

# NSB TECHNICAL SPECIFICATION

## NATIVE SLURRY BACKFILL (NSB)

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Furnish & Install Native Slurry Backfill (NSB) with an average 28 day compressive strength between 75 - 200 psi using Native Soil as the aggregate.

#### 1.02 REFERENCE STANDARDS

##### A. ASTM International

1. ASTM C 114-10a                      Chemical Analysis of Hydraulic Cement
2. ASTM C 150                              Portland Cement
3. ASTM C595/595M-10                  Blended Hydraulic Cements
4. ASTM C 1602/C 1602M-06          Mixing Water used in the Production of Hydraulic  
Cement Concrete
5. ASTM D 422                              Particle-Size Analysis of Soils
6. ASTM D 4318                            Liquid Limit, Plastic Limit and Plasticity Index of Soils
7. ASTM D 4832-10                      Preparation and Testing of Controlled Low Strength  
Material (CLSM) Test Cylinder
8. ASTM D 5791                            Sampling Freshly Mixed Controlled Low-Strength  
Material
9. ASTM D 6103-04                      Flow Consistency of Native Slurry Backfill

#### 1.03 QUALITY ASSURANCE

- A. Manufacturer: Native NSB shall be manufactured by a producer with a minimum of 5 years experience in the production of Native NSB.

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### 1.04 SAMPLING AND TESTING DURING CONSTRUCTION

During Native Soil Backfill (NSB) Placement the Owners Representative shall designate the responsible party to take samples, in accordance with ASTM D5971, and perform tests to determine compliance with product requirements.

#### A. Testing

1. Recommend an Independent testing laboratory who shall perform testing and reporting.
  - a. Independent testing laboratory shall be an AASHTO Certified Lab
2. Obtain samples and test to determine compressive strength in accordance with ASTM D4832 and spread in accordance with ASTM D6103
  - a. Testing Frequency:
    1. At least one set for each shift when placing Native NSB (3,7, 28 day & 1 holds)
    2. One set for every 400 yd<sup>3</sup>
  - b. Acceptance Criteria:
    1. Average 28 day compressive strength between 75 – 200 psi

### 1.05 SUBMITTALS

Submit the following in accordance with Submittal Section of Specifications

#### A. Approval Data

1. Mix design with test results showing conformance with specified requirements for compressive strength and spread.
2. Soil processing and mixing equipment being used on site
3. Provide a submittal showing the proposed methods to support and protect new and existing structures and/or pipe during NSB placement.

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### PART 2 – PRODUCTS

#### 2.01 CEMENTITIOUS MATERIALS

##### A. Portland Cement:

- a. ASTM C 150, Type II/V
- b. Meet equivalent alkalis requirements of ASTM C 150 – Table 2

#### 2.02 WATER

- ##### A. Water shall conform to the requirements of ASTM C 1602

#### 2.03 NATIVE SOIL

- ##### A. Native soil shall not contain visible organic material, gravel larger than 2 inches, debris or any other deleterious material.
- ##### B. Native soil must be processed such that the largest clump of soil in the NSB mixture shall be no larger than 2 inches and 90% of the clumps of soil in the mixture are not larger than 1 ¼ inches.

#### 2.04 MIX

##### A. Mixture of Native Soil, Cementitious Materials, and Water

1. Typical cement content: 3 percent to 12 percent by dry weight of Native Soil to obtain specified compressive strength
2. Make 3 to 4 trial mixes, per soil source, prior to placing NSB to determine mixture adequacy
  - a. Determine compressive strength in accordance with ASTM D 4832
  - b. Determine spread in accordance with ASTM D 6103

##### B. Use one of the specified cementitious material options to obtain specified compressive strength

1. Average 28 day compressive strength between 75-200 psi

##### C. Water Content: Not to exceed that required to provide mix that will flow and can be pumped

##### D. Consistency:

1. Spread – In accordance with ASTM D6103
2. Except when a stiffer mix required

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### PART 3 – EXECUTION

#### 3.01 BATCHING, MIXING, DELIVERY, STORAGE AND HANDLING

- A. Batching, mixing, delivery, storage and handling of NSB shall be in accordance with the recommendation of ACI 229R, unless otherwise indicated in this specification or approved by the Owner Representative.
- B. Native NSB shall be produced onsite with approved portable batching equipment ([www.griffinsoil.com](http://www.griffinsoil.com) or equal) operated by a qualified producer.
- C. Equipment calibration, to adjust cement dosage rate, must be performed prior to starting work, and whenever requested by Owners Representative to evaluate suspected or known non-conformance, or at least monthly.

#### 3.02 INSTALLATION

- A. Use sufficient shores or other supports to prevent soil from caving.
- B. Remove all loose soil, rubbish, organic material, and other deleterious material from excavation prior to placing NSB.
- C. NSB shall not be placed when the air temperature is below 40 degrees F
- D. No equipment or traffic shall be allowed on the NSB until the surface of the NSB can withstand the weight of the equipment or traffic without displacement or damage. Suitability for load applications shall be determined by ASTM D 6024 or approved by the Owner Representative.