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RESEARCH REPORT: RR 25598  
(CSI #03200)

Attn: Johnny Kwok, S.E. MBA  
(949) 476-7600

Expires: January 1, 2011  
Date Issued: February 1, 2009  
Code: 2008 LABC

**GENERAL APPROVAL** – Renewal/Technical Modification - MMFX deformed steel bars for use in the design of reinforced concrete mat and spread foundation systems using up to 100,000 psi yield strength.

**DETAILS**

MMFX deformed steel bars conform to ASTM A1035 specification as follows:

Mechanical Properties:

Steel Grade	Grade 100	Grade 120
Tensile strength, min. psi	150,000	150,000
Yield strength (0.2% offset), min. psi	100,000	120,000
Stress corresponding to an extension under load of 0.0035 in/in, min. psi	80,000	90,000
Elongation in 8 in min. %:		
#3 through #11	7	7
# 14, #18	6	---

Chemical Properties:

Steel Type Element	Type CS (High Cr) max. <sup>a</sup>	Type CL (Low Cr) max. <sup>a</sup>
Carbon	0.15%	0.17%
Chromium	8.0 to 10.9%	4.0 to 6.0%
Manganese	1.5%	1.5%
Nitrogen	0.05%	0.05%
Phosphorus	0.035%	0.035%
Sulfur	0.045%	0.045%
Silicon	0.50%	0.50%

<sup>a</sup>Maximum unless range is indicated. Percentages refer to weight percentages

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MMFX Technologies Corporation  
RE: MMFX deformed steel bars

Product name shall be specified in accordance to the following naming system, with Type (CS or CL) followed by Grade (100 or 120):

- MMFX CS100
- MMFX CS120
- MMFX CL100
- MMFX CL120

**The approval is subject to the following conditions:**

1. MMFX deformed steel bars may be used for design of reinforced concrete mat and spread foundation systems based on the following yield strength:  
Tension: 100,000 psi. Compression: 80,000 psi.
2. MMFX deformed steel bars, when designed using higher yield strength, shall have proportionally longer development length and lap length based on 60,000 psi yield strength prescribed in 2008 Los Angeles City Building Code.
- 3.. Test data from the mill or from a Los Angeles City approved testing agency shall verify the material in accordance with the above modified specifications for each job.
4. MMFX deformed steel bars shall be distinctly marked for field identification
5. All steel materials shall be identified as – “LARR 25598” on bar tags.
6. Mechanical couplers to develop full strength require a separate approval.
7. MMFX deformed steel bars shall not be welded, unless the welding protocol is provided by manufacture for specific applications and approved with an LARR.

MMFX Technologies Corporation  
RE: MMFX deformed steel bars

## **DISCUSSION**

The technical modification is to update details of the product in accordance with ASTM A 1035/ A 1035M-07 in file with Engineering Research Section.

The approval is in accordance with ACI 318-08.

This general approval of an equivalent alternate to the Code is only valid where an engineer and/or inspector of this Department has determined that all conditions of this approval have been met in the project in which it is to be used.

Addressee to whom this Research Report is issued is responsible for providing copies of it, complete with any attachments indicated, to architects, engineers and builders using items approved herein in design or construction which must be approved by Department of Building and Safety Engineers and Inspectors.

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