

COMMERCIAL METALS COMPANY

CHROMX[®]



Project Applications and Agency Approval

ChromX[®] (ASTM A 1035/AASHTO MP18) Concrete Reinforcing Steel and Pavement Dowel Bars



FOR MORE INFORMATION:

website:
cmc.com/chromx

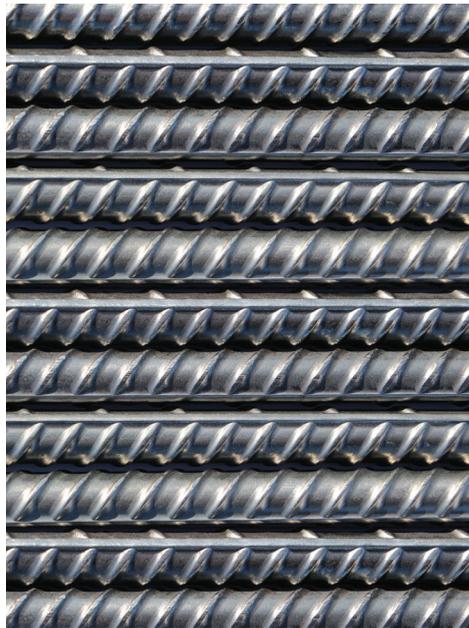
email:
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or contact:
your local CMC sales representative

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Project Applications

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

| Item | Location Project Description | Owner/Agency | Project Information |
|------|---|--|--|
| 1. | Vian, OK - Sequoya Co. State Hwy 100 over Illinois River Lake Tenkiller Spillway Channel Bridge | Army Corps of Engineers Tulsa Dist. | Bridge - Abutments, columns and deck (75 ksi design except precast elements) Constructed 2006 |
| 2. | Edmonton, AB – CAN Anthony Henday Drive Ring Road | Alberta MOT | Girders and abutment for 47 bridges Under construction 2013 |
| 3. | Winnipeg, MB - CAN Disraeli Freeway Bridge over Red River | Manitoba MOT | 75 Year design life Columns, abutments, caps and deck - Constructed 2012 |
| 4. | Stockton, CA Daggett Road Bridge over Burns Cut-off | Port of Stockton | Bridge girders (100ksi design) Constructed 2006 |
| 5. | Folsom, CA Light Rail Bridge over Alder Creek | Sacramento Regional Transit Authority | Bridge – Abutments, columns and girder (100 ksi design) Constructed 2004 |
| 6. | Saskatoon, SK - CAN Circle Drive over South Saskatchewan River | Saskatchewan MOT | Bridge deck and columns Constructed 2012 |
| 7. | San Diego, CA Modular Hybrid Pier | US Navy – NFSEC (Naval Facilities Engineering Command) | Floating US Navy Pier Corrosion resistance reinforcing steel throughout entire structure - Constructed 2004 |
| 8. | Bristol Co. VA Route 460 Connector Coal Fields Expressway | Virginia DOT | Pier Table (75 ksi design) and Bridge deck Under Construction 2013 |
| 9. | Richmond, VA - Huguenot Bridge (SR 147) over James River | Virginia DOT | Bridge Deck Completed 2013 |
| 10. | Spokane, WA US 395 North Spokane Corridor | Washington DOT Eastern Region | 1.5" diameter by 18" pavement dowel bars - Constructed 2011 |

