



SECTION 05 15 00

WIRE ROPE ASSEMBLIES-STAINLESS STEEL

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PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Stainless Steel Wire Rope Assemblies
 - 2. Stainless Steel Fittings, End Terminals, Hardware, and Accessories
- B. Related Sections:
 - 1. Section 4 - Masonry Anchoring and Reinforcing
 - 2. Section 5 - Metal Stairs
 - 3. Section 5 - Metal Railings
 - 4. Section 5 – Stainless Steel Wire Rope Assemblies
 - 5. Section 5 – Decorative Metal Railings
 - 6. Section 6 – Wood Stairs and Railings
 - 7. Section 32 – Planting Accessories

1.02 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. American Society for Testing and Material (ASTM International)
 - 1. ASTM A380 - Practice for Cleaning and Descaling Stainless Steel Parts, Equipment and Systems.
 - 2. ASTM A492 - Specification for Stainless Steel Rope Wire.
 - 3. ASTM A554 – Welded Stainless Steel Mechanical Tubing.
 - 4. ASTM A554 – Specification for Welded Stainless Steel Mechanical Tubing

5. ASTM A555 - Stainless Steel Wire.
 6. ASTM E985 – Standard Specification for Permanent Metal Railing Systems and Stairs for Buildings
 7. ASTM F1145 - Specification for Turnbuckles, Swaged, Welded, Forged.
- C. Military Specification (MIL)
1. MIL-C-5688 - Pre-Stretching and Proof-Testing of Wire Rope Assemblies.
 2. MIL-W-83420 - Wire Rope, Flexible for Aircraft Control.
 3. MIL-W-87161 – Wire Stranded, Non Flexible for Aircraft Control. Oil Free Condition.

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide Stainless Steel Cable Railing System and mounting hardware which have been manufactured and installed to meet or exceed manufacturer's and project performance criteria.

1.04 SUBMITTALS

- A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit Manufacturer's product data sheet for specified products.
- C. Shop Drawings: Show layout, sizes, dimensions, details, and installation of railing frame components. Include Details of rope attachment, tensioning methods, hardware, and tensioning and mounting methodology.
- D. Samples: Submit samples of rope and/or hardware, as required by specifier.
- E. Quality Assurance/Control Submittals:
1. Test reports: Submit any test report demonstrating compliance with intended use and code requirements.
 2. Certificates: Submit manufacturer's certificate that product meets or exceeds specified requirements
- F. Closeout Submittals: Submit the Following:
1. Warranty: Submit manufacturer's standard warranty documents
 2. Maintenance Data: Include manufacturer's standard cleaning and maintenance instructions to avoid detrimental actions to finishes and performance.

1.05 QUALITY ASSURANCE

- A. Qualifications:
1. Installer Qualifications: Installer should be experienced in performing work of this section and should have specialized in installation of work similar to that required for this project.

- B. Regulatory Requirements and Approvals:
 - 1. [Code Agency Name]
 - a) [Report or Approval Description]
- C. Mock-Ups: Mock-Ups: Install at project site or appropriate location a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's approval of product, application, and workmanship standards. Comply with Division 1 Quality Control (Mock-Up Requirements) Section.
 - 1. Mock-Up Size: [Specify mock-up size and fixation requirements].
 - 2. Maintenance and Disposal: Maintain mock-up during construction for workmanship comparison.
 - a) Removal: Remove and legally dispose of mock-up when no longer required.
 - b) Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- D. Pre-Installation Meetings: Conduct with [Contractor, Architect, Fabricator, Installer and any other subcontractors] whose work involves cable railing system to verify project requirements, framing and support conditions, mounting surfaces, manufacturer's installation instructions, and warranty requirements. Comply with Division 1 requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with Division 1 Product Requirements Sections Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Delivery: Deliver in manufacturer's original, unopened, undamaged containers, identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store cartons and panels in a secure location in a dry place at the project site.

1.07 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.

PART 2 PRODUCTS

2.01 I-SYS® INOX STAINLESS STEEL WIRE ROPE ASSEMBLIES

A. Manufactured and sold by: Carl Stahl-DécorCable Innovations LLC, 660 W. Randolph Street, Chicago, IL USA 60661. Tel: 800-444-6271, Fax: 312-474-1789, E: sales@decorable.com, Web: www.decorable.com.

