ChromX PROJECT APPLICATIONS AND AGENCY APPROVAL
ChromX (ASTM A 1035/AASHTO MP18) Concrete Reinforcing Steel and Pavement Dowel Bars

11444 East Germann Rd., Mesa, AZ 85212
Phone: 480.396.7124    Toll Free: 866.466.7878
www.cmc.com/chromx

© 2018 MMFX Technologies. All Rights Reserved.
# Table of Contents

1. **Project Applications** ................................................................................................................................. 3  
   A. Public Infrastructure Projects ...................................................................................................................... 3  
   B. Public and Private Building Development Projects ..................................................................................... 14  

2. **Agency Approvals** ................................................................................................................................. 25  
   A. State Transportation Departments ............................................................................................................. 26  
   B. Building Departments ............................................................................................................................... 27

---

The information and data in this document are accurate to the best of our knowledge and belief and are intended for general information only. MMFX Technologies cannot be held responsible for inaccuracies of any third party information contained herein. The information herein may be changed or updated at anytime without notice. All information contained herein is subject to MMFX's standard terms and conditions.

© 2018 MMFX Technologies - A Commercial Metals Company (MMFX). All rights reserved.
Since 2001, ChromX rebar has been used in various public infrastructure and public / private development projects in the United States, Canada, Mexico, Puerto Rico, Abu Dhabi — United Arab Emirates (UAE), and The Bahamas. Following is a representative list of some of those projects. These project applications illustrate the diverse geographical locations from Alaska to Florida and from New Jersey to California; and the Middle East where ChromX rebar has been used. These examples also demonstrate how AASHTO MP 18 / ASTM A1035/ bars have been utilized for their corrosion-resistant and high-strength material properties.

### A. Public Infrastructure Projects

<table>
<thead>
<tr>
<th>Item</th>
<th>Location/Project Description</th>
<th>Owner/Agency</th>
<th>Project Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Edmonton, AB – CAN Anthony Henday Drive Ring Road</td>
<td>Alberta MOT</td>
<td>Girders and abutment for 47 bridges Under construction 2013</td>
</tr>
<tr>
<td>3.</td>
<td>Winnipeg, MB - CAN Disraeli Freeway Bridge over Red River</td>
<td>Manitoba MOT</td>
<td>75 Year design life Columns, abutments, caps and deck - Constructed 2012</td>
</tr>
<tr>
<td>4.</td>
<td>Stockton, CA Daggett Road Bridge over Burns Cut-off</td>
<td>Port of Stockton</td>
<td>Bridge girders (100ksi design) Constructed 2006</td>
</tr>
<tr>
<td>5.</td>
<td>Folsom, CA Light Rail Bridge over Alder Creek</td>
<td>Sacramento Regional Transit Authority</td>
<td>Bridge — Abutments, columns and girder (100 ksi design) Constructed 2004</td>
</tr>
<tr>
<td>6.</td>
<td>Saskatoon, SK - CAN Circle Drive over South Saskatchewan River</td>
<td>Saskatchewan MOT</td>
<td>Bridge deck and columns Constructed 2012</td>
</tr>
<tr>
<td>8.</td>
<td>Bristol Co. VA Route 460 Connector Coal Fields Expressway</td>
<td>Virginia DOT</td>
<td>Pier Table (75 ksi design) and Bridge deck Under Construction 2013</td>
</tr>
<tr>
<td>9.</td>
<td>Richmond, VA - Huguenot Bridge (SR 147) over James River</td>
<td>Virginia DOT</td>
<td>Bridge Deck Completed 2013</td>
</tr>
<tr>
<td>10.</td>
<td>Spokane, WA US 395 North Spokane Corridor</td>
<td>Washington DOT Eastern Region</td>
<td>1.5” diameter by 18” pavement dowel bars - Constructed 2011</td>
</tr>
</tbody>
</table>
PROJECT 1 - State Hwy 100 - Vian, OK

State Hwy 100 over Illinois River Lake
Tenkiller Spillway - Vian, OK

Bridge - ChromX products were used for abutments, columns and deck (75 ksi design except precast elements).

