

**RECOMMENDED MORTAR
REPLICATION MIX**

**RETAINING WALL CAP
FT. WADSWORTH/GNRA
STATEN ISLAND, NEW YORK**

Prepared for:

**Peter Bathurst
National Park Service
Gateway National Recreation Area
26 Miller Field
Staten Island, NY 10306**

Prepared by:

**Jablonski Berkowitz Conservation, Inc.
580 Broadway, Suite 1207
New York, NY 10012**

9/9/96

REPLICATION RECOMMENDATIONS

The recommendations below represent an effort to approximate the properties of the client supplied historic mortar sample using modern materials. Consideration was given to matching color, texture and strength of the sample. The recommended mortar mix conforms to ASTM/BIA Standards. The replication mortar was matched to freshly broken surfaces of the weathered sample.

It is our recommendation that the mortar mix for the retaining wall be:

A Brick Institute (Standard 8A 9/88) TYPE N

Described as a medium strength mortar suitable for pointing use in exposed loadbearing masonry above grade and specifically recommended for parapets, chimneys and exterior walls subjected to severe weathering conditions.

Mortar Mix:

1/2 part White Portland Cement (ASTM C150), Type I (see materials)
1/2 part Lt. Grey Portland Cement (ASTM C150), Type I (see materials)

1 part Hydrated Lime, Type S (ASTM C207) (see materials)

6 parts aggregate mix (ASTM C144) composed of:

1/4 part - # 1, New Jersey Pulverizing (see materials)
1/4 part - # 2, New Jersey Pulverizing (see materials)
5 parts - Tan Mason's Sand (see materials)
1/2 part N.J.Pulv. 1/8" - 1/4", A-Gravel (see materials) *

1/8 of 1 part pigment composed of:

1/16 Yellow Ocher (see materials)
1/16 Burnt Umber (see materials)

A small quantity of the aggregate can be brush applied to the wall's top and pressed into the sample to simulate the effect of the historic mortar, which is one of weathered binder revealing concentrated aggregate its outer surface. The appearance can be duplicated in the field by brush or trowel applying a small quantity of aggregate to the mortar after it has been placed, but prior to initial set.

* Add the NJP 1/8" - 1/4" A-Gravel to mortar that will be placed in areas with such large aggregate.

NOTES: All parts should be measured by volume (not weight). Dry ingredients should be well blended before the addition of water.

Enclosed samples are made from the above recommended mix. Note that the enclosed sample has been etched to simulate the effect that natural weathering (erosion of binder, exposure of aggregate) over the next few years will have on the appearance of the mortar.

RECOMMENDED MATERIALS AND SUPPLIERS

As accurate replication mortar mixes are difficult to formulate, the type and quantity of materials used are essential to ensure on-site reproduction. Materials recommended in this report or their equal may be used. If materials are substituted, resulting appearance of mortar may vary.

Recommended Sands: As the selection of an appropriate aggregate is critical to the formulation of any replication mortar, the sand fraction isolated during analysis was compared to a library of sands commercially available in the greater New York area.

Above mentioned sands:

#107 - described as a pale tan mason's sand with variable sized grains. Visible quantities of white, milky and clear quartz.

Available from George Schofield Co.Inc., P.O. Box 110, Bound Brook, NJ 08805, (201)356-0858. Ask for Roy or substitute equal.

1/8 - 1/4 A-Gravel - described as gravel ranging in size from 1/4" to 1/2" and ranging in color from pale tan, white and grey.

#1 - described as angular aggregate (1mm) of clear, tan and white quartz.

#2 - described as angular aggregate (2mm) made of clear, tan and white quartz.

From New Jersey Pulverizing Co., 1140 Close Avenue, Bronx, NY, (718) 378-0200.

Recommended Pigments: Yellow Ocher and Burnt Umber are available as Rainbow Dry Colors from Empire Blended Products, Bayville, NJ 08721, (908) 269-4949.

Recommended Lime: Warner Superlimoid Hydrated Lime, Type S, available from Warner, call for local supplier (215) 295-7193 or **substitute equal**.

Recommended Cements: White, Norval, Type I, available from Norval, Inc., Brooklyn, NY or **substitute equal**, Light Grey Portland, Type I, from Allentown Cement through Norval, (718) 522-0800.

J A B L O N S K I B E R K O W I T Z C O N S E R V A T I O N I N C
A R C H I T E C T U R A L C O N S E R V A T O R S

September 10, 1996

Peter Bathurst
National Park Service
Gateway National Recreation Area
26 Miller Field
Staten Island, NY 10306

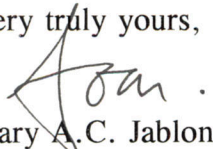
Dear Pete:

Greetings. I hope that this letter finds you well. Enclosed you will find the results of the mortar analysis and the recommended replication mix.

The sand mix recommended may seem complex, but I am not aware of any one sand available in the area that contains the correct size and color range of particles to match the original. If your mason can find a sand that approximates the original (see enclosed sample) - feel very free to substitute it for the New Jersey Pulverizing mix.

If you have any questions or difficulty with the mix don't hesitate to call.

Very truly yours,


Mary A.C. Jablonski

enc. 2 reports and samples