B. Proprietary Products/Systems: I-SYS® INOX Brand Stainless Steel Wire Rope Assemblies.

1. Material:

- a) Cable: ASTM A492 Type 316 stainless steel 7x7 or 7x19 wire rope, or 1x19 strand.
- b) Fittings, Hardware, and Accessories: AISI 304, 316 or 316L stainless steel

2. Rope Stock Number, Composition, Diameter, Min. Breaking Load (MBL) and MQ (mm²):

a) General Use 7x7 rope construction:

- 1) #820-0100- Ø 1mm (3/64"), 56 lbs. MBL, .43mm² MQ
- 2) #820-0200- Ø 2mm (5/64"), 501 lbs. MBL, 1.71mm² MQ
- 3) #820-0300- Ø 3mm (1/8"), 1120 lbs. MBL, 3.85mm² MQ
- 4) #820-0400- Ø 4mm (5/32"), 2000 lbs. MBL, 6.85mm² MQ
- 5) #820-0500- Ø 5mm (3/16"), 3135 lbs. MBL, 10.70mm² MQ
- 6) #820-0600- Ø 6mm (1/4"), 4500 lbs. MBL, 15.42mm² MQ
- 7) #820-0800- Ø 8mm (5/16"), 8020 lbs. MBL, 27.40mm² MQ

b) General Use, High Flexibility 7x19 rope construction:

- 1) #830-0200- Ø 2mm (5/64"), 636 lbs. MBL, 1.66mm² MQ
- 2) #830-0300- Ø 3mm (1/8"), 1050 lbs. MBL, 3.73mm² MQ
- 3) #830-0400- Ø 4mm (5/32"), 1868 lbs. MBL, 6.63mm² MQ
- 4) #830-0500- Ø 5mm (3/16"), 2912 lbs. MBL, 10.36mm² MQ
- 5) #830-0600- Ø 6mm (1/4"), 4210 lbs. MBL, 14.92mm² MQ
- 6) #830-0800- Ø 8mm (5/16"), 7480 lbs. MBL, 26.53mm² MQ
- 7) #830-1000- Ø 10mm (13/32"), 11670 lbs. MBL, 41.45mm² MQ
- 8) #830-1200- Ø 12mm (15/32"), 16822 lbs. MBL, 59.69mm² MQ
- 9) #830-1400- Ø 14mm (9/16"), 22848 lbs. MBL, 81.25mm² MQ
- 10) #830-1600- Ø 16mm (5/8"), 29790 lbs. MBL, 106.12mm² MQ
- 11) #830-2000- Ø 20mm (25/32"), 46368 lbs. MBL, 182.21mm² MQ

c) General Use, Higher Stiffness and Strength 1x19 stranded construction:

- 1) #810-0200- Ø 2mm (5/64"), 736 lbs. MBL, 2.39mm² MQ
- 2) #810-0300- Ø 3mm (1/8"), 1662 lbs. MBL, 5.37mm² MQ
- 3) #810-0400- Ø 4mm (5/32"), 2956 lbs. MBL, 9.55mm² MQ
- 4) #810-0500- Ø 5mm (3/16"), 4614 lbs. MBL, 14.92mm² MQ
- 5) #810-0600- Ø 6mm (1/4"), 6652 lbs. MBL, 21.49mm² MQ
- 6) #810-0800- Ø 8mm (5/16"), 11065 lbs. MBL, 38.20mm² MQ
- 7) #810-1000- Ø 10mm (13/32"), 17292 lbs. MBL, 59.69mm² MQ
- 8) #810-1200- Ø 12mm (15/32"), 23296 lbs. MBL, 85.95mm² MQ
- 9) #810-1400- Ø 14mm (9/16"), 29344 lbs. MBL, 116.99mm² MQ
- 10) #810-1600- Ø 16mm (5/8"), 39424 lbs. MBL, 152.81mm² MQ
- 11) #810-1900- Ø 19mm (3/4"), 52192 lbs. MBL, 215.48mm² MQ
- 12) #810-2200- Ø 22mm (7/8"), 66976 lbs. MBL, 288.90mm² MQ

13) #810-2600- Ø 26mm (/32"), 93184 lbs. MBL, 403.51mm² MQ

d) Structural Use, Very High Stiffness/Strength 1x37 or 1x61 stranded construction. May require special hardware and end fittings. Consult catalog or Carl Stahl-DecorCable.

- 1) #610-1600- Ø 16mm (5/8"), 1 x 37, 41350 lbs. MBL, 150.80mm² MQ
- 2) #610-1800- Ø 18mm (23/32"), 1 x 37, 50960 lbs. MBL, 190.80mm² MQ
- 3) #610-2200- Ø 22mm (7/8"), 1 x 61, 72128 lbs. MBL, 285.10mm² MQ
- 4) #610-2600- Ø 26mm (/32"), 1 x 61 99680 lbs. MBL, 398.20mm² MQ

e) Structural Use, Very High Stiffness/Strength 1x19 or 1x36 compressed strand construction. May require special hardware and end fittings. Consult catalog or Carl Stahl-DecorCable for details.

