Department of Public Works
**Engineering Division**
Robert F. Phillips, P.E., City Engineer

City-County Building, Room 115
210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703
Phone: (608) 266-4751
Fax: (608) 264-9275
engineering@cityofmadison.com
www.cityofmadison.com/engineering

**Assistant City Engineer**
Gregory T. Fries, P.E.
Kathleen M. Cryan

**Principal Engineer 2**
Christopher J. Petykowski, P.E.
John S. Fahrney, P.E.

**Principal Engineer 1**
Christina M. Bachmann, P.E.
Eric L. Dundee, P.E.

**Facilities & Sustainability**
Jeanne E. Hoffman, Manager

**Mapping Section Manager**
Eric T. Pederson, P.S.

**Financial Manager**
Steven B. Danner-Rivers

December 12, 2017

**NOTICE OF ADDENDUM**
**ADDENDUM NO. 4**

**CONTRACT NO. 8027, PROJECT NO. 17451**
**MADISON FIRE STATION 14**

Revise and amend the contract document(s) for the above project as stated in this addendum, otherwise, the original document shall remain in effect.

This addendum consists of the following documents:

1. **GENERAL CONTRACT CONDITIONS**
   No Change

2. **GENERAL QUESTIONS AND ANSWERS**
   Q1: Is there a basis of design for ACT Ceiling tile?
   A1: Manufacturer: Armstrong
   Style: Ultima
   Color: White
   Edge Profile: Beveled Tegular
   Gird: 9/16”
   Size: 24” x 24”
   Application: As Scheduled

   Q2: Is there a basis of design for the Roller Finish Material?
   A2: Manufacturer: Lutron
   Style: Basketweave
   Openness Factor: 1%
   Color: Charcoal
   Note: Refer to RCP for locations with Double Roller with room darkening capabilities.

   Q3: There is a spec for corner guards but I don’t see where they are to be installed.
   A3: Provide corner guards at exposed outside corners with gypsum board finish – typ.
   Exception: Do not provide (2) corner guards for the art work display area. See elevation 9/A406.

   Q4: Can you provide additional info on the concrete polishing?

A4: Polishing criteria added to specification attached to this addendum.

Q5: Is there a basis of design for the glass wall on 11/A406?
A5: Interior Tempered Glass sized by manufacturer.
Recessed Track Manufacturer: C.R. Lawrence
Style: CRL 98" Brite Anodized U-Channel
Catalog Number: SDCF38BA
Finish: Brite Anodized

3. **SUBSTITUTION REQUESTS**
No Change

4. **SPECIFICATIONS**
**ADDED** 05 41 00 COLD FORMED STEEL FRAMING SYSTEM
(Cold Form Exterior Applications)

**MODIFIED** 03 35 11 CONCRETE FLOOR FINISHES to include polishing criteria

5. **DRAWINGS**
No Change

6. **PROPOSAL**
No Change

Please attach these Addendum documents to the Drawings and Project manual in your possession.

Please acknowledge this addendum on page E1 of the contract documents and/or in Section E: Bidder's Acknowledgement on Bid Express.

Electronic version of these documents can be found on the Bid Express web site at:

http://www.bidexpress.com

If you are unable to download plan revisions associated with the addendum, please contact the Engineering office at 608-266-4751 receive the material by another route.

Sincerely,

Robert F. Phillips, P.E., City Engineer

Cc: Greg Fries, Kathy Cryan

**SECTION 03 35 11**

**CONCRETE FLOOR FINISHES**

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Surface treatments for concrete floors and slabs.

### 1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

### 1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with concrete floor placement and concrete floor curing.

### 1.4 SUBMITTALS

A. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

B. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

### 1.5 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference at Project site.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, , and Owner's Representative of scheduled meeting dates.

### 1.6 QUALITY ASSURANCE

A. Polisher Qualifications:
   1. Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
   2. Manufacturer Qualification: Approved by manufacturer to apply liquid applied products.

### 1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

### 1.8 FIELD CONDITIONS

A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.

B. Do not finish floors until interior heating system is operational.

C. Maintain ambient temperature of 50 degrees F minimum.

## PART 2 PRODUCTS

### 2.1 DENSIFIERS AND HARDENERS

A. Liquid Densifier/Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set or as otherwise recommended by manufacturer.
   1. Composition: Lithium silicate.
   2. Products:
      a. ProSoCo; Consolideck LS.
      b. W.R. Meadows, Inc; Liqui-Hard Ultra: www.wrmeadows.com/sle.

