**SECTION 00003 – ADDENDUM NUMBER 3**

**DATE:** **January 6, 2015**

**TO:** **ALL BIDDERS**

**FROM:** **CLARK C. BURRITT, PRINCIPAL ARCHITECT**
**CITY OF WORCESTER**
**DEPARTMENT OF PUBLIC WORKS AND PARKS**
**50 SKYLINE DRIVE**
**WORCESTER, MA 01605**

**RE:** **REGIONAL EMERGENCY COMMUNICATIONS CENTER**
**2 COPPAGE DRIVE, WORCESTER, MA 01603**

**THIS ADDENDUM FORMS A PART OF THE CONTRACT AND MODIFIES THE ORIGINAL DOCUMENTS DATED DECEMBER 11, 2014.**

## PART 1 - GENERAL

**1.1** This addendum must be returned with plans and specifications (if not already returned) to have your deposit returned.

**1.2** This addendum modifies, amends, and supplements the Contract Documents for the above referenced project. This addendum is hereby made a part of the Contract Documents by reference and shall be as binding as though inserted in locations designated hereunder.

**1.3** Each general bidder shall be responsible for notifying all his non-filed sub-bidders and suppliers of the content of this addendum. No claim for additional compensation will be considered because of lack of knowledge of changes or modifications contained in this addenda.

**1.4** Questions or requests for clarification shall be in writing, addressed to Jeremy C. Flansburg at **DEPARTMENT OF PUBLIC WORKS AND PARKS**, **ARCHITECTURAL DIVISION,** and may be sent to fax number: (508) 799–8188. Please include your name, phone number, and fax number with your fax.

**1.5** Part 2 of this addendum indicates revisions to the Project Manual.

**1.6** Part 3 of this addendum indicates revisions to the Drawings.

**1.7** Part 4 of this addendum indicates clarification to Contractors Questions.

## PART 2 - SPECIFICATION

**2.1** **SPECIFICATION PROJECT MANUAL TITLE PAGE –** Delete "COOMUNICATIONS" and Insert "COMMUNICATIONS".

**2.2** **TABLE OF CONTENTS –** Delete the Table of Contents and insert new TABLE OF CONTENTS.

**2.3** **SECTION 00100 – INVITATION TO RE-BID –** Revised invitation to Re-Bid attached for the HVAC & Glazing Re-Bid.

**2.4** **SECTION 00500 – FORM OF SUB-RE-BID –** Revised forms attached for the HVAC & Glazing Re-Bid.

**2.5** **SPECIFICATION 014000 – QUALITY REQUIREMENTS,** 1.5 ADD new paragraph B as follows:

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

**2.6** **SPECIFICATION 024119 – SELECTIVE DEMOLITION- revise 1.8 G. 1. as follows; Existing transformer has been removed from the site, temporary power is able from a recently installed new transformer at the southeast corner of the site.**

**2.7** **SPECIFICATION 084126 ALL-GLASS ENTRANCES AND STOREFRONTS rename section to 084126 ALL-GLASS INTERIOR PARTITIONS.**

**2.8** **SPECIFICATION 088000 GLAZING; revise 1.3 SUMMARY paragraph A. 1. as follows; Glass for interior borrowed lites, glass for glazed curtain walls.**

**2.9** **SECTION 096900 – ACCESS FLOORING, Article 1.5 ACTION SUBMITTALS:**

Omit paragraph D. Delegated Design Submittal.

**2.10** **SECTION 096900 – ACCESS FLOORING, Article 2.1 PERFORMANCE REQUIREMENTS:**

Omit paragraph A. Delegated Design.

In paragraph B, strike the words "Engineer shall". This item remains the responsibility of the General Contractor as delegated to the access flooring subcontractor or supplier.

Replace paragraph F and subparagraphs with the following:

F. Structural Performance: Provide access-flooring systems capable of complying with the following performance requirements according to testing procedures in CISCA's "Recommended Test Procedures for Access Floors":

1. Design Load: A concentrated load of 1250 lbf with the following deflection and permanent set:

    a. Top-Surface Deflection: 0.10 inch.
    b. Permanent Set: 0.010 inch.

2. Ultimate Load: 2500 lbf, representing a minimum safety factor of 2 times the design load.
3. Rolling Loads: With local or overall deformation not to exceed 0.040 inch.

    a. CISCA Wheel 1: 10 passes at 1000 lbf.
    b. CISCA Wheel 2: 10,000 passes at 800 lbf.

4. Stringer Load Test: 450 lbf at center of span with a permanent set not to exceed 0.010 inch.
5. Pedestal Axial Load Test: 5000 lbf.
6. Pedestal Overturning Moment Test: 1000 lbf x inches.
7. Uniform Load Test: 400 lbf/sq. ft., with a maximum top-surface deflection not to exceed 0.040 inch and a permanent set not to exceed 0.010 inch.
8. Drop Impact Load Test: 150 lb.

## 2.11 SECTION 096900 – ACCESS FLOORING, Article 2.3 FLOOR PANELS:

Replace paragraph B and subparagraphs with the following:

B. Cementitious-Core Steel Panels: Fabricated from cold-rolled steel sheet, with the die-cut flat top sheet and die-formed and stiffened bottom pan welded together, and with metal surfaces protected against corrosion by manufacturer's standard factory-applied finish. Fully grout internal spaces of completed units with manufacturer's standard cementitious fill.

    1. Basis-of-Design Product: Subject to compliance with requirements, provide Tate Access Floors, Inc., ConCore 1250 access floor panel supported by PosiLock understructure system or a comparable panel system by one of the following or approved equal:

        a. ASM Modular Systems, Inc., FS Series.
        b. Camino Modular Systems, Inc., FS Series.

    2. Solid Panels: Flat, solid top surface, fabricated to receive one-to-one carpet tiles.

C. Perforated or Slotted Panels: Perforated top surface with holes or slots of number, spacing, and size standard with manufacturer to produce a minimum open area of 25 percent.

    a. Quantity: Twenty (20).
    b. Finish: Manufacturer's standard.

## 2.12 SECTION 096900 – ACCESS FLOORING, Article 2.5 FLOOR PANEL COVERINGS:

Replace paragraph A and subparagraphs with the following:

A. Carpet: Provide removable modular carpet finish designed to facilitate access to floor panels, where indicated in Room Finish Schedule.

1. Basis-of-Design: Tate Access Floors, Inc., PosiTile System static dissipative carpet:

   a. Julie Industries, Discovery ECO Series, StaticSmart Flooring, as selected by Architect from manufacturer's full range.

B. High-Pressure Plastic Laminate: Provide factory applied, NEMA LD 3, High-Wear type, Grade HDH; fabricated in one piece to cover each panel face with integral trim edging, where indicated in Room Finish Schedule.

1. Basis-of-Design: Tate Access Floors, Inc., antistatic high pressure laminate:

   a. Electrical Resistance: Average no less than 1 megohms and no more than 20,000 megohms when installed floor coverings are surface-to-ground tested according to ASTM F 150 with 100-V applied voltage.

   b. Formica Corp., Access Floor Tile, as selected by Architect from manufacturer's full range.

**2.13** **SPECIFICATION 096723 – RESINOUS FLOORING**, add new **SPECIFICATION 096723 – RESINOUS FLOORING**,.

**2.14** **SPECIFICATION 096816 – SHEET CARPETING,** add new **SPECIFICATION 096816 – SHEET CARPETING.**

**2.15** **SPECIFICATION SECTION 107516 GROUND SET FLAGPOLES,** add new**. SPECIFICATION SECTION 107516 GROUND SET FLAGPOLES**

**2.16** **SPECIFICATION 122413 – ROLLER WINDOW SHADES, add 2.1 MANUFACTURERS A1.4 "Rollease, Inc." as an approved equal.**

Bill Putnam Commercial Program Manager Rollease, Inc. 200 Harvard Avenue Stamford, CT 06902 800.552.5100 Ext. 113 Cell: 631.456.9670 bputnam@rollease.com www.rollease.com

**2.17** **SPECIFICATION SECTION 311000 SITE CLEARING, add new. SPECIFICATION SECTION 311000 SITE CLEARING.**

**2.18** **SPECIFICATION 323113 – CHAIN-LINK FENCES AND GATES,** add new **SPECIFICATION 323113- CHAIN – LINK FENCES AND GATES**

**2.19** **SPECIFICATION SECTION 230000 – HVAC, PAGE 2, #3 ADD:**

| Class of Work | Reference Specification | Paragraphs |
|---|---|---|
| Sheet Metal | | |
| Insulation (Pipe & Duct) | | |
| Controls | | |

| | | |
|---|---|---|
| Testing & Balancing | | |

## PART 3 - DRAWINGS

**3.1** SKETCHES

The following sketches (attached) revise or supplement currently issued drawings:

