April 13, 2018

Hon. Meenakshi Srinivasan, Chair
New York City Landmarks Preservation Commission
One Centre Street, 9th Floor
New York, NY 10007

RE: Rule Amendments as it relates to the use of alternative materials

Dear Chari Srinivasan and Landmark Preservation Commissioners,

As a practicing member of the preservation community, I climb all over our city landmark buildings inspecting, cataloging, and surveying terra cotta. This has given me and my team an up-close view the effects alternative materials have on our landmark structures. This testimony provides photo illustrations of how these materials further destroy our landmarked protected neighborhoods and structures.

As you consider the testimony below, please know it does not come from a single source. The National Parks Preservation Brief No.7, multiple Columbia and UPENN theses, Historic Districts Council, and many reputable practicing preservationists all agree that the preferred method of properly restoring a building is to replace in kind. This means, if terra cotta was the original material, terra cotta should be used in a buildings restoration.

The new amended Landmark rules should not allow a staff level employee to approve anything BUT replacement in kind. Additionally, the LPC’s current practice of allowing alternative materials to be used on an application that is entered “with no effect” should no longer be approved.

**Terra Cotta vs. Cast Stone, GFRC, FRP, or Resin Based materials (Micro-Cotta)**

One of the largest problems with any of our historic structures is the infiltration of moisture that ultimately leads to the corrosion of the steel superstructure and attachment hardware. The steel will rust jack and bloat thereby causing stress on the terra cotta and ultimately result in terra cotta cracks. Therefore, a good maintenance program is required by owners to mitigate water from entering the structure. If not, the steel will continue to consume itself and cause further degradation.

**Compression vs. Tension**

Most of our terra cotta buildings are made of steel, brick, and terra cotta. Brick and Terra Cotta are both made from clay and kiln fired at roughly 2,000 degrees. When the material exits the kiln it is bone dry. The material expands and presses the mortar joints into compression effectively sealing up the joints. It is a time proven system that has lasted 100+ years.

Cementitious materials are manufactured differently. This is a cementitious aggregate, poured or dry tamped into molds. Water and pigments for color are added and the material is left to cure. There is no kiln. The dryers, depending on the product, are roughly 150 degrees. When the materials are in use, they absorb moisture and then shrink. This pulls the mortar joints into tension. In order to control the pulling and eventual cracking, a control joint is placed to accommodate this tension. At the control joint,
a sealant will be used. If not installed perfectly, the sealant will lift and separate from the material, thereby allowing moisture behind the ornament.

The cementitious materials will all creep, GFRC (Glass Fiber Reinforced Concrete) has the worst reputation. If sealant joints are not maintained regularly, then moisture has an easy entry point that will corrode steel and cause further damage.

**Historic Detail**

When terra cotta manufacturers replace in kind, they have the talent to reproduce the original terra cotta in its exact likeness. The method for manufacturing employs classically trained sculptures and hand finishing to recreate everything from simple ashlars, lintels, water tables, to very ornate panels, cornices, finials, and sculptures; with or without texture.
GFRC has a negative mold that is typically cast from the original. The casting does not always pick up every detail. The cementitious glass fiber is spray applied into the mold. A roller is used for compaction and left to cure overnight. There is no hand finishing.

Cast Stone has a mold sometimes cast from the original piece and also loses the original terra cotta’s detail. In the above photos the cementitious mix is dry tamped into the mold. There are no artisans. Unique hand finishes can be lost. Compare this to making a copy of a copy. As you continue to make the next copy, the level of detail reduces.

Recent instances on Madison Ave. and John Jay, Haaran Hall are examples where alternative replacement materials were used and now during the terra cotta replacement campaign, we are replacing the cast stone (400 Madison) and GFRC (John Jay) and the ornament has been lost. The previous alternative materials did not capture the texture or level of detail of the original material. Now during the terra cotta replacement, the ornament is gone.

**Aesthetics**
The aesthetic differences between these materials is also apparent. Terra Cotta is stable due to its glazing and firing process. GFRC, FRP, and Resin Based materials fade drastically under Ultra Violet exposure. A quick glance at dusk will illuminate these products and make them stick out like a sore thumb. The time frame for color failure can be as quick as 1 to 3 years.

Cast Stone has a pigment that is added but the aggregate can quickly reveal itself. It very easy to spot cast stone replacement following a rain while walking down the street and simply looking up.

As you consider the aesthetic changes that occur with alternative materials, I invite you to read this testimony following a rainy day while looking out from the LPC’s meeting room to the Woolworth
Building where a hodgepodge of terra cotta, cast stone, GFRC have all been used over the years for one repair campaign or another. Cass Gilbert did not intend for the building to look like a spotted leopard.

There are hundreds of buildings we could use to illustrate the problems above. Below are some recent projects that we have had the privilege of working on and examining up close how these materials have exacerbated further terra cotta failure.

