GROUND. WHEN CORRECTLY STORED IN DRY CONDITIONS, THE PROPERTIES OF SEMPERCOAT® SHOULD REMAIN WITHIN SPECIFICATION LIMIT FOR AT LEAST 6 MONTHS. IN MOST CASES, ITS PROPERTIES WILL BE MAINTAINED FOR OVER A YEAR.
 SEMPERCOAT® 10 YEAR LIMITED WARRANTY (OWNER)
 THIS WARRANTY EXTENDS TO THE OWNER OF THE STRUCTURE TO WHICH SEMPERCOAT® IS APPLIED, EFFECTIVE AS OF THE OWNER'S ACCEPTANCE OF THE WORK. KERNEOS WARRANTS TO THE OWNER THAT SEMPERCOAT®, WHEN INSTALLED IN COMPLIANCE WITH THE RECOMMENDED INSTALLATION GUIDELINES PUBLISHED BY KERNEOS, WILL PROTECT SANITARY WASTEWATER STRUCTURES FROM BIOLOGIC CORROSION CAUSED BY EXPOSURE TO SANITARY SEWAGE ENVIRONMENT TO BE HONORED. CLAIMS MUST BE FILED BY THE OWNER WITHIN 10 YEARS OF ACCEPTANCE OF THE WORK BY OWNER. KERNEOS OBLIGATIONS HEREUNDER EXTEND ONLY TO PROVIDING LABOR AND MATERIAL TO REPLACE THE DEFECTIVE MATERIAL.
 THIS WARRANTY EXCLUDES CONSEQUENTIAL AND INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGE TO EQUIPMENT AND PERIPHERAL FACILITIES, SERVICE INTERRUPTION, LOSS OF PROFITS, AND THE LIKE). THIS WARRANTY APPLIES TO SANITARY SEWAGE EXPOSURE ONLY. EXPOSURE TO EFFLUENT, CHEMICALS, OR CONTAMINANTS FROM INDUSTRIAL DISCHARGE WILL VOID THIS LIMITED WARRANTY.
 SEMPERCOAT® (LIMITED WARRANTY) (BUYER)
 KERNEOS WARRANTS TO THE BUYER OF THIS PRODUCT THAT, AT THE TIME OF SHIPMENT, THE PRODUCT CONFORMS TO THE SPECIFICATIONS SET FORTH IN SECTION 2 OF THE APPLICABLE PRODUCT DATA SHEET. TO BE HONORED, CLAIMS UNDER THIS WARRANTY MUST BE FILED BY THE BUYER WITHIN 30 DAYS OF USE OF THE PRODUCT OR 6 MONTHS OF DELIVERY TO ITS BUYER, WHICHEVER COMES FIRST. KERNEOS'S OBLIGATION AND THE SOLE AND EXCLUSIVE REMEDY OF BUYER UNDER THIS WARRANTY SHALL BE THE REPLACEMENT OF ANY NONCONFORMING PRODUCT, OR, AT KERNEOS OPTION, THE REFUND OF THE PURCHASE PRICE PAID BY ITS BUYER.
 THERE ARE NO WARRANTIES EXPRESS OR IMPLIED, TO OWNER OR BUYER EXCEPT AS PROVIDED IN THIS LIMITED WARRANTY. ALL OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXCLUDED. NO WARRANTY IS GIVEN FOR, OR MAY BE IMPLIED FROM, ANY TECHNICAL ADVICE, OR RECOMMENDATIONS PROVIDED BY KERNEOS.
 WARRANTY CLAIM PROCEDURE
 KERNEOS RESERVES THE RIGHT TO INSPECT AND DETERMINE WHETHER ANY CLAIM IS THE RESULT OF A BREACH OF A WARRANTY SET FORTH HEREIN OR IS RELATED TO ANOTHER CAUSE (ALL OTHER CAUSES ARE EXPRESSLY EXCLUDED FROM COVERAGE BY THE WARRANTIES CONTAINED HEREIN).
 ANY CLAIM UNDER THIS LIMITED WARRANTY REQUIRING AN INVESTIGATION BY KERNEOS MAY REQUIRE EXTENSIVE LABORATORY TESTING. IT IS THE RESPONSIBILITY OF ANY PARTY MAKING A CLAIM TO MAKE ANY PRODUCT OR STRUCTURE REQUIRING TESTING ACCESSIBLE AND AVAILABLE TO KERNEOS WITHIN A REASONABLE PERIOD OF TIME AFTER A CLAIM ARISES. INSPECTION, INCLUDING THICKNESS VERIFICATION AND THE GATHERING OF SPECIMENS FOR TESTING MAY REQUIRE THE REMOVAL OF A PORTION OF THE SEMPERCOAT® LINING. IF A QUESTION OR, IF A STRUCTURE REQUIRING INVESTIGATION CANNOT BE MADE READILY ACCESSIBLE, THE REMOVAL OF ANY FRAMES, COVERS, OR OBSTRUCTIONS, AT KERNEOS OPTION, TECHNICAL INVESTIGATIONS AND TESTING MAY BE PERFORMED BY EITHER KERNEOS INTERNAL FACILITIES OR BY AN INDEPENDENT AGENCY.
