| Section N: Concrete | Effective Date: 01-01-20<br>Revision #: 2 |
|---|---|

N 1 Concrete/ Type S Mortar

N 2 Cement/ Calcium Aluminate

N 3 Cement/ Calcium Aluminate Lining System/ Sanitary Sewer

N 4 Concrete/ High Early Concrete Mix

N 5 Non-Shrink Grout

**N 1 – CONCRETE/ TYPE S MORTAR:**

Effective Date: 01-01-20
Revision #: 2

**SPECIFICATION:**

Type S Mortar shall meet or exceed the performance specification of:

- ASTM C1329, ASTM C270
- All walls shall be cleaned and free from orange material and harmful amount of dissolved acids, alkalies, and salts.
- Resistance to freeze – thaw deterioration.

**TECHNICAL DATA:**

- Compressive Strengthen
- 7 Days – 1300 psi
- 28 Days – 2100 psi

**MANUFACTURER:**

- QUIKRETE
- CEMEX
- OPEN

**RESTRICTIONS:**

## N 2 – CEMENT/ CALCIUM ALUMINATE:

Effective Date: 01-01-20
Revision #: 2

**SPECIFICATION:**

Calcium aluminate cement shall meet or exceed the performance specifications of:

- Made with 100% fused calcium aluminate aggregate and calcium aluminate cement.

Compressive strength per ASTM C109 shall meet the following minimums:

- 1 hour – 400psi
- 24 hours – 2000psi
- 28 days – 9000 psi
- Shall have a minimum bond of 2000psi per ASTM C882.
- Shall have no shrinkage @ 95% R.H. per ASTM C596.

**APPLICATION:**

- For use where harsh hydrogen sulfide conditions exist in sanitary sewers.
- For construction or reconstruction of the bench and invert in concrete, masonry, or inert (such as fiberglass) lined manholes, wet wells and lift stations.


**MANUFACTURER:**

- STRONG SEAL– BENCH MIX
- OPEN

**RESTRICTIONS:**

- Only permitted for the rehabilitation or reconstruction of manhole benches.

**N 3 – CEMENT/ CALCIUM ALUMINATE LINING SYSTEM/ SANITARY SEWER:**

Effective Date: 01-01-20
Revision #: 2

## SPECIFICATION:

Calcium aluminate cement lining system shall meet or exceed the performance specifications of:

- Lining material shall provide a corrosion resistant liner to prevent any deterioration of concrete surfaces from hydrogen sulfide and other corrosive gases/acids produced by wastewater and to prevent infiltration.
- Shall be 100% calcium aluminate cement with 100% calcium aluminate aggregate.
- Manufacture shall warrant material and workmanship for a minimum period of ten (10) years.
- Shall be designed to withstand long-term exposure to a bacterially corrosive hydrogen sulfide environment that may be expected to produce a pH of 1 on normal Portland Cement concrete or typical brick and mortar surfaces.
- Mortar furnished under this specification shall be a pre-packaged mortar, including all cement, aggregate, and any required admixtures of fibers.
- It is the intent of this specification that the contractor only be required to add the proper amount of potable water so as to produce a mortar suitable for pneumatic application.
- Typical package weights shall not be less than 50 pounds.
- To ensure total unit responsibility, all materials and installation shall be furnished by, and coordinated with, one supplier/ manufacture.
- The chemical composition of the cement portion as well as the aggregates of the mortar mix shall be as follows:

| Chemical analysis main constituents | | | |
|---|---|---|---|
| $Al_2O_3$ | CaO | $FeO+Fe_2O_3$ | $SiO_2$ |
| 39% - 44% | 34% - 38% | 9% - 15% | 6% - 8% |

## RESTRICTIONS:

- Use of this product is restricted to coating rehabilitation of existing manhole structures.

