

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51

(August 3, 2015)
Exposed Aggregate Finish
Submittals

The Contractor shall submit Type 2 Working Drawings consisting of the following items:

1. Written description of the equipment to be used and procedure to be followed in producing the exposed aggregate finish.
2. Two copies each of the manufacturer's written instructions for applying the retardant coating and the clear sealer.
3. Type of nozzle, nozzle pressure, type and gradation of abrasive, blasting techniques, safety procedures, and containment methods and procedures used with all abrasive blasting and water blasting operations.
4. The method and materials used to collect, contain, and dispose of the concrete surface mortar removed from the finish surface, and the chemical agent residue and abrasives used to remove the concrete surface mortar.
5. A sample panel, equal to the size of one traffic barrier panel minimum, cast in a vertical position on the site and constructed in accordance with the procedure outlined in the Type 2 Working Drawing submittal.

Producing Exposed Aggregate Finish

The Contractor shall produce all exposed aggregate concrete in accordance with procedure and equipment outlined in the Type 2 Working Drawing submittal. The exposed aggregate shall achieve the same final effect as demonstrated on the sample panel accepted by the Engineer.

Formwork shall be cleaned, reconditioned, and repaired before each use. Formwork with repairs, patches or defects which, in the opinion of the Engineer, would result in adverse effects to the concrete finish shall not be used.

Forms and form joints shall remain completely watertight. Butt joints and joints between form units used on surfaces which are to receive an exposed aggregate finish shall be tongue and grooved, or splined and shall be sealed with a caulking compound.

As an alternative to using tongue and grooved or splined joints, a closed cell polyvinylchloride foam sealer of 3/16 inch thickness with pressure-sensitive adhesive on one or both sides may be used to seal the butt joints between form units. The foam sealer shall be recessed by an amount such that when the form units are compressed to their final position, the foam sealer will be flush with the face of the form units. Adjacent formwork panels, if used, shall be in line and no offset shall occur between panels.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52

Forms for the exposed aggregate surface for members not yet supporting loads, including the members own load, may be removed as required to effect the exposed aggregate surface, provided the concrete has a minimum age of twelve hours and is of sufficient strength and hardness so as not to be damaged by the form removal operations and provided that curing and protection operations are maintained.

Removal of forms on the remaining concrete surfaces shall be in accordance with Section 6-02.3(17)N.

After the forms are stripped, the surface mortar shall be removed from the areas specified to receive the exposed aggregate finish.

The exposed aggregate finish shall be obtained by either one or a combination of the two following methods as necessary to provide the specified exposed aggregate finish:

Method 1 - Retardant Coating

A retardant coating as specified for Method 1 in Section 6-02.2 as supplemented in these Special Provisions shall be applied to the formwork where concrete surfaces with exposed aggregate finish are shown in the Plans.

For cast-in-place concrete the retardant shall have an effective life of not less than the length of time required for the Class EA concrete to be in place prior to the removal of forms plus 12 hours.

For slip-formed traffic barrier the retardant shall have an effective life of not less than 24 hours. The Contractor shall remove the surface mortar two to three hours after applying the retardant coating.

Retardant shall be applied in accordance with the manufacturer's instructions to remove the surface mortar.

The sealer and form release agent used on the form shall be compatible with the retardant and shall not react with the retardant to produce an undesirable effect on the exposed aggregate finish. The sealer and form release agent to be used on the form shall be as recommended by the manufacturer of the retardant.

Surface mortar shall be removed using one of the following methods:

1. Light abrasive blasting
2. Washing with water under pressure, avoiding excessive pressure which loosens individual aggregate particles.
3. A combination of both methods.

Method 2 - Abrasive Blasting

As soon as forms are stripped, the exposed aggregate areas shall be abrasive blasted to remove the surface mortar. For slip-formed traffic

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

barrier this shall be done once the concrete has attained a minimum age of 12 hours and is of sufficient strength and hardness to prevent damage.

Adjacent materials and finishes shall be protected from dust, dirt and other damage during abrasive blasting operations. Corners and edge of patterns shall be carefully blasted using back-up boards to maintain a uniform corner or edge line.

The abrasive blast finishing shall be done in as continuous an operation as possible, utilizing the same work crew to maintain continuity of finish on each surface or area of work.

The type and gradation of abrasive grit used, the type of nozzle, nozzle pressure, and blasting techniques shall be as specified in the Type 2 Working Drawing submittal, and as required to expose the aggregate.

The Contractor shall be responsible for safety of the workers and shall equip each with air-fed helmets. The Contractor shall provide suitable enclosures for the collection of grit and dust from the abrasive blasting operation.

After receiving the Engineer's acceptance of the exposed aggregate finish, a 10 percent muriatic acid wash shall be applied to the exposed aggregate surfaces. Surfaces shall be flushed thoroughly with water following a 5 to 10 minute interaction period between the acid solution and the surface.

All stains and streaks on the exposed aggregate surface shall be removed before applying the clear sealer.