U.S. Department of Transportation
Federal Highway Administration

Memorandum

Subject: **ACTION:** Elevated Chloride Levels in SikaGrout® 300 PT Cementitious Grout

Date: November 23, 2011

From: King W. Gee
Associate Administrator
Office of Infrastructure

In Reply Refer To:
HIBT-1

To: Division Administrators
Directors of Field Services

The purpose of this memorandum is to inform you of an issue pertaining to varying levels of chloride found in grout used to fill tendon ducts in post-tensioned construction. The grout, SikaGrout® 300 PT, is a non-shrink, low-bleed cementitious material used to create a composite connection and provide a mechanical barrier between the high-strength steel strand tendons and infiltrating chlorides and water that may cause corrosion.

On October 26th , Sika informed FHWA that their 300 PT grout produced from November 2002 until March 2010 at the Sika plant in Marion, Ohio, contained significantly varying levels of chloride. These chloride levels ranged from being less than the specified limit of 0.08 percent by weight of cementitious material, to as much as 400 percent above that limit. This chloride limit is established by the AASHTO LRFD Bridge Construction Specifications (Table 10.9.3-2), is supported by FHWA and by concrete bridge industry organizations, and is asserted by Sika to be the limit for their 300 PT grout.

Sika has ceased the production of the 300 PT grout at the Marion Plant and is in the process of determining which batch lots of grout contained chlorides above the specified limit and what bridges might be affected. The Marion Plant produced 20,327,300 lbs. of this product from November 2002 to March 2010 with approximately 16,000,000 lbs of the grout used in bridge project post-tensioning applications. The attached table presents the bridge projects identified to date which received 300 PT grout from the Marion Plant. This is a working list - individual bridges will be added and subtracted as we discover more details about these and other projects.

The grout delivered for use on these projects may or may not contain levels of chlorides above the specified limit. Sika or their representative has approached most of the owners of these bridges to explain the situation and to arrange to conduct examinations of specific structures in order to determine if chlorides are present and at what level. In addition to

providing information on the condition of the bridge, these examinations will also help define which batch lots contained elevated levels of chlorides and, by extension, confirm the individual projects affected.

The existence of elevated chlorides in post-tensioning systems is not an immediate safety concern. While the existence of chlorides does not indicate corrosion, the existence does indicate increased corrosion potential. This type of concrete bridge construction is typically redundant, incorporating many tendons or alternate load paths that can overcome the unanticipated loss of one or more tendons. This has been demonstrated by bridges that have experienced a loss of post-tensioning force due to tendon corrosion and have performed adequately until the issue was identified and repaired. In addition, in these cases, this loss in force manifested itself as observable distress before becoming a significant safety concern.

The chloride content threshold in the affected grout is dependent on many factors and, as a result, is not very well understood. The FHWA is in the process of planning research to better define acceptable levels of chloride in post-tensioning tendon systems. This research is intended to provide FHWA with adequate information to support sufficient oversight of remedies that Sika proposes to bridge owners, and to assist bridge owners in making sound decisions if they encounter tendons with chloride levels above the specified level. It is anticipated that this research will begin soon and produce preliminary results in less than a year.

The FHWA will be working through its division offices to support the affected bridge owners and to ensure that the appropriate measures to address any short- or longer-term concerns are taken. In addition, FHWA intends to work with the AASHTO Subcommittee on Materials, the AASHTO Subcommittee on Bridges and Structures, and concrete bridge industry organizations to develop standard provisions that would prevent concerns of this nature in future bridge construction.

Please share this information with your corresponding State DOT. Other than that, no action is required at this time. Once the extent of the issue is better defined, we may forward additional information that will help bridge owners develop appropriate long-term solutions. Until then, for additional information, please contact Myint Lwin, Director, Office of Bridge Technology, at (202)366-4589.

Attachment

Table. Bridge projects with possible elevated chloride grout.

Bridge Project	State
Intersection 55 & 405 Freeway	CA
Big Cypress	FL
Garcon Point Bridge	FL
I-75/I-595 Interchange	FL
1259 South Loop Road	GA
I-285 Structures	GA
SR316 Jobsite on I-85 North	GA
I-355 Extension Bridge	IL
Flyover Bridge at Indianapolis Airport	IN
I-65 & I-80 Toll Road	IN
Edgemoor Bridge	KS
Hancock Brook Bridge	MA
Woodrow Wilson Bridge	MD/VA
Crosstown Project	MN
I-35W Bridge	MN
Wakota Bridge	MN
Junction of RA and 64 Highway	MO
US Highway 90	MS
US Highway 91	MS
Martin County Bridge over Smithwick	NC
4 Bears Bridge	ND
Bayonne Bridge	NJ
Trenton Morrisville Bridge	NJ
Victory Bridge	NJ
Fulton Street Bridge	OH
I-270 SR 161	OH
Intersection of SR266 & SR513	OH
Kentucky 22 over KY River	OH
Maumee River Crossing	OH
Allegheny River Bridge	PA
Denbo (Mon Fayette) Bridge	PA
Susquehanna Bridge	PA
Highway 133 & 87 Intersection	SC
Carbon Plant Road over IH 37	TX