Constructed 2006
PROJECT 2 - Anthony Henday Drive Ring Road - Edmonton, AB, CAN

ChromX rebar used for girders, abutment for 47 bridges. Completed 2013
Disraeli Freeway Bridge over Red River - Winnipeg, MB, CAN
75 Years design life. Columns, abutments, caps and deck built with ChromX. Constructed 2012
PROJECT 4 - Daggett Road Bridge - Stockton, CA

Daggett Road Bridge over Burns Cut-off, Stockton, CA
Bridge girders constructed with ChromX (100ksi design).
Constructed 2006

Girder Reinforcement
- Mild Steel

High Strength
MMFX Steel
PROJECT 5 - Light Rail Bridge - Folsom, CA

Light Rail Bridge over Alder Creek - Folsom, CA
Bridge – ChromX used in abutments, columns and girder (100 ksi design). Constructed 2004
PROJECT 6 - Circle Drive - Saskatoon, SK, CAN

Circle Drive over South Saskatchewan River - Saskatoon, SK, CAN
ChromX steel used to construct six-lane bridge deck and columns. Constructed 2012
PROJECT 7 - United States Navy Modular Hybrid Pier - San Diego, CA

United States Navy Modular Hybrid Pier
San Diego, CA
Floating US Navy Pier
ChromX corrosion-resistant reinforcing steel was used throughout entire structure.
Constructed 2004
Route 460 Connector, Coal Fields Expressway Bristol Co., VA
ChromX products used for pier table (75 ksi design) and bridge deck. Tallest bridge in Virginia. Completed 2013.
Huguenot Bridge (SR 147) over James River - Richmond, VA

Bridge deck was built with ChromX. Completed 2013
US 395 North Spokane Corridor – Spokane, WA
Corrosion-resistant 1.5” diameter by 18” pavement dowel bars using ChromX steel. Constructed 2011
## B. Public and Private Development Projects Constructed with ChromX Products

<table>
<thead>
<tr>
<th>Project</th>
<th>Location/Project Description</th>
<th>Owner/Agency</th>
<th>Project Information</th>
</tr>
</thead>
</table>
| 1. | Gulf Shores, AL  
Gulf State Park  
Fishing Pier | Alabama State Parks | Precast piling and substructure  
Constructed 2008 |
| 2. | Miami, FL  
Everglades on the  
Bay Condominiums | CABI Developers | 49 floor Condominium Foundation (80 ksi design)  
Constructed 2007 |
| 3. | San Francisco, CA  
California Academy  
Exhibition, Education and Research Center | California Academy of Sciences | Building foundation and aquarium tank reinforcement – project awarded platinum LEED  
Constructed 2008 |
| 4. | Hostotipaquillo, Jalisco, Mexico  
750 Mw  
La Yesca Hydroelectric Dam | CFE (Comisión Federal de Electricidad) Mexico | Diversion Tunnel Plugs  
Grade 120 material certification  
208 Meter high concrete-faced rock-fill dam  
Constructed 2012 |
| 5. | Grand Isle, LA  
North Expansion at Port Fourchon | Edison Chouest Offshore | Oil field service docks - drill shaft piles and caps (100 ksi design)  
Constructed 2009 |
| 6. | Seattle, WA  
Escala Condominiums | Lexas Development | 31 floors above grade and 8 floors below grade - columns and shear walls (100 ksi design of seismic confinement ties)  
Constructed 2008 |
| 7. | Abu Dhabi, UAE  
Al Sowwah Island  
Diaphragm Wall | Mubadala Development | 1.5 km long diaphragm wall  
(600 MPa design)  
Constructed 2011 |
| 8. | Juneau, AK  
Ted Stevens Research Center | NOAA –National Oceanic & Atmospheric Administration | Wet well pump station and filter house  
Constructed 2006 |
| 9. | Port Orchard, WA  
Floating Marina Breakwater | Port of Bremerton | Floating Breakwater  
100 ksi corner reinforcement  
Constructed 2006 |
| 10. | Bay St. Louis, MS  
North Beach Blvd  
Seawall | US Army Corps of Engineers Mobile District | 6000 ft long coastal seawall  
Constructed 2011 |
PROJECT 1 - Gulf State Park Fishing Pier - Gulf Shores, AL

Gulf State Park Fishing Pier - Gulf Shores, AL
1,540 ft long precast piling and substructure built with ChromX. Constructed 2008
Everglades on the Bay Condominiums, Miami, FL
ChromX products used in 49-floor condominium and foundation (80 ksi design). Constructed 2007
PROJECT 3 - California Academy of Sciences Exhibition and Research Center - San Francisco, CA