1. **SKA-01 INTERIOR WINDOW DETAILS-Revised 01/06/15**
2. **SKH-01 TELCO/ELEC RM A/C UNIT AND CONDENSER REVISIONS**
3. **ADD FLAGPOLE CUT SHEET TO DRAWING C6 DETAILS.**

## PART 4 - TABULATION OF FILED SUB-BIDS

**4.1 Notification of Filed Sub-Bids Received Tuesday, December 30th 2014.**

1. The General Bidders shall select one Sub-Bidder in each sub-bid class of work listed below and as indicated in the Invitation to Bid.
   a. Sub-Bids that are restricted by the Sub-Bidder to or from use by a General Bidder(s) are labeled accordingly.
2. General Bidders shall determine the fees, bond costs, etc. that are the General Contractor's responsibility, project requirements, schedule of work, etc., for each Sub-Bid used.
3. **NOTE FOR SECTION 2300000-HVAC & SECTION 088000 - GLAZING**

   A. All Filed Sub-Bids under section **230000-HVAC & 088000-GLAZING, have been REJECTED** by the owner pursuant to Massachusetts General Laws, Chapter 149, Section 44 (I). The City of Worcester is proceeding as provided in Massachusetts General Laws, Chapter 149, Section 44F, (4) (a) (2) to obtain new Bid Proposals

   B. All General Bidders shall carry in their Bid, under ITEM #2, the amount of one hundred thousand dollars ($100,000.00) for the work in of this Sub-Bid **SECTION 088000 – GLAZING** and the cost of a bond for this work; Said amount to be adjusted by the difference between the amount carried and the actual Sub-Bid amount once determined in accordance with Massachusetts General Laws, Chapter 149, Section 44F, (4) (a) (2).

   C. All General Bidders shall carry in their Bid, under ITEM #2, the amount of three hundred thousand dollars ($300,000.00) for the work in of this Sub-Bid **SECTION 230000 – HVAC** and the cost of a bond for this work; Said amount to be adjusted by the difference between the amount carried and the actual Sub-Bid amount once determined in accordance with Massachusetts General Laws, Chapter 149, Section 44F, (4) (a) (2).

D. Filed Sub-Bids for **SECTION 230000 HVAC & SECTION 088000 GLAZING**, will be received at the City of Worcester, Department of Public Works & Parks, 50 Skyline Drive, Worcester, MA 01605 no later than **11 A.M.** on **WEDNESDAY JANUARY 28th** and will be publicly opened thereafter and read aloud.

**4.2 FILED SUB-BIDS TABULATION; THE LISTING OF FILED SUB-BIDS RECEIVED IS AS FOLLOWS:**

**SEE THE FOLLOWING ATTACHED PAGE**

**SECTION 055000 – METAL FABRICATIONS**

| | | |
|---|---|---|
| **V & G IRONWORKS INC.**<br>**1500 Shawsheen Street**<br>**Tewksbury, MA 01056**<br>**413-589-9693** | | **BID PRICE:**<br>**$118,018.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **L & L CONTRACTING, INC**<br>**25 Hayward Street Rear**<br>**Braintree, MA 02184**<br>**(781) 849-0770** | | **BID PRICE:**<br>**$173,600.00**<br>**Alternate #1 - $5,500.00**<br>**Alternate #2 - $5,500.00** |
| **SMJ METAL COMPANY, INC.**<br>**36 Smith Street**<br>**Northampton, MA 01060**<br>**(413) 586-3535** | | **BID PRICE:**<br>**$243,000.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

**SECTION 071113– WATERPROOFING, DAMPROOFING & CAULKING**

| | | |
|---|---|---|
| **CHAPMAN WATERPROOFING COMPANY**<br>**395 Columbia Road**<br>**Boston, MA 02125**<br>**617-288-3000** | Restricted From:<br>G & R Construction<br>TLT | **BID PRICE:**<br>**$36,100.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **FOLAN WATERPROOFING &**<br>**CONSTRUCTION CO., INC.**<br>**795 Washington Street**<br>**South Easton, MA 02375**<br>**(508) 238-6550** | | **BID PRICE:**<br>**$45,000.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **ARMANI RESTORATION INC.**<br>**191 Franklin Avenue**<br>**Hartford, CT 06114**<br>**860-296-6811** | | **BID PRICE:**<br>**REJECTED**<br>**NON-RESPONSIVE** |

| | | |
|---|---|---|
| **ACME WATERPROOFING CO., INC.**<br>**21 Nightingale Avenue**<br>**Quincy, MA 02169**<br>**781-982-2250** | | **BID PRICE:**<br>**$60,978.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

**SECTION 095113 – ACOUSTICAL CEILING TILES**

| | | |
|---|---|---|
| **CENTRAL CEILINGS, INC.**<br>**36 Norfolk Avenue**<br>**South Easton, MA 02375**<br>**508-238-6985** | Restricted From:<br>G & R Construction | **BID PRICE:**<br>**$16,700.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **ACOUSTEK, INC**<br>**20 Ventura Drive**<br>**Dartmouth, MA 02747**<br>**(508) 995-9563** | | **BID PRICE:**<br>**$23,500.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

**SECTION 099123 – INTERIOR PAINTING**

| | | |
|---|---|---|
| **JOHN W. EGAN CO, INC.**<br>**P.O. Box 600070**<br>**3 Border Street**<br>**Newtonville, MA 02460**<br>**(617) 244 - 6390** | | **BID PRICE:**<br>**$39,200.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **KELTIC PAINTNG, LLC**<br>**189 Hill Road**<br>**Thompson, CT 06277**<br>**(860) 963-7812** | | **BID PRICE:**<br>**$43,400.00**<br>**Alternate #1 - $350.00**<br>**Alternate #2 - $8,400.00** |
| **KING PAINTING INC.**<br>**85 Flagship Dr. Suite K**<br>**North Andover, MA 01845**<br>**978-683-7434** | | **BID PRICE:**<br>**$44,600.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $6,500.00** |
| **DANDIS CONTRACTING, INC.**<br>**1020 Turnpike Street**<br>**Canton, MA 02021**<br>**781-828-9313** | | **BID PRICE:**<br>**$46,800.00**<br>**Alternate #1 - $300.00**<br>**Alternate #2 - $4,000.00** |
| **R.J. FORBES PAINTING CONTRACTOR, INC.**<br>**228 O'Neil Blvd.**<br>**Attleboro, MA 02703**<br>**508-226-4858** | Restricted From:<br>G & R Construction | **BID PRICE:**<br>**$54,918.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

| | | |
|---|---|---|
| **DRIZOS CONTRACTING, LLC**<br>**101 Middlesex Turnpike**<br>**STE 6 # 353**<br>**Burlington, MA 01803**<br>**978-460-2241** | | **BID PRICE:**<br>**$80,800.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $14,200.00** |
| **BELLO PAINTING CO. INC.**<br>**585 East Street**<br>**Weymouth, MA 02189**<br>**781-331-5600** | | **BID PRICE:**<br>**$81,000.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $63,000.00** |

**SECTION 210000 – FIRE PROTECTION**

| | | |
|---|---|---|
| **COGSWELL SPRINKLER CO, INC.**<br>**22 Canterbury Street**<br>**Worcester, MA 01610**<br>**(508) 753-0015** | | **BID PRICE:**<br>**$341,790.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **CARLYSLE ENGINEERING, INC.**<br>**132 Brookside Avenue**<br>**Boston, MA 02130**<br>**(617) 522-6650** | | **BID PRICE:**<br>**$347,290.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **YANKEE SPRINKLER CO., INC.**<br>**612 Plymouth Street**<br>**E. Bridgewater, MA 02333**<br>**(508) 378-7212** | | **BID PRICE:**<br>**$374,000.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

**SECTION 220000 - PLUMBING**

| | | |
|---|---|---|
| **ROBERT W. IRVINE & SONS, INC.**<br>**147 Blossom Street**<br>**Lynn, MA 01902**<br>**(781) 581-0464** | | **BID PRICE:**<br>**$128,880.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **ARAUJO BROS. PLUMBING & HEATING**<br>**244 Nyes Lane**<br>**Achusnet, MA 02743**<br>**(508) 998-7006** | | **BID PRICE:**<br>**$139,000.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |

**SECTION 260000 – ELECTRICAL**

| | | |
|---|---|---|
| **WAYNE J. GRIFFIN ELECTRIC, INC.**<br>**116 Hopping Brook Road**<br>**Holliston, MA 01746**<br>**508-429-9102** | | **BID PRICE:**<br>**$787,900.00**<br>**Alternate #1 - $905.00**<br>**Alternate #2 - $5,029.00** |

| | | |
|---|---|---|
| **SYSTEMS CONTRACTING, INC.**<br>**7 Scobee Circle**<br>**Plymouth, MA 02360**<br>**508-746-7000** | | **BID PRICE:**<br>**$818,000.00**<br>**Alternate #1 - $42,000.00**<br>**Alternate #2 - $0.00** |
| **M-V ELECTRICAL CONTRACTORS INC.**<br>**10 Conduit St**<br>**Achunet, MA 02743**<br>**508-995-3826** | Restricted From:<br>Commercial Construction<br>Roger A Tremblay Contractors<br>General Air Conditioning & Heating | **BID PRICE:**<br>**$846,800.00**<br>**Alternate #1 - $38,800.00**<br>**Alternate #2 - $0.00** |
| **DMH ELECTRIC, INC.**<br>**29 Legate Hill Road, Unit A**<br>**Sterling, MA 01564-2369**<br>**978-422-0400** | | **BID PRICE:**<br>**$888,700.00**<br>**Alternate #1 - $24,000.00**<br>**Alternate #2 - $0.00** |
| **OSTROW ELECTRIC CO., INC.**<br>**9 Mason Street**<br>**Worcester, MA 01609**<br>**508-754-2641** | | **BID PRICE:**<br>**$913,000.00**<br>**Alternate #1 - $28,000.00**<br>**Alternate #2 - $6,600.00** |
| **ANNESE ELECTRICAL SERVICES INC.**<br>**280 Libbey Industrial Parkway**<br>**Weymouth, MA 02189**<br>**781-337-6462** | | **BID PRICE:**<br>**$922,800.00**<br>**Alternate #1 - $2000.00**<br>**Alternate #2 - $0.00** |
| **BRITE-LITE ELECTRICAL CO., INC.**<br>**11 Front St.**<br>**Weymouth, MA 02188**<br>**781-340-9102** | Restricted From:<br>GVW<br>TLT | **BID PRICE:**<br>**$1,149,949.00**<br>**Alternate #1 - $0.00**<br>**Alternate #2 - $0.00** |
| **DAGLE ELECTRICAL CONSTRUCTION CORP.**<br>**285 Salem Street**<br>**Woburn, MA 01801**<br>**781-937-7676** | Restricted To:<br>Dagle Electrical Construction Corp. | **BID PRICE:**<br>**$1,248,248.00**<br>**Alternate #1 - $54,000.00**<br>**Alternate #2 - $12,000.00** |

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## PART 5 - CONTRACTOR QUESTIONS

**5.1** QUESTION: In section 09500 on page 14-15 it notes the liquidated damages for GC and subs for WBE/MBE non-compliance as 1/10 of 1% of the contract award price. Is this fee charged per week or only once for the GC?
ANSWER: ***Spec section 00950, page 15, a clearly says per week.***

**5.2** QUESTION:. Since we are utilizing the existing slab on grade is it necessary to provide the services of a land surveyor per section 010500-1?
ANSWER: ***The drainage structures, outlet pipes, and the metal storage structure will need horizontal and vertical control to place.***

**5.3** QUESTION:. In section 015000-6 it notes many of the temporary electrical items including permit, misc equipment, wiring, lighting, etc is by the GC. Typically these items are all by the Filed Sub Bid Electrical contractor. Please verify which items are to be by the GC and which ones should be carried in the Electrical Filed Sub Bidders price.

ANSWER: ***Spec section 015000 clearly says what the gc is responsible for and what the filed sub electrician is responsible for bid.***

**5.4** QUESTION: Could you please confirm that if alternate #1 for the site work is accepted, is the trailer storage area going to be also paved?

ANSWER: ***Yes***

**5.5** QUESTION: Regarding question 4.1 & 4.2 on Addendum #1 is section 071416 responsible for supplying the insulation, drainage board & parging finish system or are these items to be supplied by the GC & installed by 071416?

ANSWER: ***These items are to be supplied by Section 071416.***

**5.6** QUESTION: Regarding question 4.7 on Addendum #1 is the GC responsible for hiring Siemens or is the owner hiring them outside of this contract?

ANSWER: ***The owner will hire***.

**5.7** QUESTION: In the original Owner-Contractor Agreement there was an incentive of $35,000 to finish the project early. Will there be a similar incentive added to the revised Owner-Contractor Agreement in Addendum #1?

ANSWER: ***No, utilize 006000 issued in addenda #1***

**5.8** QUESTION: In the contents it list the following section, however it is not included in the actual specifications
096723 Resinous Flooring

ANSWER: ***See the attached specification in this addendum.***

**5.9** QUESTION: In review of the provided plans and specifications for this project, we notice that there are no structural drawings for this project. Addendum #1 also indicates that there will be no structural drawings. Who will be designing the direct connection between the helical piles to the columns? Is the design team trying to place one helical pile at each proposed new column location that are showing working loads of up to 135 kips? Typical pile capacities of no more than 50 kips per helical pile are generally used. With bedrock refusal at a depth of around 19 to 24 feet of which a helical pile will not screw into this type of soil stratum. It is also difficult to even get helical piles to screw

into very hard glacial till. Our preliminary analysis shows that a practical helical pile lead configuration will only achieve about 20 kips in compression before reaching the bedrock. Could the design team provide guidance on how to design the helical piles to support the high loads before hitting bedrock? How will the top of the helical pile be braced against possible eccentric loading if the helical pile is not perfectly placed at the centerline of the proposed columns? Helical piles screw into the soil and generally have the worst pile accuracy for being installed at their planned location. Generally having a helical pile within a couple inches of its planned location is acceptable. With the presence of cobbles found within the test pits it is very likely that the helical piles will move laterally as they are installed to work their way around the cobbles. This will create a large eccentric load on the top of the helical piles that are not designed to resist that type of force.

ANSWER: ***Steel Helical Pile Subcontractor shall furnish and install adequate sizes and/or number of piles to support the superimposed load indicated at each of the column locations on Drawing A 1.0. He shall design a pile cap at each column location to transfer load from column to pile(s). For design purposes, it shall be presumed that column base plates are no smaller than 10 inches square. Bottom of pile caps shall be no less than 6 inches below top of pile(s) at each column location. Top of pile caps shall be at existing floor grade. Pile caps shall extend 6 inches beyond edge of pile or piles at each column location. All pile caps shall be fully reinforced. Anchor bolts shall be provided by Metal Fabrications and installed by General Contractor.***

**5.10** The door schedule comments indicate “provide FOB controlled access” on a number of doors. Finish Hardware 087100 released in Addendum 2 calls for electrified hardware to be furnished as part of this section. The section has vague references to electrified exit devices and power supplies. There are no references to electrified locks or what type of fob reader that is required. There are too many types of readers to guess what they may be looking for.

ANSWER ***The Seimens fob system devices shall be furnished by the owner and installed by the contractor***

**5.11** The locker spec (105113 2.3 B. 7.) calls for 12” x 12” x 60” single tier lockers. Details 24, 25, 26 & 27 on sheet A6.3 show double tier lockers.

ANSWER:***Provide double tier lockers.***

**5.12** For the Worcester Regional Emergency Communication Center project, could you please let me know if there is any signage on this project?

ANSWER: ***No, Shall be provided by owner.***

**END OF ADDENDUM NUMBER 3**

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### DIVISION 2 – SITEWORK


| | |
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| SECTION 024119 | SELECTIVE DEMOLITION |


### DIVISION 3 – CONCRETE


| | |
|---|---|
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| SECTION 033543 | POLISHED CONCRETE FINISHING |


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**DIVISION 5 – METALS**

*** SECTION 055000 METAL FABRICATIONS

**DIVISION 6 – WOOD AND PLASTICS**

SECTION 061053 MISCELLANEOUS CARPENTRY

**DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

*** SECTION 071416 COLD FLUID-APPLIED WATERPROOFING

**DIVISION 8 – DOORS AND WINDOWS**

SECTION 081213 HOLLOW METAL FRAMES
SECTION 081416 FLUSH WOOD DOORS
*** SECTION 084126 ALL-GLASS INTERIOR PARTITIONS (part of Section 088000-Glazing filed sub-bid)
SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS
SECTION 087100 DOOR HARDWARE
*** SECTION 088000 GLAZING
*** SECTION 088300 MIRRORS (part of Section 088000-Glazing filed sub-bid)

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*** SECTION 095113 ACOUSTICAL PANEL CEILINGS
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***** INDICATES SECTIONS THAT ARE FILED SUB-BID SECTIONS**

CITY OF WORCESTER
INVITATION TO RE-BID / NOTICE TO CONTRACTORS
**REGIONAL EMERGENCY COMMUNICATIONS CENTER**
**2 COPPAGE DRIVE**
Worcester, Massachusetts 01603

The City of Worcester, the Awarding Authority, invites sealed re-bids for: **REGIONAL EMERGENCY COMMUNICATIONS CENTER, 2 Coppage Drive, Worcester, Massachusetts 01603** in accordance with documents prepared by Clark C. Burritt, Principal Architect, Department of Public Works & Parks, Architectural Services Division, 50 Skyline Drive, Worcester, MA 01605.