 IT IS THE RESPONSIBILITY OF THE CUSTOMER TO MAINTAIN AND DOCUMENT PRODUCT INSTALLATION AND JOB ACCEPTANCE REPORTS IN ACCORDANCE WITH ALL APPLICABLE INSTRUCTIONS INCLUDING, WITHOUT LIMITATION, THE LOCATION AND DATE, THE QUANTITIES INSTALLED, THE MIXING METHODS, SURFACE PREPARATION PROCEDURES USED, INSTALLATION PERSONNEL, AND EXISTING CONDITIONS OF THE STRUCTURE, INCLUDING H₂S CONCENTRATIONS AND INITIAL SURFACE PH. KERNEOS WILL PROVIDE INSTALLATION REPORT FORMS UPON REQUEST.

1. GENERAL CHARACTERISTICS
 COMPRISED ENTIRELY OF CALCIUM ALUMINATES, SEMPERCOAT® IS A PRE-PACKAGED READY TO USE, FIBER REINFORCED, HIGH STRENGTH WET SHOTCRETE MATERIAL. SEMPERCOAT® IS A MORTAR THAT IS DESIGNED TO COAT BOTH NEW AND EXISTING MUNICIPAL WASTEWATER STRUCTURES INCLUDING MANHOLES, LIFT STATIONS, WET WELLS, ETC. IT IS DESIGNED SPECIALLY TO PROVIDE AN ABRASION AND CORROSION-RESISTANT, PROTECTIVE LINING THAT CAN WITHSTAND SEVERE BIOLOGIC CORROSION CAUSED BY THE HYDROGEN SULFIDE (H₂S) FOUND IN WASTEWATER ENVIRONMENTS.
 THE UNIQUE PROPERTIES OF SEMPERCOAT® RESULT FROM THE CHEMICAL AND MINERAL PHASES FORMED DURING THE HYDRATION PROCESS. SEMPERCOAT® IS UNIQUE WHEN COMPARED TO OTHER MATERIALS SUCH AS PORTLAND CEMENT (OPC) CONCRETE, EPOXIES, POLY-VINYL CHLORIDE (PVC) OR POLYETHYLENE, BECAUSE OF ITS CAPACITY TO INHIBIT BACTERIAL ACTIVITY BY EFFECTIVELY NEUTRALIZING SULFURIC ACID PRODUCTION.
 SEMPERCOAT® IS AN ADHESIVE MORTAR THAT POSSESSES THIN SECTION THICKNESS AS WELL AS HIGH COMPRESSIVE AND FLEXURAL STRENGTHS. ADDITIONAL FEATURES INCLUDE HIGH EARLY STRENGTH, FREEZE-THAW RESISTANCE AS WELL AS HIGH TEMPERATURE RESISTANCE (UP TO 1000°F). SEMPERCOAT® IS ALSO RESISTANT TO MANY OTHER TYPES OF CORROSION INCLUDING SULFATES, SEAWATER, OILS, GASES, AND DILUTE ACIDS (PH RANGE 3.5 - 11).
 SEMPERCOAT® DOES NOT RELEASE CALCIUM HYDROXIDE AS A HYDRATION PRODUCT. THIS IMPARTS GOOD CHEMICAL RESISTANCE AND ELIMINATES THE MAJOR CAUSE OF EFFLORESCENCE.
 SEMPERCOAT® IS A VERY DARK GRAY COLOR.
 SEMPERCOAT® DOES NOT CONTAIN CRYSTALLINE SILICA.
 *MATERIAL PROPERTIES (DETERMINED BY AN INDEPENDENT TESTING LABORATORY):
 ASTM C 109 COMPRESSIVE STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 293 FLEXURAL STRENGTH PSI 24 HRS 28 DAYS
 ASTM C 596 SHRINKAGE AT 90% HUMIDITY, % 24 HRS 28 DAYS
 ASTM C 286 FREEZE-THAW AFTER 300 CYCLES NO DAMAGE
 ASTM C 496 SPLITTING TENSILE STRENGTH PSI 28 DAYS
 ASTM C 286 BOND STRENGTH GREEN MONSTER™ SHALL ONLY BE APPLIED WITH A MINIMUM OUTPUT PRESSURE OF 2,500 PSIG > 2,300 PSI @ 28 DAYS
 ASTM C 457 AIR VOID CONTENT (7 DAYS) 2-