**Battery Place**

The repair campaign called for GFRC above the window lintels. Terra Cotta is to the right and left. Not only does the GFRC window lintel glow and can be spotted from the ground, but its scale is also incorrect. The developer and design team are using the LPC loop holes to cut around the proper care of this building as terra cotta and GFRC are continually mixed and inappropriately used.
From 10th Avenue, you can easily spot the GFRC. It is bleached and looks plastic. When this repair campaign was done, the GFRC manufacturer and the architect did not replace in kind with material OR ornament. The original design included highly sculptural finials at the top, a characteristic of the Flemish Renaissance Revival architecture used by CB Snyder as illustrated by other CB Snyder projects, Intermediate School 319 in the Bronx or Public School 157 in Brooklyn.

Upon closer inspection, we see that the sealant joint is wide open on the sky facing joint. This just invites moisture to come in and wreak havoc on the rest of the structure below.
The brick below is completely cracked. The GFRC is efflorescing down the face causing salt damage to the rest of the structure and contributing to the corrosion.

Directly below the gables, almost the entire 6th floor lintels have completely corroded and rust jacked causing the terra cotta to crack under the pressure of the corroded steel.
All cementitious type materials have what is known as “creep”. As mentioned earlier, in many cases, it pulls the mortar joints into tension. The creep is notably bad in GFRC as seen here at the Lyric theater. My hand fit where this sky facing joint once held sealant.
Cast Stone

Park Avenue used cast stone replacement on the balconies. The cast stone absorbed moisture and corroded additional steel. Now ownership has to re-replace the balconies in their entirety. The material has continued to shrink over its lifespan and caused the joints to increase in size from its typical 3/8” joint to over an 1” thick.
In the case of Madison Avenue, the cast stone was a repair campaign that lasted 5 years!

Following a rainy day, you can visually see the differences between the two materials. The cast stone has absorbed so much moisture and effloresced to a point where it destroyed good terra cotta below as seen in the photo above.
In this photo you can see the difference between the cast stone decorative panel and the terra cotta cap left in place. The 5 year old cast stone did not maintain its pigment color.

Salt deposits have collected and corroded the steel behind and the lintel now needs to be replaced.
Here you see water running down the face of the terra cotta but absorbed into the cast stone. The result is that the steel column has rust jacked and now the entire column’s terra cotta ashlars require replacing. **What would have been a 300 piece terra cotta replacement has now turned into 5,646 pieces of replacement terra cotta.** This is due to the infiltration of water via the cast stone pieces and other open joints that corroded the supporting steel and ultimately cracked terra cotta that was in good shape prior to the last repair campaign.
Resin Based materials (Micro-Cotta)

Another material gaining popularity is resin based materials that have a different manufacturing technique but have similar results. Below is a project in DeKalb, IL. The non-profit historic theatre raised funds for its replacement campaign and ultimately lost. The material joints opened up due to material instability. Moisture entered and corroded steel AND destroyed some of the historic interior. The photo below is taken from the façade inspection report and the replacement material is grey and marked MC at the top.
Conclusion:

Given all the research, work, and effort that is invested into landmarking our districts and buildings, it seems a shame that the Landmark Preservation Commission would grant shortsighted developers the option to replace with alternative materials. If LPC is going to allow the Amended Rules to stand, then at the very least LPC should only allow the staff level approval the ability to approve replacement in kind and not alternative materials. The adverse effects alternative materials have on our buildings is clear and replacement in kind is supported nationally by National Parks, Historic Preservation organizations, the practicing professional, and higher quality contractors who prefer to work in this medium. Additionally, many Columbia and UPenn Historic Preservation theses have been written in support of replacement in kind.

During the testimony on March 27th at the LPC, there were only two people who testified in favor of the use of alternative materials. One was a developer who had a financial stake in “shortcutting” the system and allowing him to not preserve his buildings according to best practice. Financially, the developer is NOT gaining. There have been many studies by reputable NYC contractors who have illustrated the cost difference between the terra cotta replacement in kind and alternative materials. All things being equal, cost differences range from 10% to 30% on the materials alone. However, the developer must factor in the following added costs:

1. Maintenance to seal the sky facing joints by way of scaffolding and providing access to the contractor. This requires site safety permit, scaffold, remobilization, etc.
2. Longevity of the cast stone and GFRC is a fraction of the 100 year life cycle of terra cotta
3. Material “creep” and the ability to allow moisture to infiltrate the building envelope causing additional degradation

Additionally, our beloved LPC should heavily weigh the loss of ornamentation and massive fading.

Thank you for considering this testimony. I hope the job site photos help the Landmark Preservation Commissioners clearly see the effects of alternative materials have on our landmark buildings and thereby reconsider their stance when confronted with an application that begs for the use of the material, be it with the new amended landmark rules OR when an application is presented “with no effect”

Sincere Regards,

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