**2.2 COATINGS**

A. Enhancing Sealer: High-gloss, enhancing sealer for hardened concrete.
   1. Products:
      a. ProSoCo; Consolideck LS Guard.
      b. W.R. Meadows, Inc.; Bellatrix.

**2.3 POLISHING EQUIPMENT**

A. Field Grinding and Polishing Equipment:
   1. Variable speed, multiple head, counter-rotating, walk-behind machine with not less than 600 pounds of down pressure on grinding or diamond polishing pads.
   2. If dry grinding, honing, or polishing, use dust extraction equipment with flow rate suitable for dust generated, with squeegee attachments.

B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produces same results, without noticeable differences, as field grinding and polishing equipment.

C. Burnishing Equipment: High speed walk-behind or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.

D. Metal Bonded Pads: Grinding pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.

E. Resin Bonded Pads: Polishing pads with embedded industrial grade diamonds of varying grits fabricated for mounting on equipment.

F. Burnishing Pads: Maintenance pads for use with high speed burnishing equipment.

**PART 3 EXECUTION**

04ADD

**3.1 EXAMINATION**

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

C. Starting work within a particular area will be construed as acceptance of surface conditions.

**3.2 PREPARATION**

A. Alkalinity:
   1. Test Method: Measure pH according to method indicated in ASTM F 710.
   2. Acceptable Results: pH between 8 and 10.

B. Moisture Vapor Transmission Rate:
   1. Test Method: Perform anhydrous calcium chloride test according to ASTM F 1869.
   2. Acceptable Results: Not more than 5 pounds per 1000 square feet in 24 hours.

C. Relative Humidity:
   1. Test Method: Perform relative humidity test using in situ probes according to ASTM F 2170.
   2. Acceptable Results: Not more than 75 percent.

**3.3 GENERAL**

A. Apply materials in accordance with manufacturer's instructions.

**3.4 COATING APPLICATION**

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion. Remove if present. Clean in accordance with concrete floor finish manufacturer's written instructions.

B. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

C. At concrete surfaces indicated to be sealed, but not polished, provide the following:
   1. Confirm that concrete slab is acceptable to concrete floor finish manufacturer for application of hardener. Apply hardener/densifier in accordance with manufacturer's instructions. Allow to dry per manufacturer's instructions prior to applying enhancing sealer.
   2. Apply two coats of enhancing sealer after hardener/densifier has dried per manufacturer's instructions.
   3. Once enhancing sealer is dry, brunish after each coat using a high speed burnisher in accordance with manufacturer's instructions.
   4. At Substantial Completion, apply and burnish two additional coats of enhancing sealer to all sealed floor areas.

04ADD

**3.5 CONCRETE POLISHING**

A. Execute using materials, equipment, and procedures specified by manufacturer, using manufacturer approved installer.

B. Initial Grinding:
   1. Use grinding equipment with metal bonded grinding pads.
   2. Begin grinding in one direction using sufficient size grit pad.
   3. Make sequential passes with each pass perpendicular to previous pass using finer grit pad with each pass, up to 150 grit.
   4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
   5. Vacuum floor using squeegee vacuum attachment after each pass.
   6. Continue grinding until aggregate exposure matches approved field mock-ups.

C. Treating Surface Imperfections:
   1. Mix patching compound and grout material with dust created by grinding operations to match color of adjacent concrete surface.
   2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids.
   3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.

D. Liquid Densifier Application: Apply undiluted to point of rejection, remove excess liquid, and allow to cure according to manufacturers instructions.

E. Polishing:
   1. Use polishing equipment with resin bonded polishing and burnishing pads.
   2. Begin polishing in one direction starting with 800 grit pad.
   3. Make sequential passes with each pass perpendicular to previous pass using finer grit pad with each pass, up to 1500 grit.
   4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
   5. Auto scrub or vacuum floor using squeegee vacuum attachment after each pass.
   6. Continue polishing until gloss appearance, as measured according to ASTM E 430, matches approved field mock-ups.

F. Final Polished Concrete Floor Finish:
   1. Fine Aggregate (Salt and Pepper) Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with no, or small amount of, medium aggregate at random locations.
   2. Apply one of the following polish levels to match approved field mock-up.
      a. Level C:
         1) Procedure: Not less than 6 steps with full refinement of each diamond pad up to 1500 grit resin bonded pad with one application of densifier.
         2) Gloss Reading: Not less than 60 according to ASTM E 430 before enhancing sealer application.

G. Enhancing Sealer Application: Apply after completion of polishing.
   1. Clean polished surfaces prior to application of enhancing sealer.
   2. Apply two coats of enhancing sealer in accordance with manufacturer's instructions.
   3. Once enhancing sealer is dry, brunish after each coat using a high speed burnisher in accordance with manufacturer's instructions.