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

Anthony Henday Drive Ring Road - Edmonton, AB, CAN



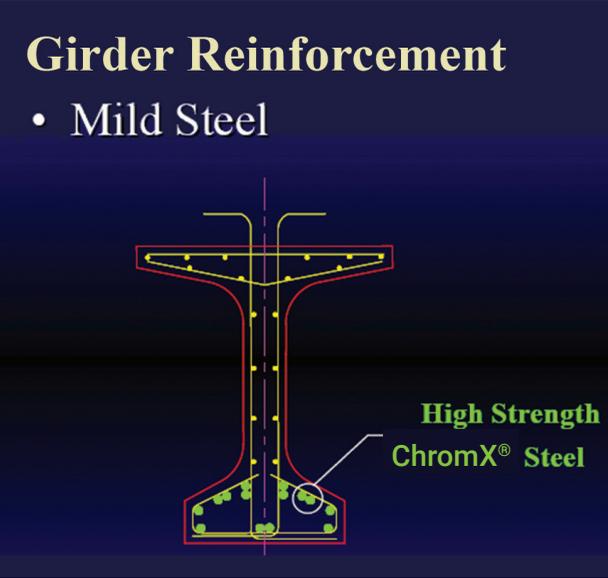
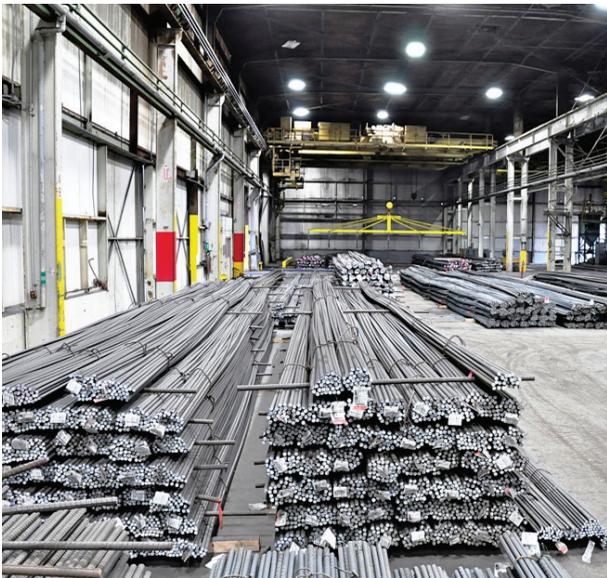
Anthony Henday Drive Ring Road - Edmonton, AB, CAN
ChromX® rebar used for girders, abutment for 47 bridges.
Completed 2013

Disraeli Freeway - Winnipeg, MB, CAN



Disraeli Freeway Bridge over Red River - Winnipeg, MB, CAN
75 Years design life. Columns, abutments, caps and deck built with ChromX®.
Constructed 2012

Daggett Road Bridge - Stockton, CA



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

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



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

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 - Bristol Co., VA



**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) - Richmond, VA



Huguenot Bridge (SR 147) over James River - Richmond, VA
Bridge deck was built with ChromX®.
Completed 2013

US 395 North Spokane Corridor - Spokane, WA



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

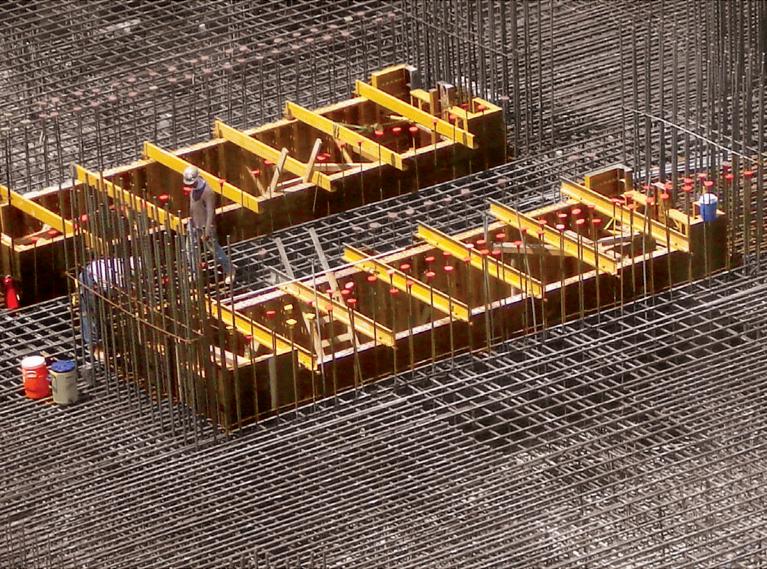
| Project | Location Project Description | Owner/Agency | Project Information |
|---------|---|---|---|
| 1. | Gulf Shores, AL Gulf State Park Fishing Pier | Alabama State Parks | Precast piling and substructure Constructed 2008 |
| 2. | Miami, FL Everglades on the Bay Condominiums | CABI Developers | 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 |

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



Everglades on the Bay Condominiums, Miami, FL
ChromX® products used in 49-floor condominium and foundation (80 ksi design).
Constructed 2007

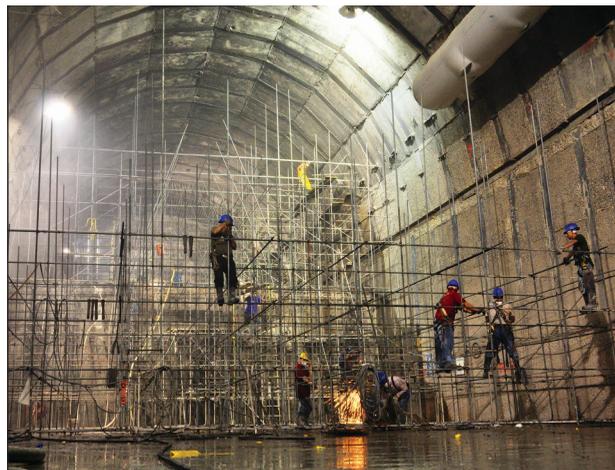
California Academy of Sciences Exhibition and Research Center - San Francisco, CA