The project scope generally includes construction of steel building and interior buildout consisting of plumbing, HVAC, fire protection and electrical and any other related work

**SEALED FILED SUB-RE-BIDS** for **REGIONAL EMERGENCY COMMUNICATIONS CENTER** will be received at the Department of Public Works and Parks, Architectural Services Division, 50 Skyline Drive, Worcester, MA 01605 no later than 11:00 a.m., Wednesday, January 28, 2015 and will be publicly opened thereafter and read aloud.

Filed Sub-Bids required are as follows:

(1) Section 088000 GLASS AND GLAZING
(2) Section 230000 HVAC

**SUB-RE-BIDS must be** accompanied by:

(1) A fully executed FORM FOR SUB-BID;
**Specification Section 00500**.
(2) Certification of Payment of Massachusetts State Taxes Form;
**Specification Section 00850**.
(3) **Affidavit of Acknowledgment and Certificate of Compliance** for the City of Worcester Minority/Women Business Enterprise & Worker Utilization. **M/WBEP-Form EOO-101;**
**Specification Section 00900.**
(4) **Initial Statement and Certification of Compliance** with the Responsible Employer Ordinance**,**
**Form REO-101 page 2**, **Specification Section 00950**.
(5) **Provide Evidence** of Compliance with the Responsible Employer Ordinance **(REO)**. **As per Specification Section 00950.**
(6) **A Certificate of Eligibility** certifying the bidders qualification, in the respective filed sub trade category being bid, issued by the Division of Capital Asset Management, DCAM (formerly the Division of Capital Planning and Operations, DCPO), showing that the Bidder has been approved to bid on projects the size and nature of this project. In order to be eligible to be awarded this contract, a bidder must be certified in the appropriate category and for the total Cost of the respective work including all alternates elected (if applicable) to be taken by the Owner.

(7) **A Contractor Update Statement**, DCPO FORM CQ3. It is the Bidder's responsibility to obtain the necessary forms and make application to DCAM (DCPO) in sufficient time for DCAM (DCPO) to evaluate the application and issue a Certificate of Eligibility. A sample of the **Contractor Update Statement**, DCAM FORM CQ3 (revised December, 1999) is located at the end of Section 00150.

(8) Bid deposit for the sub-bid in the amount of **five (5) percent** of the value of the bid, or a bid bond.

(9) **Foreign Corporation Certificate of Registration** from the Commonwealth of Massachusetts State Secretary (if applicable).

**Plans and Specifications** will be available Wednesday, January 14, 2015 at the Department of Public Works and Parks, Architectural Services, 50 Skyline Drive, Worcester, MA 01605, Phone: (508) 799-8588, Fax: (508) 799-8188. Plans and specifications are also available at http://bids.worcesterma.gov/.

(1) A **refundable** plan **deposit** in the form of a company check (cash not accepted), without date restrictions, payable to "City of Worcester" in the amount of $50.00 per set for up to three (3) sets is required. If additional sets are required, a separate non-refundable check in the amount of $50.00 per set is required. Deposits for up to three (3) sets shall be returned to the bidders who return the complete sets, including any addenda issued, in good condition to the Department of Public Works and Parks, Architectural Services, 50 Skyline Drive, Worcester, MA 01605 within thirty (30) days after the bid opening.

(2) If **plans** and **specifications** are requested to be mailed, a separate non-refundable shipping and handling/mailing fee in the form of a company check payable to "City of Worcester" in the amount of $50.00 is required per set.

(3) A "Contractor's Plans and Specifications Request Form" is required to be filled out to obtain **plans** and **specifications** via the Architectural Services Division. Forms are available at the Department of Public Works and Parks, Architectural Services, 50 Skyline Drive, Worcester, MA 01605, Phone: (508) 799-8588, Fax: (508) 799-8188.

(a) After receipt of Contractor's Plans and Specifications Request Form, deposit and mailing fee, plans and specifications will be shipped via UPS.

(4) PARTIAL SETS **WILL NOT** BE ISSUED OR MAILED.

Contract Documents may be viewed, but not removed, at the following locations:

Architectural Services
Department of Public Works and Parks
50 Skyline Drive
Worcester, MA 01605

**WAGE RATES** - Bids are subject to the provisions of M.G.L., Chapter 149, Section 44A to J inclusive, as amended to date, and such other Federal, State and Municipal laws or regulations.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and to the fact that not less than the minimum wage rates set forth in the Contract Documents

shall be paid on this project. Minimum wage rates are per M.G.L., Chapter 149, Sections 26 & 27 inclusive.

**MINORITY/WOMEN BUSINESS ENTERPRISE PROGRAM** - The City of Worcester has established goals for the participation of minorities and women workers, contractors, subcontractors, and suppliers on all City projects. Bids must demonstrate the contractor's ability to utilize minorities and women in all phases of this project. The City of Worcester has established a program to enhance contract opportunities to minority and women-owned businesses through its Minority/Women Business Enterprise Program. This program contains minimum participation goals of ten (10) percent by MBE's and five (5) percent by WBE's calculated as a percentage of the total bid price. Accordingly, all general bidders and filed sub-bidders must execute and submit with their respective bids M/WBEP **Form EOO-101**, Contractor's and Filed Subcontractor's Certification.

**RESPONSIBLE EMPLOYER ORDINANCE** - The performance of the work derived from this bid is subject to the City's Responsible Employer Ordinance, Chapter 2, Section 35 of WRO (2008). Accordingly, all general bidders and filed sub-bidders must execute and submit with their respective bids **Form REO-101 page 2**, Contractor's and Filed Subcontractor's Initial Certification.

NOISE ORDINANCE **– All Contractors must adhere to the provision of § 1A(e)(9) of chapter nine of the Revised Ordinances of the city by limiting their on-site, noise producing construction and related work to the hours specified by said ordinance.**

**PRE-BID CONFERENCE** - The pre-bid conference will be held on Friday, January 23, 2015 at the project site, 2 Coppage Drive, Worcester, 01603 beginning at 10:00 a.m. with a brief overview and tour of the construction areas. It is recommended that all Bidders attend this meeting.

**WORK UNDER SEPARATE CONTRACTS AND BY OWNER** – The Owner may do other work during construction with its own forces or by separate contract.

**COMMENCEMENT OF WORK AND TIME OF COMPLETION** – The selected General Bidder must agree to commence work within five (5) days of the execution of a General Contract and to substantially complete on October 13, 2015 in accordance with the project schedule set forth in the contract documents.

The Awarding Authority reserves the right to waive any informality in, or to reject any or all general bids, if it were in the public interest to do so. In inviting sub-bids in connection with such a contract, the Awarding Authority shall reserve the right to reject any sub-bid on any sub-trade, if it determines that such sub-bid does not represent the sub-bid of a person competent to perform the work as specified, or that less than three (3) such sub-bids were received and that the prices are not reasonable for acceptance without further competition.

The City of Worcester is an equal opportunity/affirmative action employer.

City of Worcester, Massachusetts
Executive Office of the City Manager

**END OF DOCUMENT**

**CITY OF WORCESTER**

**FORM FOR SUB—RE-BID**

**SUB-TRADE:** _____

**NAME OF SUB-BIDDER:** _____

This bid must be accompanied by a bid deposit in the form of cash, or a bid bond, or a certified check, treasurer's check, or cashier's check, payable to the City of Worcester (hereinafter referred to as the "Owner" or the "Awarding Authority") in the amount of five (5) percent of the value of the bid. No other form of bid security will be accepted.