The design properties of the mortar mix shall be as follows:

| TYPICAL MATERIAL PROPERTIES* (*PERFORMED BY AN INDEPENDENT TESTING LABORATORY @ 14-16% water*) | | | | |
|---|---|---|---|---|
| | SEWPERCOAT® PG | 24 HRS | 7 DAYS | 28 DAYS |
| ASTM C 109 | Compressive Strength, psi | >5,500 | >6,000 | >7,000 |
| ASTM C 348 | Flexural Strength, psi | >900 | >1,100 | >1,300 |
| ASTM C 157 | Shrinkage after 28d immersion, % | < 0.04 | < 0.05 | < 0.07 |
| ASTM C 496 | Splitting Tensile Strength, psi | >550 | >600 | >700 |
| ASTM C 882 | Bond Strength by Slant Shear, psi | | >2500 | >2500 |
| ASTM C 666 | Freeze-Thaw – 300 cyc, Rel. Dyn. Modulus | 102 | | |
| ASTM C 642 | Volume of Permeable Voids (40 days), % | 15 | | |
| ASTM C 642 | Apparent Density (40 days) | 2.74 | | |
| ASTM C 469 | Modulus of Elasticity (28 days), ksi | >5,000 | | |

*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 different than those listed above. The warranted material properties are presented in section two of this Product Data Sheet.


## MANUFACTURER:

- KERNEOS ALUMINATE TECHNOLOGIES
- SEWPERCOAT “PG”
- OPEN

Cape Fear Public Utility Authority
Stewardship. Sustainability. Service.

**N 4 – CONCRETE/ HIGH EARLY CONCRETE MIX:**

Effective Date: 01-01-20
Revision #: 2

**SPECIFICATION:**

High early concrete mix shall meet or exceed the performance specifications of:

- Shall be used above or below grade, interior or exterior.
- High early concrete mix furnished under this specification shall be a pre-packaged product, including all cement and any required admixtures.
- It is the intent of this specification that the contractor only be required to add the proper amount of clean potable water so as to produce a concrete mix suitable for application.
- Coverage: A 60-lb. bag yields approximately 0.45 cu ft.
- An 80-lb. bag yields approximately 0.6 cu ft.
- Packaging: 60-lb. & 80-lb. bags.
- Shelf life: One year from date of manufacture.

**TECHNICAL DATA:**

- Shall have a minimum compressive strength, ASTM C-387, 1 day- 1500psi, 3 day- 2500psi, 7 day- 3500, 28 day- 5000.
- Slump range- 2”-3”.

**MANUFACTURER:**

- QUIKRETE- QUIKRETE 5000 HIGH EARLY STRENGTH CONCRETE MIX #1007
- A.W. COOK CEMENT
- OPEN

**RESTRICTIONS:**

Use of this product is restricted to small nonstructural concrete repairs where truck mix is not practical and should be limited to:

- Sidewalk panel replacement.
- Curb and gutter section replacement.
- Valve box pads.

**N 5 – NON-SHRINK GROUT:**

Effective Date: 01-01-20
Revision #: 2

**SPECIFICATION:**

Non-shrink grout shall meet or exceed the performance specifications of:

- ASTM C928 R
- ASTM C1107
- Non-shrink, high strength, high flow material
- Shall be used above or below grade, interior or exterior.
- It is the intent of this specification that the contractor only be required to add the proper amount of clean potable water so as to produce a mix suitable for application.
- When hardened, does not shrink so it's final volume is greater than or equal to the original installed volume.
- Can be utilized in a fluid, flowable or plastic consistency. Respective compressive strengths will vary based on consistency.
- In accordance with ASTM C1107, grout shall be maintained at 70 degrees F to achieve specified performance.

**Technical Data**

| Consistency | Plastic | Flowable |
|---|---|---|
| 24 Hours | 5,000 psi | 4,500 psi |
| 7 Days | 6,000 psi | 5,500 psi |
| 28 Days | 8,000 psi | 7,500 psi |


**MANUFACTURER:**

- QUIKRETE
- SIKAGROUT
- OPEN

**RESTRICTIONS:**

This product can be used for load transfers, structural repairs and reinforcing steel, to include:

- Anchor Bolts
- Reinforcing Steel
- Manhole Repairs
- Load Transfers
- Bearing Plates