

## SECTION 13229 - GRAVEL FILTER BED

### City of San Diego, CWP Guidelines

#### PART 1 - GENERAL

##### 1.1 WORK OF THIS SECTION

- A. The WORK of this Section includes providing the gravel bed over the Plastic Block Air Scouring Filter Underdrains and performing all indicated washing and testing.

##### 1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 13221 Plastic Block Air Scouring Filter Underdrains
2. Section 13226 Anthracite Media

##### 1.3 SPECIFICATIONS AND STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the WORK of this Section:

1. ANSI/AWWA B100 Filtering Material
2. ASTM E 11 Specification for Wire-Cloth Sieves for Testing Purposes

##### 1.4 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01300:

1. Samples of several sizes of gravel proposed to be used. No gravel shall be shipped prior to approval by the CONSTRUCTION MANAGER of the submitted samples.

The minimum sample quantities to be collected, and minimum sample quantities for testing shall be as noted below:

<u>Gravel Size</u>	<u>Minimum Sample to be Collected</u>	<u>Minimum Sample Used in Testing</u>		
		<u>Sieve Test</u>	<u>Spec Grav</u>	<u>Acid Sol</u>
1-1/2 to 3/4-in	32 kg (70 lb)	16 kg	5 kg	250 g
3/4 to 1/2-in	14 kg (30 lb)	7 kg	3 kg	250 g
1/2 to 1/4-in	9 kg (20 lb)	4.5 kg	2 kg	250 g
1/4 to 1/8-in	4.5 kg (10 lb)	2.3 kg	2 kg	100 g
1/8 and smaller	4.5 kg (10 lb)	500 g	2 kg	100 g

- B. **CONSTRUCTION MANAGER'S Approval:** The CONSTRUCTION MANAGER approval of the submitted gravel samples shall not be construed as signifying that the materials satisfy all requirements of these Specifications and shall not relieve the CONTRACTOR of the obligation to satisfy all requirements indicated herein.

## PART 2 - PRODUCTS

### 2.1 GENERAL

- A. Gravel filter bed material and testing methods shall conform to the requirements of ANSI/AWWA B100 except as otherwise indicated.
- B. The filter gravel provided shall be equal in all respects to the approved samples, and similar samples for test purposes shall be furnished as required by the CONSTRUCTION MANAGER during the preparation and placing of the filter materials.

### 2.2 GRAVEL FILTER BED

- A. **General:** Gravel filter bed shall consist of a 12-inch deep layer of graded sizes of filter gravel placed above the plastic block air scouring filter underdrain system as indicated.
- B. **Material Quality:** Filter gravel shall consist of hard, durable, rounded particles containing not more than 3 percent of thin, flat, or elongated pieces where the longest axis of a circumscribing rectangular prism exceeds 5 times the shortest axis.
- C. The gravel shall be washed and screened, and shall be visually free of shale, mica, clay, silt, sand, shells, dirt, and organic impurities or other foreign matter.
- D. The average specific gravity of the stones shall be not less than 2.5, and the acid solubility, when tested in accordance with Section 5 of ANSI/AWWA B100 shall not exceed 5 percent for sizes smaller than No. 8, 17.5 percent for sizes larger than No. 8 but smaller than 1-inch, and 25 percent for sizes 1-inch and larger.
- E. **Gradation Standard:** Filter gravel shall be screened through square opening sieves conforming to ASTM E 11 and not more than 8 percent of the weight of any size of filter gravel shall be finer or coarser than the indicated size limits.

## PART 3 - EXECUTION

### 3.1 GRAVEL FILTER

- A. **Preparation of Filters:** Before beginning the placing of any gravel, the CONTRACTOR shall thoroughly clean and sweep the walls and top of the plastic underdrain blocks, making sure to leave no soil or debris. All openings in the filter underdrain system should be checked to ensure that all holes and water passages are properly aligned and are open and free of obstruction. Any foreign matter found therein shall be removed. The filter underdrain system shall then be hydraulically tested for any visible leakage through joints, and for proper backwash water distribution, prior to the placement of the filter gravel.
- B. **Installation:**
  - 1. Special care shall be taken in transporting and placing the gravel to prevent it from becoming contaminated with dirt. Any gravel which becomes dirty, either before or after it has been placed in the filters, shall be either removed and washed, or replaced with clean gravel. All gravel which has been contaminated by organic matter will be rejected.

2. The gravel shall be deposited in such a manner as to avoid damaging the underdrains. While placing the first layer of gravel, provision shall be made to protect the adjacent underdrains with adequately supported planking at all locations where gravel is lowered into the filter unit.
3. Each layer shall be brought up to the required elevation and made level over the entire filter bed area, and shall be smoothed down to a true surface. The placement of gravel in each layer shall be inspected by the CONSTRUCTION MANAGER before the next layer is placed. The placing of each size of gravel shall be completed in any one filter unit before beginning the placing of the next layer.
4. Care shall be taken not to injure equipment and piping in the filter units by walking on or dropping gravel upon them.

\*\* END OF SECTION \*\*