By submitting this bid the undersigned represents to the Owner that it has examined and understands the Advertisement for Bids, Instructions to Bidders, Contract Forms, Conditions of the Contract (General and Supplementary), Drawings, Specifications and all other Contract Documents and has examined the site, as defined therein, and that this bid is made with distinct reference and relation to all said Contract Documents, but the undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials needed, this bid is based solely on its own investigation and research and not in reliance upon any drawings, surveys, measurements, dimensions, calculations, estimates, or other tests or representations of any employee, officer, agent or consultant of the Owner. By submitting this bid, the undersigned agrees that it shall be subject to the jurisdiction of the courts of the Commonwealth of Massachusetts with respect to any actions arising out of or relating to this bid or any contract that may be entered into based upon this bid, and that any such actions commenced by the undersigned shall be commenced in the courts of the Commonwealth of Massachusetts.

A bidder wishing to amend this bid after transmittal to the Owner may do so only by withdrawing this bid and resubmitting another bid prior to the time for opening bids. See: General Bid Form

To all General Bidders except those excluded:

A. The undersigned proposes to furnish all labor and materials required for completing the Work specified in Section(s) _____ of the Specifications for the Regional Emergency Communications Center, 2 Coppage Drive, Worcester, Massachusetts 01603, in accordance with the accompanying Drawings, Specifications and Addenda, prepared by Clark C. Burritt, Principal Architect, Department of Public Works & Parks, Architectural Services Division, 50 Skyline Drive, Worcester, MA 01605, for the contract price specified below, subject to additions or deductions according to the terms of the Plans and Specifications.

B. This Bid includes Addenda numbered _____.

C. The Proposed Contract Price is:

_____Dollars ($_____)

Alternates (refer to Section 012300, Alternates for a complete description of alternates):

Alternate Number 1: State the amount to be ADDED for All Site Work as currently planned.

$_____

Alternate Number 2: State the amount to be ADDED for the Covered Trailer Storage Building.

$_____

Unit Prices

C. Unit Prices (refer to Section 012200, Unit Prices for a complete description of Unit Prices):

1. Carry in the Base Bid a quantity of (31) 50 KIP piles/pile caps plates and extensions (Pile at exterior wall).

$_____ per pile/pile cap plate and extensions (add or deduct).

2. Carry in the Base Bid a quantity of (21) 50 KIP piles/pile caps plates and extensions (Pile at interior column).

$_____ per pile/pile cap plate and extensions (add or deduct)

D. To restrict General Bidders, insert "**X**" on one option only and fill in blanks following that selection. If no General Bidders are excluded disregard this item.

_____ **"RESTRICTED FROM"** – This Sub-bid may be used by any General Bidder except:

_____

_____

_____

_____ **"RESTRICTED TO"** – This Sub-bid may be used only by the following General Bidders:

_____

_____

_____

E. The names of all persons, firms and corporations furnishing to the undersigned labor or labor and materials for the class or classes or part thereof of work for which the provisions of the section of the specifications for this sub-trade require a listing in this

paragraph, including the undersigned, if customarily furnished by persons on his own payroll and in the absence of a contrary provisions in the specifications, the name of each such class of work or part thereto and the bid price for such class of work or part thereof are:

| NAME | CLASS OF WORK | BID PRICE |
|---|---|---|
| | | |
| | | |

(Do not give bid price for any class or part thereof furnished by undersigned.)

F. The undersigned agrees that, if he is selected as a sub-bidder, he will, within five (5) days, Saturdays, Sundays and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such General Bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the general contract, and, if requested so to do in the general bid by such general bidder, who shall pay the premiums therefore, furnish a performance and payment bond of a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the awarding authority, in the full sum of the subcontract price.

G. The undersigned agrees that the above list of bids to the undersigned represents bona-fide bids based on the hereinbefore described drawings, specifications and addenda and that, if the undersigned is awarded the contract, they will be used for the work indicated at the amounts stated, if satisfactory to the Awarding Authority.

H. The undersigned further agrees to be bound to the General Contractor by the terms of the hereinbefore-described drawings, specifications, including all general conditions stated therein, and addenda, and to assume toward him all the obligations and responsibilities that he, by those documents, assumes toward the Owner.

I. The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all requirements of the drawings and specifications:

1. The undersigned has been in the present business name _____ years.

2. Has the undersigned ever failed to complete any work awarded? _____

3. Provide a Bank Reference: _____

4. List one or more recent project with names of the General Contractor and Architect on which you served as a Subcontractor for work of similar character as required for the above-named project.

| PROJECT NAME | GENERAL | ARCHITECT | AMOUNT OF |
|---|---|---|---|

| | CONTRACTOR | | CONTRACT |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

J. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that he will comply fully with all laws and regulations applicable to awards made subject to Section 44A of Chapter 149 of the Massachusetts General Laws.

K. The undersigned further certifies under penalties of perjury that this bid is in all respects bona-fide, fair and made without collusion or fraud with any other person. As used herein the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of Section Twenty-nine F of Chapter Twenty-nine, or any other applicable debarment provisions of any other Chapter of the Massachusetts General Laws or any rule or regulation promulgated there under.

L. The undersigned hereby certifies that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that they will comply fully with all laws and regulations applicable to awards made subject to M.G.L. c.149 sec.44A-J.

| | |
|---|---|
| Date | Print Name of Bidder |
| Social Security Number or Federal Identification Number | By _____ Name of Person Signing Bid and Title |
| Telephone Number | Business Street Address |
| Fax Number | City, State and ZIP Code |

M. The Bidder shall fill in the following information about its business organization.

3. If the Bidder is a Corporation, indicate the state of incorporation.

| | |
|---|---|
| President: | State of Incorporation: |
| Treasurer: | Secretary: |
| If a Foreign Corporation: (incorporated or organized under laws other than laws of the Commonwealth of Massachusetts) | Is the Corporation registered with the Secretary of State of Massachusetts?<br>Yes _____ No _____ |
| If the Bidder is selected for the work referred to above, it is required under Massachusetts General Laws, Chapter 30, Section 39L to furnish to the Awarding Authority a certificate of the Secretary of State stating that the Corporation has complied with Massachusetts General Laws, Chapter 181, Sections 3 and 5 and the date of such compliance. | |

4. If the Bidder is a Partnership, give full names and addresses of all partners:

| | |
|---|---|
| Name of Partner: | Residence Address: |
| Name of Partner: | Residence Address: |
| Name of Partner: | Residence Address: |
| Name of Partner: | Residence Address: |

5. If the Bidder is an Individual, give residential address if different from business address:

| | |
|---|---|
| Name: | Residence Address: |

6. If the Bidder is an Individual doing business under a Firm name:

| | |
|---|---|
| Name of Firm: | Business Address: |
| Name of Individual: | Residence Address: |

7. Other form of business organization:

| |
|---|
| |
| |

| |
|---|
| |

N. The Bidder will give below the name and address of the Surety Company who will sign the bonds.

| Name: | Address: |
|---|---|
| | |

**END OF SECTION 005000**

# SECTION 096723 - RESINOUS FLOORING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section includes resinous flooring systems.

### 1.3 SYSTEM DESCRIPTION

A. The work shall consist of preparation of the substrate, the furnishing and application of a cementitious epoxy based self-leveling seamless flooring system with decorative aggregate broadcast and epoxy broadcast and topcoats.

B. The system shall have the color and texture as selected by the Owner with a nominal thickness of 1/4 inch. It shall be applied to the prepared areas as defined in the plans strictly in accordance with the Manufacturer's recommendations.

### 1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Include Applicator, General Contractor and Architect.

### 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Sustainable Design Submittals:

1. Laboratory Test Reports: For flooring products, indicating compliance with requirements for low-emitting materials.

C. Samples for Initial Selection: For each type of exposed finish required.

D. Samples for Verification: For each resinous flooring system required, 6 inches square, applied to a rigid backing by Installer for this Project.

1.6 INFORMATIONAL SUBMITTALS

A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

B. Material Certificates: For each resinous flooring component, from manufacturer.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. The Manufacturer shall have a minimum of 5 years experience in the production, sales, and technical support of cementitious urethane, polyurethane industrial flooring and related materials.

B. The Applicator shall be approved by the flooring system manufacturer in all phases of surface preparation and application of the product specified.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Apply full-thickness mockups on 96-inch-square floor area selected by Architect.

a. Include 96-inch length of integral cove base with inside and outside corner.

2. Simulate finished lighting conditions for Architect's review of mockups.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name, product type and batch number and directions for storage and mixing with other components.

B. Storage and Protection:

1. Provide a dry storage area for all components. The area shall be between 60 F and 85 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
2. Keep copies of Material Safety Data Sheets (MSDS) for all components on site, available for reference.
3. Provide adequate disposal facilities for non-hazardous waste generated during installation of the system.

1.11 PROJECT CONDITIONS

A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.

B. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

1.12 WARRANTY

A. Manufacturer’s Warranty: The manufacturer shall warrant that their products will be free from manufacturing defects for a period of at least one (1) year from the date of purchase when installed in accordance with the manufacturer’s written specifications.