**3.6 PROTECTION**

A. Cover floors with masonite during construction. Remove at Substantial Completion.

**3.7 FINAL APPLICATION**

A. At Substantial Completion, apply two coats of enhancing sealer to concrete surfaces receiving hardener/densifier.

**END OF SECTION**

# SECTION 05 40 00
# COLD-FORMED STEEL FRAMING (CFSF) SYSTEM

new section added 04ADD

## PART 1 - GENERAL

### 1.1 DESCRIPTION

A. The General and Supplementary Conditions of the Construction Contract and Division 1 - General Requirements apply to the work specified in this section.

B. Load bearing structural steel studs of 20 to 12 gauge (33 mil to 97 mil) members along with fasteners and related accessories.

C. Furnish and install cold-formed steel framing system as shown on Drawings and herein specified.

1. Work shall include, but not be limited to the following items:

a. Bearing and non-load bearing formed steel stud exterior wall.

b. Provide tracks, blocking, lintels, clips angles, bridging, shoes, reinforcements, fasteners and accessories to construct a complete steel framing system.

D. Structural notes indicated on Drawings regarding cold-formed steel framing system shall be considered a part of this Specification.

E. Refer to Division 9 for non-load bearing studs of 20 gauge (30 mil) or lighter.

### 1.2 QUALITY ASSURANCE

A. Workmen Qualifications:

1. For the actual erection of cold-formed steel framing system, use only skilled journeymen steel framing erectors who are thoroughly experienced with the materials and methods specified.

2. Use qualified welders and comply with AWS standards.

B. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. AISI - Specification for the Design of Cold Formed Steel Structural Members, Current Edition.

2. AISI General Provisions 2004 Edition.

3. AWCI - Association of Wall and Ceiling Industries, Current Edition.

4. AWS D1.3 - Structural Welding Code - Sheet Steel

5. ASTM A653 - Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot Dip Process.

6. ASTM A1008 -Structural Steel (SS), Sheet, Carbon, Cold-Rolled

7. ASTM C955 - Load Bearing (Transverse and Axial) Steel Studs, Runners (Track) and Bracing or Bridging for Screw Applications of Gypsum Board and Metal Plaster Base.

8. ASTM C1007 - Installation of Load Bearing Steel Studs and Related Accessories.

9. SSMA - Steel Stud Manufacturers Association.

C. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

D. Performance Requirement:

1. Provide CFSF capable of withstanding design loads indicated on the plans.

2. Design CFSF to withstand design loads meeting the following deflection limits:

a. Exterior walls backing up brick or stone veneer: Horizontal deflection of 1/600 of wall height.

b. Exterior walls cladded with metal siding, exterior insulated finish systems or other flexible non-brittle finishes: Horizontal deflection of 1/360 of wall height.

3. Design CFSF to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120°F.

4. Design system to accommodate construction tolerances, deflection of building structural members (1 inch maximum), and clearances of intended openings.

5. CFSF shall be designed in accordance with “Standard for Cold-Formed Steel Framing - General Provisions”, current edition.

## 1.3 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer’s approval, including framing plans indicating size, gauge, weight and location of all framing members. Shop drawings shall indicate the following:

a. Component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, bracing, bridging, strapping, connections, and accessories or items required of other related work. Provide stud layout.

b. Describe method for securing studs to tracks and for bolted/welded framing connections.

c. Provide calculations for loadings and stresses of steel framing system, including specially fabricated components and roof trusses, shall be prepared by a registered professional engineer, with registration from the state in which the building is located.

d. Detail size and location of all bridging, strapping, bracing, splices, and accessories required for installation.

B. Product Data:

1. Provide product data on standard framing members. Describe materials and finish, product criteria and limitations. Submit manufacturer's installation instructions.

## 1.4 QUALIFICATIONS

A. MANUFACTURER: Company specializing in performing the work of this section with a minimum of five (5) years documented experience at manufacturing cold-formed steel and framing systems and related accessories. Manufacturer shall be a current and “full” member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

B. All steel studs and track furnished under this section shall be supplier by a manufacturer who is a current member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

C. Steel studs, headers, and other elements used for this project are sized based on SSMA. Elements of equal or greater capacity may be exchanged.

D. Preparation of shop drawings, design calculations, and other structural data by a qualified Professional Engineer licensed in the State of Wisconsin.

**1.5 PRODUCT DELIVERY, STORAGE AND HANDLING**

A. Steel members shall be transported, stored and erected in a manner that will avoid any damage or deformation. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of ground and in such a manner so as to eliminate excessive handling.