- 1) #0153-10-80CS Ø 8mm (5/16"), 1 x 19, 50960 lbs. MBL, 190.80mm² MQ
- 2) #0153-11-00CS Ø 10mm (13/32"), 1 x 19, 21952 lbs. MBL, 72.26mm² MQ
- 3) #0153-11-20CS Ø 12mm (15/32"), 1 x 19, 31842 lbs. MBL, 104.05mm² MQ
- 4) #0153-11-40CS Ø 14mm (15/32"), 1 x 36, 43480 lbs. MBL, 140.08mm² MQ
- 5) #0153-11-60CS Ø 16mm (5/8"), 1 x 36, 56878 lbs. MBL, 182.97mm² MQ

3. Swaged and Field Installed End Fittings and Terminals:

- a) External Thread-Swaged RH Stock #850, LH Stock #855.
- b) External Thread-F30 Low Profile Hammer Swaged RH Stock #948, LH Stock #949.
- c) External Thread-F50 Super Low Profile Hammer Swaged RH Stock #950, LH Stock #951.
- d) External Thread Swivel-Swaged RH Stock #850
- e) External Thread-Field Installed RH Stock #850, LH Stock #850.
- f) BW-External Thread-Field Installed RH Stock #751, LH Stock #752.
- g) Internal Thread-Swaged RH Stock #860, LH Stock #861.
- h) Internal Thread Swivel-Swaged RH Stock #857
- i) Internal Thread-Field Installed RH Stock #860, LH Stock #860.
- j) Swaged Fork (Clevis) -Stock #881
- k) CS-Swaged Fork (Clevis) -Stock #947
- l) BW-Swaged Fork (Clevis) -Stock #847
- m) BW-Fork (Clevis) Field Installed -Stock #754
- n) Roll Swaged Fork for Stranded Wire -Stock #681
- o) Fork with Internal Thread-Swaged RH Stock #812, LH Stock #811.
- p) Fork and Swage w/Turnbuckle -Stock #870
- q) Roll Swaged Fork and Turnbuckle for Stranded Wire -Stock #670
- r) Swaged Eye-Stock #880
- s) CS-Swaged Eye-Stock #980
- t) BW-Eye Field Installed -Stock #753
- u) Eye with Internal Thread-Swaged RH Stock #814, LH Stock #813.
- v) Eye and Swage w/Turnbuckle -Stock #889
- w) Swaged Radius Head End Stop-All -Stock #869
- x) Swaged End Stop -Stock #865
- y) Swaged Countersunk Head End Stop-All -Stock #866
- z) Compressed Loop w/o Thimble-Stock #801/803
- aa) Compressed Loop w/ Thimble-Stock #802/804
- bb) Loop Clamp w/ Thimble-Stock #874

4. In-Line Tension Devices:

- a) Turnbuckle with Swaged External Thread ends Stock #829.
- b) Turnbuckle with F30 Hammer Swaged External Thread ends Stock #829.
- c) Internal Thread-Field Installed RH Stock #860, LH Stock #860.

5. Fittings with External and Internal Threads

- a) Fork with External Thread RH Stock #871, LH Stock #872.
- b) Fork with Internal Thread RH Stock #817, LH Stock #818.
- c) BW-Fork with External Thread RH Stock #845, LH Stock #846
- d) CS-Fork with External Thread RH Stock #945, LH Stock #946
- e) CS-Fork with Internal Thread RH Stock #917, LH Stock #918
- f) Eye with External Thread RH Stock #885, LH Stock #886.
- g) Eye with Internal Thread RH Stock #806, LH Stock #807.
- h) CS-Eye with External Thread RH Stock #985, LH Stock #986
- i) CS-Eye with Internal Thread RH Stock #906, LH Stock #907
- j) Eye counter-piece RH Stock #887
- k) Eye Bolt with External Thread RH Stock #888, LH-Stock #888
- l) Radius Head End Stop with Internal Thread RH only-Stock #869
- m) Countersunk Head End Stop with Internal Thread RH only-Stock #866
- n) Ball Head End Stop with Internal Thread RH only-Stock #868
- o) Fork with External Thread RH Stock #871, LH Stock #872.
- p) Fork with Internal Thread RH Stock #817, LH Stock #818.
- q) BW-Fork with External Thread RH Stock #845, LH Stock #846
- r) CS-Fork with External Thread RH Stock #945, LH Stock #946
- s) CS-Fork with Internal Thread RH Stock #917, LH Stock #918