California Academy of Sciences
Exhibition and Research Center,
San Francisco, CA

Building foundation and aquarium
tank reinforcement built with ChromX.
Project awarded platinum LEED.
Constructed 2008
La Yesca Hydroelectric Dam - Hostotipaquillo, JAL, MEX

ChromX used in diversion tunnel plugs grade 120 material certification
208-meter high concrete-faced rock-fill dam.
Constructed 2012
PROJECT 5 - Northern Expansion at Port Fourchon - Grand Isle, LA

Northern Expansion at Port Fourchon, Grand Isle, LA
Oil field service docks - drill shaft piles and caps utilized ChromX (100 ksi design).
Constructed 2009
PROJECTS

PROJECT 6 - Escala Condominiums - Seattle, WA

Escala Condominiums
Seattle, WA
31 floors above grade and 8 floors below grade - columns and shear walls built with ChromX (100 ksi design of seismic confinement ties).
Constructed 2008
PROJECT 7 - Al Sowwah Island Diaphragm Wall - Abu Dhabi, UAE

ChromX used to construct 1.5 km long diaphragm wall (600 MPa design). Constructed 2011
PROJECT 8 - NOAA Ted Stevens Research Center - Juneau, AK

NOAA Ted Stevens Research Center, Juneau, AK
Wet well pump station and filter house built with ChromX.
Constructed 2006
PROJECT 9 - Floating Marina Breakwater - Port Orchard, WA

Floating Marina Breakwater, Port Orchard, WA
Floating breakwater 100 ksi corner reinforcement. Constructed 2006
North Beach Blvd Seawall
Bay St. Louis, MS
US Army Corps of Engineers,
ChromX used to build
6000 ft. long coastal seawall.
Constructed 2011
ChromX (ASTM A1035/AASHTO MP 18) rebar has been designed and/or used in various private development projects in: Alabama, Bahamas, California, Florida, Georgia, Illinois, Kentucky, Louisiana, Minnesota, Missouri, Mississippi, Montana, Nevada, New Jersey, New York, North Carolina, Oregon, Tennessee, Texas, Virginia, and Washington. These project applications include: building slabs, piles, foundations, columns, shear walls and beams designed to either utilize the superior corrosion and or mechanical properties of the ChromX steel bars.

Public Agency Infrastructure Usage: Since ChromX rebar’s introduction into the market place in 2001, it has been used in more than 100 bridge projects, located in: 27 states, 4 Canadian provinces, Puerto Rico and the Bahamas. The following state transportation agencies have been designed and/or constructed with ChromX: bridge decks, other structural members, and/or using pavement dowel bars.

### 2. AGENCY APPROVALS

| Alabama DOT | Kentucky Transportation Cabinet | Oklahoma DOT |
| Arizona DOT CALTRANS | Massachusetts DOT | Pennsylvania DOT |
| Colorado DOT | Maine DOT | South Carolina DOT |
| Connecticut DOT | Michigan DOT | Texas DOT |
| Delaware DOT | New Hampshire DOT | Utah DOT |
| Florida DOT | New Mexico DOH&T | Vermont DOT |
| Idaho DOT | North Carolina DOT | Virginia DOT |
| Indiana DOT | Ohio DOT | Washington DOT |
| Iowa DOT | | Wisconsin DOT |

In addition, the following government agencies also have used ChromX rebar in their reinforced concrete structures:

- Ada County Highway Department, Idaho
- Alberta Ministry of Transportation
- British Columbia Ministry of Transportation
- Cities of: Boca Raton, Daytona, Jupiter, New Smyrna, St. Petersburg, Florida; Atlanta, Georgia; Chicago, Illinois; Winnipeg, Manitoba; St. Paul, Minnesota; Bayonne, New Jersey; Carlsbad, Raton, New Mexico
- CFE, Comisión Federal de Electricidad, Mexico
- Counties of: Los Angeles, California; Lee, Pinellas, Florida; Cuyahoga, Hamilton, Ohio; Kitsap, Washington
- Manitoba Highway Department
- NASA (National Aeronautics and Space Administration)
- National Oceanic and Atmospheric Administration (NOAA)
- New Brunswick Ministry of Transportation
- New York State Thruway Authority
- Pennsylvania Turnpike Authority
- Port of Bremerton - Washington
- Port of Stockton - California
- Puerto Rico Departamento de Transportacion y Obras Publicas
- Sacramento Regional Transit District, California
- States of Alabama, Hawaii, Nebraska and Oregon
- U.S. Air Force
- U.S. Army Corps of Engineers, Tulsa District
- U.S. Naval Facilities Command
- U.S. Veterans Administration
- Virginia Port Authority
- VANOC (Vancouver Olympic Committee)
### A. Transportation Department Approvals