## PART 2 - PRODUCTS

**2.1 MATERIALS**

A. Framing Materials:

1. Studs shall be minimum 20 gauge (33 mil) thick sheet steel conforming to ASTM A653 Grade 33 for 18 gauge and thinner and/or Grade 50 for 16 gauge and thicker, formed to channel shape, punched web, with nominal size as indicated on Drawings.

2. Track shall be minimum 20 gauge (33 mil) thick sheet steel, channel shaped, solid web, same width as above studs. Track shall provide a tight fit for studs.

B. Accessories:

1. Bracing, furring and bridging shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.

2. Plates, gussets and clips shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.

C. Fasteners:

1. Self-drilling, self-tapping screws, bolts nuts and washers shall conform to ASTM A90, complete with hot-dip galvanized.

2. Expansion anchors shall be "Kwik" bolts, as manufactured by Hilti, Inc.

3. All other fasteners shall be as indicated on Drawings or as recommended by the above stud manufacturer.

4. Welding connections are to be performed in accordance with American Welding Society (AWS) D1.3 latest edition “Specification for Welded Sheet Steel in Structures.” Consult AWS D19.0 latest edition “Welding Zinc Coated Sheet” and ANSI Standard Z49.1 for information regarding welding procedures.

D. Finishes:

1. Furnish all studs system components with a factory galvanized (G60) finish.

**2.2 FABRICATION**

A. Fabricate assemblies of framed sections, of sizes and profiles required with framing members fitted, reinforced and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to Worksite, ready for installation.

**PART 3 - EXECUTION**

**3.1 INSPECTION**

A. Verify that substrate surfaces and building framing components are ready to receive work.

B. Beginning of installation means acceptance of existing conditions and substrate.

**3.2 INSTALLATION**

A. General:

1. Cold-formed steel framing system shall consist of structural steel studs with locations as shown on Drawings. All work shall be in accordance with approved shop drawings and manufacturer's latest printed specifications. Framing members shall be securely attached by mechanical fasteners as indicated on Drawings and as recommended by the manufacturer.

    a. All field welding shall be in accordance with AWS previously cited.

    b. Wire tying of stud or components in system will not be allowed.

    c. Complete framing system ready to receive subsequent facing material.

2. Provision shall be made in studs for rigid fastening of all blocking and special braces or framing and for attachment and support of electrical outlets or other equipment indicated to be supported by stud construction.

    a. All anchorage, bracing and blocking shall be in accordance with approved shop drawings and as recommended by the manufacturer.

3. Surfaces abraded by handling, weld locations and other miscellaneous defects shall be touched-up with zinc-rich galvanizing compound (ZRC) coating.

B. Erection Of Studding:

1. Top and bottom runner members shall be the same size and gauge as the stud and be continuous for the total length of framing system or as long as practical and shall be securely attached a maximum of 24 inches on centers with approved fastening devices. Studs shall extend in one piece full height vertically between runners, spaced no greater than 24 inches on centers, with all web cut-outs in perfect alignment. Studs shall provide solid backing at corners and jambs. Install joists with all components property aligned and braced with all work plumb and true ready and acceptable to receive surface materials.

    a. Coordinate installation of sealant with floor and ceiling tracks.
    b. Field cutting of studs shall be done by sawing.
    c. Splices in axial load studs will not be permitted.
    d. Erect load bearing studs, brace and reinforce to develop full strength to meet design requirements.
    e. Extend stud framing through ceiling to underside of floor or roof structure above.

f. Install intermediate studs above and below openings with studs equally spaced to correspond to adjacent stud spacing.

g. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.

h. Framing fabricator shall ensure punchout alignment when assembling framing and field cutting to length.

i. All framing components shall be cut squarely for attachment to perpendicular members.

j. In the event a track butt joint occurs within a panel, abutting pieces of track shall be butt welded or spliced together. No such splices shall occur at any head or sill condition.

2. Steel studs shall be located not more than 2 inches from all door, abutting partitions, partition corners and other construction. Unless detailed otherwise, runner track or stud member shall be used as a runner over door frames. Structural studs and joists shall be securely and rigidly anchored in place to give a total and complete support to subsequent materials attached thereto. All studs shall be securely attached to jamb and head anchor clips of each door frame by manufacturer's recommended method.

a. Construct corners using minimum three studs. Jamb studs at doors, windows, and other wall openings shall be designed to resist the tributary load of the opening and meet specified performance requirements.

b. Cold-rolled steel channel stiffeners or bridging shall be provided and installed horizontally every 60 inches in all framing systems through stud web cut-outs with welding clips welded in place at each stud.

**END OF SECTION**