6. Clamps, Hardware, Accessories:

- a) Cross Clamp-Stainless Steel-Specify Type-Stock #858
- b) Cross Clamp-UV Resistant Plastic-Stock #920
- c) Light Clamp Ring-Stainless Steel-Specify Type-Stock #863
- d) Std. Clamp Ring-Stainless Steel-Specify Type-Stock #873
- e) Post Fittings-Stainless Steel-Specify Type and Degree-Stock #862
- f) Ball End with Internal Thread RH Stock #898, LH Stock #898
- g) Ball End for Radius End Stop-Stock #899
- h) Loose Sleeve-Stock #864
- i) Shackle-Specify Type-Stock #835
- j) Eye Bolt-Stock #837
- k) Eye Nut-Stock #838
- l) Washer-Specify Type-Stock #896
- m) Hex Nut-Specify Type-RH Stock #892, LH Stock #893
- n) Dome Nut-RH -Stock #894
- o) Turnbuckle-Specify Type-Stock #875
- p) Hex Head Bolt-Stock #843
- q) Socket Head Bolt-Stock #844
- r) Pan Head Screw-Stock #890
- s) Dual Thread Screw-RH Stock #878, LH Stock #877
- t) Rampa Nut for Wood, Stock #803
- u) Cover Disk with Internal Threads -RH Stock #836, LH Stock #836
- v) Threaded Rod (Headless Screw)-RH Stock #882, LH Stock #883
- w) Headless Screw-RH/LH Stock #884
- x) Wall Anchor for Masonry with Internal Thread RH Stock #803
- y) Wall Anchor for Masonry with External Thread RH Stock #803
- z) Fork Bracket -Stock #834

Length:

- a) Provide optimum adjustment in both directions by calculating final tendon lengths with allowance for tensioning fittings with 2/3 open and with 1/3 of thread length engaged.
- b) Measure tendon length from center of pin to center of pin, or center of eye to center of eye.

2.02 PRODUCT SUBSTITUTIONS

- A. Substitutions: No substitutions permitted.

2.03 FITTINGS AND ACCESSORIES

- A. Accessories: Provide grommet, bushings, nuts, washers, turnbuckles, fittings and other components as required for system installation

2.04 FABRICATION

- A. Stainless Steel Cables and Fittings shall be dimensioned and fabricated to specified size and labeled according to shop drawings and installer's specifications.
- B. Preassemble items in shop to greatest extent practicable to minimize assembly at project site. Disassemble units only to extent necessary for shipping and handling limitations. Mark units for reassembly.

2.05 FINISHES

- A. Clean and/or descale cables and fittings in accordance with ASTM A380.
- B. Passivate in accord with ASTM B912, to provide the following finish: Exterior and Interior: 330 grain satin finish (equiv. to #4 satin finish).

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify condition existing support system which has been previously installed under other sections, to ensure it is acceptable for product installation in accordance with manufacturer's instructions. Do not begin installation until backup surfaces are in satisfactory condition.

3.03 PREPARATION

- A. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.
- B. Take field measurements after permanent end terminations are in place and prior to preparation of shop drawings and fabrication, to ensure fitting of work.

3.04 INSTALLATION

- A. Install rope assemblies in accordance with manufacturer's instructions and the approved shop drawings.
- B. Provide anchorage devices and fittings to secure to in-place construction; including threaded fittings for concrete inserts, toggle bolts and through-bolts.

- C. Anchor rope assemblies to mounting surfaces as indicated on the drawings.
- D. Separate dissimilar materials with bushings, grommets or washers to prevent electrolytic corrosion.
- E. Use manufacturer's supplied mounting hardware.
- F. Terminate and tension cable system in accordance with manufacturer's instructions.
- G. Ensure ropes are clean, and without kinks or sags.
- H. After final adjustment provide tamper resistant locktight materials on all fittings.

3.05 CLEANING

- A. Remove temporary coverings and protection of adjacent work areas.
- B. Clean installed products in accordance with manufacturer's instructions before owner's acceptance. Do not use chlorine-based or abrasive cleaners.
- C. Remove from project site and legally dispose of construction debris associated with this work.

3.06 PROTECTION

- A. Protection: Protect installed product from damage during subsequent construction activities.

END OF SECTION