<table>
<thead>
<tr>
<th>Name of Agency</th>
<th>Approval Date</th>
<th>Name &amp; Phone Number of Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama DOT</td>
<td>02-03-04</td>
<td>Billy Bullard (334) 206-2209</td>
</tr>
<tr>
<td>Alberta Transportation</td>
<td>Trial Products 11-24-09</td>
<td>Roger Skirrow (780) 427-7761</td>
</tr>
<tr>
<td>CALTRANS (A)</td>
<td>06-11-09</td>
<td>L. Janie Spencer (916) 227-7073</td>
</tr>
<tr>
<td>Colorado DOT</td>
<td>02-11-05</td>
<td>David Kotzer (303) 757-9421</td>
</tr>
<tr>
<td>Georgia DOT</td>
<td>12-11-03</td>
<td>Reggie Fry (404) 363-7619</td>
</tr>
<tr>
<td>Idaho DOT</td>
<td>07-30-04</td>
<td>Steve Loop (208) 334-2867</td>
</tr>
<tr>
<td>Manitoba Infrastructure and Transportation (MIT)</td>
<td>06-2010</td>
<td>Tara Liske (204) 945-1941</td>
</tr>
<tr>
<td>New Mexico Dept. of Highways and Transportation</td>
<td>10-23-02</td>
<td>Ernest Archulata (505) 827–5100</td>
</tr>
<tr>
<td>North Carolina DOT</td>
<td>Approved for Provisional Use 07-08-10</td>
<td>Leigh M. Wing (919) 508-1860</td>
</tr>
<tr>
<td>Texas DOT</td>
<td>(B) APEL 03-22-04</td>
<td>Randy Cox, P.E. (512) 416-2189</td>
</tr>
<tr>
<td>Utah DOT</td>
<td>(C) 04-25-05</td>
<td>Barry Sharp (801) 965-4314</td>
</tr>
<tr>
<td>Washington State DOT</td>
<td>(D) 06-24-05</td>
<td>John Livingston (360) 709-5472</td>
</tr>
</tbody>
</table>

**Notes:**
- (A) CALTRANS SSP 40-010 “Jointed Plain Concrete Pavement” & SSP 40-025 “Continuous Reinforced Concrete Pavement”
- (B) APEL (AASHTO Product Evaluation List)
- (C) Standard Special Provision 03211S - Reinforcing Steel and Welded Wire, March 2009
- (D) Pavement Dowel Bars
B. Building Department Approvals

The following building departments have approved the use of ChromX in various flexural elements (i.e. mat foundations, shear walls etc.) as noted in their approval documents. (Contact MMFX Technologies for copies of approval letters.) Also the International Code Council (ICC) Subsidiary ICC ES (Evaluation Service) during 2013 published ICC ES Evaluation Report ESR 2107. This report provides guidance to building departments and engineering firms how ChromX (ASTM A1035 Gr. 100) high strength bars can be designed into structures thru its references to the 2012 IBC and ACI 318.

<table>
<thead>
<tr>
<th>Name of Agency</th>
<th>Approval Date</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Long Beach, California Planning and Building Department</td>
<td>03-17-06</td>
<td>Approved for 100 ksi foundation systems only</td>
</tr>
<tr>
<td>City of Miami, Florida Building Department</td>
<td>09-08-06</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>City of North Bay Village, Florida Building &amp; Zoning Department</td>
<td>06-28-06</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>City of Orlando, Florida Division of Building Safety</td>
<td>09-18-06</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>City of San Diego, California Department of Development Services</td>
<td>05-10-05</td>
<td>Project approval 100 ksi foundation systems only</td>
</tr>
<tr>
<td>Clark County (Las Vegas), Nevada Department of Development Services</td>
<td>03-13-06</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>Miami – Dade County, Florida Building Code Compliance Office</td>
<td>08-15-06</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>Sarasota County, Florida Permitting Services</td>
<td>10-21-05</td>
<td>Approved for 100 ksi foundation systems and superstructures</td>
</tr>
<tr>
<td>City of Irvine, California</td>
<td>12-12-06</td>
<td>Approved for 100 ksi foundation systems</td>
</tr>
</tbody>
</table>