**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



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

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

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



Al Sowwah Island Diaphragm Wall - Abu Dhabi, UAE



Al Sowwah Island Diaphragm Wall, Abu Dhabi, UAE
ChromX® used to construct 1.5 km long diaphragm wall (600 MPa design). Constructed 2011

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

Floating Marina Breakwater - Port Orchard, WA



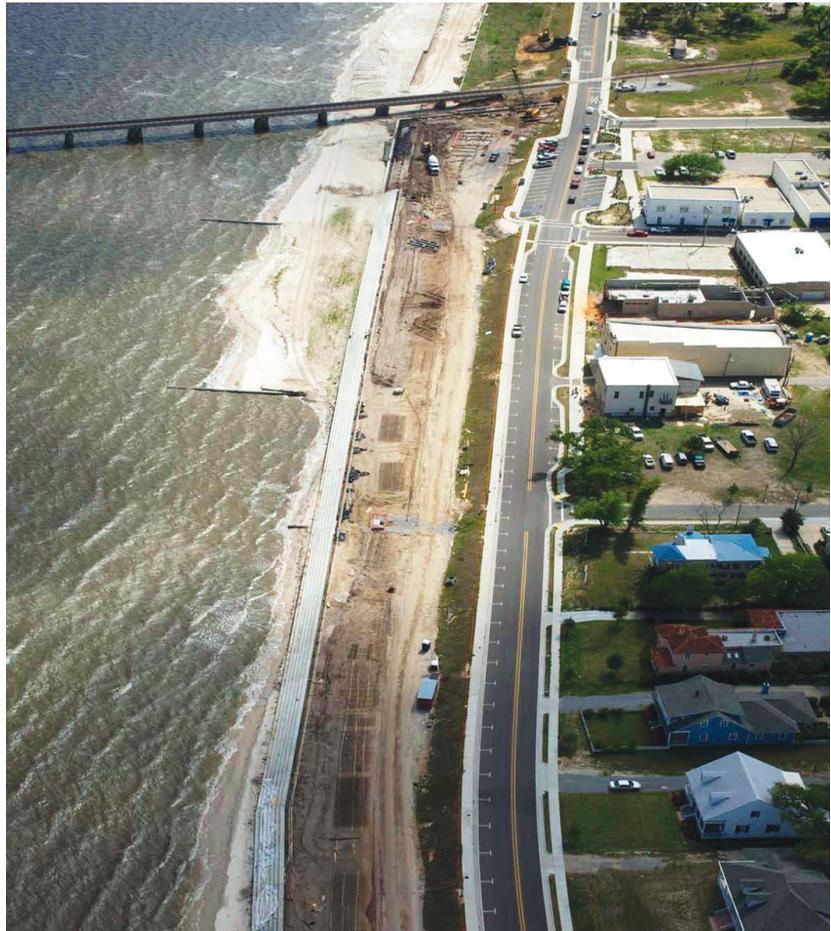
Floating Marina Breakwater, Port Orchard, WA
Floating breakwater 100 ksi corner reinforcement.
Constructed 2006



North Beach Blvd Seawall - Bay St. Louis, MS



**North Beach Blvd Seawall
Bay St. Louis, MS**
US Army Corps of Engineers,
ChromX® used to build
6000 ft. long coastal seawall.
Constructed 2011



2. Agency Approvals

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.

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

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

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 Commercial Metals Company 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 as to how ChromX® (ASTM A1035 Gr. 100) high strength bars can be designed into structures through its references to the 2012 IBC and ACI 318.

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



it's what's **inside** that counts

We're Commercial Metals Company – CMC, for short. You'll find our steel in sports stadiums and public buildings as well as highways, bridges, railways and other structures nearly everywhere on the planet.

To serve this global market, CMC maintains facilities across the United States, Europe and Asia. These sites include everything from local recycling centers, steel mini-mills and micro-mills to large-scale fabrication centers, heat-treating facilities and other metals-related operations.

RECYCLING | MILLS | FABRICATION cmc.com