B. Installer’s Warranty: The contractor agrees to repair or replace components of their work that fail in materials or workmanship within five (5) years of substantial completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

A. Flooring products shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. System shall be in compliance with requirements of United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.

C. Flammability: Self-extinguishing according to ASTM D 635.

D. Critical Radiant Flux: 0.45 W/sq. cm or greater per NFPA 253.

E. Resistance to Elevated Temperature: No slip or flow of more than 1/16 inch per MIL-D-3134.

## 2.2 MANUFACTURERS

A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

B. Basis-of-Design Product: Subject to compliance with requirements, provide Dur-A-Flex, Inc, Dur-A-Chip, epoxy-based seamless flooring system.

1. System Materials:

   a. Primer: Dur-A-Glaze # 4 WB resin and hardener.
   b. First Broadcast Coat: Dur-A-Gard OPF resin and hardener.
   c. Second Broadcast and Grout Coat: Dur-A-Glaze #4 resin and Water Clear hardener.
   d. Chips: Micro Decorative Colored Chips. One color system shall be selected for this project.
   e. Topcoat: Poly-Thane #2 High Solids resin and hardener.

2. Patch Materials:

   a. Shallow Fill and Patching: Dur-A-Glaze # 4 Cove-Rez.
   b. Deep Fill and Sloping Material (over ¼ inch): Dur-A-Crete.

C. Other manufacturers offering epoxy-based seamless flooring systems include:

1. Epoxy Systems, Inc.
2. PolySpec.
3. Stonhard, Inc.
4. Tnemec Company, Inc.

## 2.3 PRODUCT REQUIREMENTS

| | | |
|---|---|---|
| A. | Primer | Dur-A-Glaze #4 WB |
| 1. | Percent Solids | 56 % |
| 2. | VOC | 2 g/L |
| 3. | Bond Strength to Concrete ASTM D 4541 | 550 psi, substrates fails |
| 4. | Hardness, ASTM D 3363 | 3H |
| 5. | Elongation, ASTM D 2370 | 9 % |
| 6. | Flexibility (1/4: Cylindrical mandrel), ASTM D 1737 | Pass |
| 7. | Impact Resistance, MIL D-2794 | >160 |
| 8. | Abrasion Resistance ASTM D 4060, CS 17 wheel, 1,000 g Load | 30 mg loss |
| B. | Broadcast Coat | Dur-A-Gard OPF |
| 1. | Percent Solids | 100 % |

| | | |
|---|---|---|
| 2. | VOC | 59 g/L |
| 3. | Compressive Strength, ASTM D 695 | 16,000 psi |
| 4. | Tensile Strength, ASTM D 638 | 3,800 psi |
| 5. | Flexural Strength, ASTM D 790 | 4,000 psi |
| 6. | Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles | 35 mg loss |
| 7. | Flame Spread/NFPA-101, ASTM E 84 | Class A |
| 8. | Impact Resistance MIL D-3134 | 0.025 inch Max |
| 9. | Water Absorption. MIL D-3134 | Pass |
| 10. | Potlife @ 70 F | 20-25 minutes |

C. Broadcast Coat and Grout Coat — Dur-A-Glaze #4 Water Clear

| | | |
|---|---|---|
| 1. | Percent Solids | 100 % |
| 2. | VOC | 3.8 g/L |
| 3. | Compressive Strength, ASTM D 695 | 11,200 psi |
| 4. | Tensile Strength, ASTM D 638 | 2,100 psi |
| 5. | Flexural Strength, ASTM D 790 | 5,100 psi |
| 6. | Abrasion Resistance, ASTM D 4060 C-10 Wheel, 1,000 gm load, 1,000 cycles | 29 mg loss |
| 7. | Flame Spread/NFPA-101, ASTM E 84 | Class A |
| 8. | Impact Resistance MIL D-24613 | 0.0007 inches, no cracking or delamination |
| 9. | Water Absorption. MIL D-24613 | Nil |
| 10. | Potlife @ 70 F | 20 minutes |

D. Topcoat — Poly-Thane #2 High Solids

| | | |
|---|---|---|
| 1. | Percent Solids | 70 % |
| 2. | VOC | 320.8 g/L |
| 3. | Flame Spread/NFPA-101, ASTM E 84 | Class A |
| 4. | Adhesion, ASTM 4541 | 600 psi |
| 5. | Hardness, ASTM D 3363 | 4H |
| 6. | QUA, UVA-373/1,500 hrs | Gloss Retention |
| 7. | Abrasion Resistance, ASTM D4060 CS 17 wheel (1,000 g load) 1,000 cycles | 10 mg loss |
| 8. | Pot Life 70 F | 2 hours |
| 9. | Working Time 70 F | 30 minutes |
| 10. | Cure Time | 12 hours |
| 11. | Chemical Resistance | 5-7 days |

## 2.4 MATERIALS

A. VOC Content of Liquid-Applied Flooring Components: Not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 PREPARATION

A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

B. Examine substrates, areas and conditions, with Applicator present, for compliance with requirements for maximum moisture content, installation tolerances and other conditions affecting flooring performance.

1. Verify that substrates and conditions are satisfactory for flooring installation and comply with requirements specified.

C. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.

D. Mechanical surface preparation

1. Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 3-4 as described by the International Concrete Repair Institute.
2. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
3. Where the perimeter of the substrate to be coated is not adjacent to a wall or curb, a minimum 1/4 inch key cut shall be made to properly seat the system, providing a smooth transition between areas. The detail cut shall also apply to drain perimeters and expansion joint edges.
4. Cracks and joints (non-moving) greater than 1/8 inch wide are to be chiseled or chipped-out and repaired per manufacturer’s recommendations.
5. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

E. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Roughen concrete substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab area in 24 hours or
    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
    c. If the vapor emission exceeds 75 % relative humidity or 3 lbs/1,000 sf/24 hrs then Dur-A-Flex, Inc Dur-A-Glaze MVP Primer moisture mitigation system must be installed prior to resinous flooring installation. Slab-on grade substrates without a vapor barrier may also require the moisture mitigation system.

4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

F. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

G. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

H. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

## 3.2 APPLICATION

A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.

3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

4. The system shall be applied in six distinct steps as listed below:

    a. Substrate preparation
    b. Priming
    c. First broadcast coat application with first chip broadcast
    d. Second broadcast coat with second chip broadcast
    e. Grout coat application,

f. Topcoat application

5. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
6. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
7. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
8. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

B. Primer

1. The primer shall be Dur-A-Glaze #4 WB2 that is mixed at the ratio of 1 part resin to 4 parts hardener per the manufacturer’s instructions.
2. The primer shall be applied by 1/8 inch notched squeegee and back rolled at the rate of 200-250 sf/gal to yield a dry film thickness of 4 mils.

C. Broadcast Coats

1. The broadcast coat shall be applied as a double broadcast system as specified by the Architect.
2. The broadcast coat shall be comprised of two components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener.
3. The resin shall be added to the hardener and thoroughly mixed by suitably approved mechanical means.
4. The first broadcast coat shall be applied over horizontal surfaces using the dip and roll, and back roll method at the rate of 300 sf/gal using the Dur-A-Gard OPF material.
5. Colored Chips shall be broadcast to excess into the wet material at the rate of 0.1-0.12lbs/sf.
6. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
7. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
8. Apply a second broadcast coat of resin shall be applied by flat squeegee then back rolled with a coverage rate of 200 sf/gal with the Dur-A-Glaze #4 Water Clear material.
9. Colored Chips shall be broadcast to excess at the rate of 0.1-0.12 lbs/sf.
10. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.
11. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.

D. Grout Coat

1. The grout coat shall be comprised of a Dur-A-Glaze # 4 Water Clear material that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer’s recommendations.
2. The grout coat shall be squeegee applied and back rolled with a coverage rate of 150 sf/gal.

E. Topcoat

1. The topcoat of Poly-Thane #2 High Solids shall be roller applied at the rate of 250-300 sf/gal to yield a dry film thickness of 4 mils.
2. The topcoat shall be comprised of a liquid resin and hardener that is mixed at the ratio of 2 parts resin to 1 part hardener per the manufacturer’s instructions.
3. The finish floor will have a nominal thickness of 40 mils.

F. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

G. Apply waterproofing membrane, where indicated, in manufacturer's recommended thickness.

H. Applying reinforcing membrane only to substrate cracks may be adequate for areas subject to moderate impact; consult manufacturers for recommendations..

I. Apply reinforcing membrane to substrate cracks.

J. Apply self-leveling slurry body coats in thickness indicated for flooring system.

K. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

L. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.

M. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

## 3.3 FIELD QUALITY CONTROL

A. Material Sampling: Owner may at any time, and any number of times during resinous flooring application, require material samples for testing for compliance with requirements.

B. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.

C. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.

D. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.4 PROTECTION

A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION

# SECTION 096816 - SHEET CARPETING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Tufted carpet and accessories for direct glue down installation.

B. Related Requirements:

1. Section 096513 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet.
2. Section 096900 "Access Flooring" for carpet tiles installed on access flooring.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include manufacturer's written data on physical characteristics and durability.
2. Include manufacturer's written installation recommendations for each type of substrate.

B. Sustainable Design Submittals:

1. Product Data: For adhesives, indicating VOC content.
2. Laboratory Test Reports: For flooring products, indicating compliance with requirements for testing and product requirements of CRI's "Green Label Plus" testing program.

C. Samples for Initial Selection: For each type of product if other than basis-of-design selections.

1. Include Samples of exposed edge, transition, and other accessory stripping involving color or finish selection.

D. Samples for Verification: For each of the following products and for each color and texture required including basis-of-design selections. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 12-inch- square Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch- long Samples.
3. Carpet Seam: 6-inch Sample.

## 1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Sample Warranties: For special warranties.

## 1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For carpet to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet.

## 1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced Installer who is certified by the International Certified Floor Covering Installers Association at the Master II certification level.

## 1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with CRI's "CRI Carpet Installation Standard."

## 1.8 FIELD CONDITIONS

A. Comply with CRI's "CRI Carpet Installation Standard" for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

C. Do not install carpet over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, and have pH range recommended by carpet manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.9 WARRANTY

A. Special Warranty for Carpet: Manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period.

1. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, and delamination.
3. Warranty Period: Lifetime from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TUFTED CARPET

A. Basis-of-Design Product: Subject to compliance with requirements provide Basis of Design: Lees “Faculty IV”, Broadloom Carpet from The Mohawk Group, or provide one of the following:

1. Altlas Carpet Mills
2. Bently Prince Street
3. Masland Contract Carpet.

B. Color: Duracolor; as selected by Architect from manufacturer's standard colors.

C. Dye Method: Yarn Dyed

D. Pattern: “Faculty IV / DK166”.

E. Fiber Content: 100 percent nylon 6, 6.

F. Face Yarn: Type 6,6 Antron Legacy nylon by Invista.

G. Pile Characteristic: Multilevel-loop pile.

H. Density: 5,492 oz./cu. yd. .

I. Pile Thickness: .118inches for finished carpet.

J. Stitches: 10.3 stitches per inch.

K. Gage: 1/12.

L. Yarn Weight: 26 oz./square yard

M. Backing System: Unibond FlexBloc by Lees.

N. Width: 12 feet.

O. Applied Soil-Resistance Treatment: DuraTech.

1. Antimicrobial Treatment: Manufacturer's standard material.

    a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

P. Performance Characteristics:

1. Appearance Retention Rating: Severe traffic, 3.5 minimum per ASTM D 7330.
2. Flooring Radiant Panel: Class One NFPA
3. Tuft Bind: Not less than 10 lbf per ASTM D 1335.
4. Delamination: Not less than 4 lbf/in. per ASTM D 3936.
5. Colorfastness to Crocking: Not less than 4, wet and dry, per AATCC 165.
6. Colorfastness to Light: Not less than 4 after 200 AFU (AATCC fading units) per AATCC 16, Option E.
7. Emissions: Provide carpet that complies with testing and product requirements of CRI's "Green Label Plus" program.

## 2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Seam Adhesive: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for sealing and taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

C. Metal Edge/Transition Strips: Extruded aluminum with mill finish of profile and width as selected by Architect, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Examine carpet for type, color, pattern, and potential defects.

B. Concrete Slabs: Verify that finishes comply with requirements specified in Section 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.

1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
c. Perform additional moisture tests recommended in writing by adhesive and carpet manufacturers. Proceed with installation only after substrates pass testing.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. General: Comply with CRI 104, Section 7.3, "Site Conditions; Floor Preparation," and with carpet manufacturer's written installation instructions for preparing substrates.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch, unless more stringent requirements are required by manufacturer's written instructions.

C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet manufacturers.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet.

## 3.3 CARPET INSTALLATION

A. Comply with CRI's "CRI Carpet Installation Standard" and carpet manufacturer's written installation instructions for the following:

1. Direct-glue-down installation.

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

C. Do not bridge building expansion joints with carpet.

D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders to comply with CRI 104, Section 15, "Patterned Carpet Installations" and with carpet manufacturer's written recommendations.

## 3.4 CLEANING AND PROTECTING

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.
3. Vacuum carpet using commercial machine with face-beater element.

B. Protect installed carpet to comply with CRI's "CRI Carpet Installation Standard."

END OF SECTION 096816

# SECTION 107516 - GROUND-SET FLAGPOLES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section includes ground-set flagpoles made from aluminum.

B. Owner-Furnished Material: Flags.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

### 1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

## 2.2 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Flagpole assemblies shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.

1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 100 miles per hour.
2. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

C. Accessibility: Cleat shall be accessible to a person seated in a wheelchair.

1. Mounting Height: Upper tip of cleat shall be 42 inches above finished grade or pavement.

## 2.3 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone or entasis-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. American Flagpole.
b. Concord Industries, Inc.
c. Eder Flag Manufacturing Company, Inc.

B. Exposed Height: 25 feet.

C. Construct flagpoles in one piece.

D. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch wall thickness with 3/16-inch steel bottom plate and support plate; 3/4-inch-diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

1. Flashing Collar: Same material and finish as flagpole.

## 2.4 FITTINGS

A. Finial Ball: Flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch spun aluminum with gold anodic finish.

B. External Halyard: Ball-bearing, nonfouling, revolving truck assembly of cast metal with continuous 5/16-inch-diameter, braided polypropylene halyard and 9-inch cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.

1. Halyards and Cleats: One at each flagpole.
2. Halyard Flag Snaps: Stainless-steel swivel snap hooks with neoprene or vinyl covers. Furnish two per halyard.

## 2.5 MISCELLANEOUS MATERIALS

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M.

B. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

C. Sand: ASTM C 33/C 33M, fine aggregate.

D. Elastomeric Joint Sealant: Single-component neutral-curing silicone joint.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

## 2.6 ALUMINUM FINISHES

A. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Architectural Class I.

1. Color: Black.
2. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. or, Contractor’s Option: High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1. Color and Gloss: Satin black.

# PART 3 - EXECUTION

## 3.1 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

D. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

E. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

F. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

## 3.2 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION 107516

# SECTION 311000 - SITE CLEARING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees and vegetation to remain.
2. Removing trees and other vegetation.
3. Clearing and grubbing.
4. Topsoil stripping.
5. Temporary erosion- and sedimentation-control measures.

B. Related Sections include the following:

1. Section 015000 "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.
2. Section 310000 "Earthwork" for soil materials, excavating, backfilling, and site grading.

### 1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of weeds, roots, and other deleterious materials.

### 1.4 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

### 1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place.

1.6 EXISTING UTILITIES

A. Owner will arrange for disconnecting, relocating and reconnecting existing utilities that serve existing structures before site clearing.

1. Verify that utilities have been disconnected and capped before proceeding with site clearing operations.

B. Locate and identify disconnected or abandoned utilities within the limit of work. Verify that such items will not interfere with construction.

C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Architect's written permission.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

## 3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

## 3.3 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ a qualified arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the qualified arborist.

## 3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within drip line of remaining trees.

## 3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Locate stockpile where indicated adjacent to project area.
2. Limit height of topsoil stockpiles to 72 inches.
3. Do not stockpile topsoil within drip line of remaining trees.
4. Stockpile surplus topsoil and allow for respreading deeper topsoil.

## 3.6 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them where directed on Owner's property adjacent to project area.

END OF SECTION 311000

# SECTION 323113 - CHAIN LINK FENCES AND GATES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Chain-link fences.
2. Horizontal-slide, motor-operated gates.

B. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for cast-in-place concrete equipment bases/pads for gate operators and controls and post footings.
2. Section 260000 "Electrical" for empty conduits for gate control power and controls.

### 1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Inspect and discuss electrical roughing-in, equipment bases, and other preparatory work specified elsewhere.
2. Review sequence of operation for each type of gate operator.
3. Review coordination of interlocked equipment specified in this Section and elsewhere.
4. Review required testing, inspecting, and certifying procedures.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Fence and gate posts, rails, and fittings.
b. Chain-link fabric, reinforcements, and attachments.
c. Accessories.
d. Gates and hardware.
e. Gate operators, including operating instructions and motor characteristics.

