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RESEARCH REPORT: RR 25691T
(CSI #03200)

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GENERAL APPROVAL – Renewal/Technical Modification - MMFX deformed steel bars for use in the design of reinforced concrete confinement reinforcing using up to 100,000 psi yield strength per ACI-318-08 and 120,000 psi yield strength per ACI ITG-4.3 R-07.

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. ^a	Type CL (Low Cr) max. ^a
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%

^aMaximum unless range is indicated Percentages refer to weight percentages

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 CS 100
- MMFX CS120
- MMFX CL100
- MMFX CL120

The approval is subject to the following conditions:

1. MMFX deformed steel bars may be used for transverse confinement reinforcement in special moment frames, special structural walls, and coupling beams per Section 12.1.5 of ACI 318-08, and ACI ITG-4.3 R-07.
2. The value of f_{yt} used to compute the amount of confinement reinforcement shall not exceed 100,000 psi in accordance with ACI 318-08, and 120,000 psi in accordance with ACI ITG – 4.3 R-07.
- 3.. The value of f_y or f_{yt} used in design of shear reinforcement shall conform to 11.5.2 of ACI 318-05 or 11.4.2 of ACI 318-08.
4. Test data from the mill or from a Los Angeles City approved testing agency shall verify the material in accordance with ASTM A1035 for each job.
5. MMFX deformed steel bars shall be distinctly marked for field identification.
6. MMFX deformed steel bars shall not be field welded. Resistance welding performed in a shop of a fabricator licensed by the City of Los Angeles Building Department, in accordance with the welding protocol provided by manufacturer for specific application and approved with an LARR, is permitted.

MMFX Technologies Corporation
RE: MMFX deformed steel bars

DISCUSSION

The Technical Modification is to add the Mechanical Properties and Chemical Properties of MMFX deformed steel bars.

The approval of 100,000 psi is based on the published ACI 318-08. The approval of 120,000 psi is on a temporary basis pending on the adoption of ACI ITG-4.3 R-07 “Report on Structural Design and Detailing for High-Strength Concrete in Moderate to High Seismic Applications”.

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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