B. Shop Drawings: For each type of fence and gate assembly.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include accessories, hardware, gate operation, and operational clearances.
3. Gate Operator: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
4. Wiring Diagrams: For power, signal, and control wiring.

C. Samples for Verification: For each type of component with factory-applied finish, prepared on Samples of size indicated below:

1. Polymer-Coated Components: In 6-inch lengths for components and on full-sized units for accessories.

D. Delegated-Design Submittal: For structural performance of chain-link gate frameworks, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. This submittal may be included in the shop drawing submittal.

E. Delegated-Design Submittal: For electrical power and control systems for gate operators signed and sealed by the qualified professional engineer responsible for their preparation. This submittal may be included in the shop drawing submittal.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer.

B. Product Certificates: For each type of chain-link fence, operator, and gate.

C. Product Test Reports: For framework strength according to ASTM F 1043, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Sample Warranty: For special warranty.

## 1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For gate operators to include in emergency, operation, and maintenance manuals.

## 1.7 QUALITY ASSURANCE

A. Emergency Access Requirements: According to requirements of authorities having jurisdiction for gates with automatic gate operators serving as a required means of access.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.9 WARRANTY

A. Special Warranty: Installer agrees to repair or replace components of chain-link fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to comply with performance requirements.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
c. Faulty operation of gate operators and controls.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design chain-link gate frameworks including foundations.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design electrical power and control systems for gate operators.

1. Pre-engineered systems that meet performance requirements are acceptable in lieu of a delegated design.

C. Structural Performance: Chain-link fence and gate frameworks shall withstand the design wind loads and stresses for fence height(s) and under exposure conditions indicated according to ASCE/SEI 7.

1. Design Wind Load: 100 miles per hour.

a. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified.

D. Lightning Protection System: Maximum resistance-to-ground value of 25 ohms at each grounding location along fence under normal dry conditions.

E. Vehicular Slide Gate Operator shall be in compliance with Underwriter Laboratories Inc. (UL) Standard for Safety - Door, Drapery, Gate, Louver and Window Operators and Systems, UL 325 Fourth Edition; and Underwriters Laboratories Inc. (UL) Standard for

Safety - Tests for Safety-Related Controls Employing Solid-State Devices, UL 991 Second Edition.

F. Vehicular slide gate fabrication, construction and installation shall conform to ASTM F2200; Standard Specification for Automated Vehicular Gate Construction.

## 2.2 CHAIN-LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated below:

1. Fabric Height: Eight (8) feet.
2. Steel Wire for Fabric: Wire diameter of 0.148 inch.

    a. Mesh Size: 2 inches.
    b. Polymer-Coated Fabric: ASTM F 668, Class 2b fused and adhered to zinc-coated steel wire.

        1) Color: As selected by Architect from manufacturer's full range, according to ASTM F 934.

    c. Coat selvage ends of metallic-coated fabric before the weaving process with manufacturer's standard clear protective coating.

3. Selvage: Twisted top and knuckled bottom.

## 2.3 FENCE FRAMEWORK

A. Posts and Rails: ASTM F 1043 for framework, including rails, braces, and line; terminal; and corner posts. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 based on the following:

1. Fence Height: 96 inches.
2. Light-Industrial-Strength Material: Group IC-L, round steel pipe, electric-resistance-welded pipe.

    a. Line Post: 1.9 inches in diameter.
    b. End, Corner, and Pull Posts: 2.375 inches.

3. Horizontal Framework Members: Intermediate, top and bottom rails according to ASTM F 1043.

    a. Top Rail: 1.66 inches in diameter.

4. Brace Rails: ASTM F 1043.
5. Metallic Coating for Steel Framework:

a. Type A: Not less than minimum 2.0-oz./sq. ft. average zinc coating according to ASTM A 123/A 123M or 4.0-oz./sq. ft. zinc coating according to ASTM A 653/A 653M.
b. Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
c. External, Type B: Zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil-thick, zinc-pigmented coating.
d. Type C: Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. coating.
e. Coatings: Any coating above.

6. Polymer coating over metallic coating.

a. Color: Match chain-link fabric, according to ASTM F 934.

## 2.4 AUTOMATED VEHICULAR GATE OPERATIONAL DESCRIPTION

A. Provide motor-operated horizontal slide gates, gate operators and control devices at two locations as follows:

1. East Gate: Main entrance function.
2. West Gate: Main exit and operations entrance/exit function.

B. East Gate: Provide the following for controlled access.

1. Gate.
2. Operator.
3. Interior control station in Room 02 – ADMINISRTRATION.
4. Key fob reader at exterior side of gate to control entry.
5. Obstruction detection devices.

C. West Gate: Provide the following for free exiting.

1. Gate.
2. Operator.
3. Interior control station in Room 02 – ADMINISRTRATION.
4. Key fob reader at exterior side of gate to control entry.
5. Vehicle loop detector at interior side of gate to trigger opening.
6. Obstruction detection devices.

D. The following articles describe the requirements and components of the gate installation to be further defined in the delegated design submittals.

## 2.5 HORIZONTAL-SLIDE GATES

A. General: ASTM F 1184 for gate posts and single sliding gate types. Provide automated vehicular gates according to ASTM F 2200.

1. Classification: Type II Cantilever Slide, Class 1 with external or Class 2 with internal roller assemblies.

    a. Gate Frame Width and Height: 30 feet wide by 8 feet high, nominal, to match height of adjacent fence.

B. Pipe and Tubing:

1. Zinc-Coated Steel: Protective coating and finish to match fence framework.
2. Gate Posts: ASTM F 1184. Provide round tubular steel posts.
3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded or assembled with corner fittings.

D. Hardware: Provide components for motor-operated gates.

1. Hangers, Roller Assemblies, and Stops: Fabricated from galvanized steel, galvanized malleable iron, or mill-finished Grade 319 aluminum-alloy casting with stainless-steel fasteners.
2. Lock: Manufacturer's standard internal device.

## 2.6 FITTINGS

A. Provide fittings according to ASTM F 626.

B. Provide protective coating and finish to match fence framework.

## 2.7 GATE OPERATORS

A. Operators: Factory-assembled, automatic, gate-operating system designed for gate size, type, weight, and frequency of use. Control system shall have characteristics suitable for Project conditions, with control stations, safety devices, and weatherproof enclosures.

1. Operator design shall allow for removal of cover or motor without disturbing limit-switch adjustment and without affecting auxiliary emergency operation.
2. Electronic components shall have built-in troubleshooting diagnostic feature.
3. Unit shall be designed and wired for both right-hand/left-hand opening, permitting universal installation.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. UL Standard: Manufacture and label gate operators according to UL 325.

1. UL Class of Operation: III, IV.

D. Motors: Comply with NEMA MG 1.

1. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
2. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
3. Service Factor: 1.15.
4. Electrical Characteristics:

    a. Horsepower: 2.
    b. Voltage: 208 V ac, 3-phase, 60 hertz.

E. Gate Operators: Pedestal post mounted and as follows:

1. Mechanical Slide Gate Operators:

    a. Duty: Medium duty, commercial/industrial.
    b. Gate Speed: Minimum 60 feet per minute variable speed.
    c. Maximum Gate Weight: 2000 lb.
    d. Frequency of Use: 25 cycles per hour.
    e. Operating Type: Roller chain.
    f. Drive Type: Enclosed worm gear reducers, roller-chain drive.

F. Controls: Electric controls separated from gate and motor and drive mechanism, with NEMA 250, Type 4 enclosure for pedestal mounting and with space for additional optional equipment.

G. Control Devices:

1. Control Station: Momentary contact, button operated; located remotely from gate in Room 02-ADMINISTRATION. Key switch to lock out open and close buttons.

    a. Function: Open, stop, and close.

2. Key Fob Reader: Functions only when authorized key fob is presented. Programmable multiple-code system; face-lighted unit fully visible at night.

    a. Reader Type: Proximity.
    b. Features: Capable of monitoring and auditing gate activity.

3. Vehicle Loop Detector: System that includes automatic closing timer with adjustable time delay before closing, timer cut-off switch, and loop detector designed to open and close gate. Provide electronic detector with adjustable detection patterns, adjustable sensitivity and frequency settings, and panel indicator light designed to detect presence or transit of a vehicle over an embedded loop of wire and to emit a signal activating the gate operator. Provide number of loops consisting of multiple strands of wire, number of turns, loop size, and method of placement at location shown on Drawings, and as recommended in writing by detection system manufacturer for function indicated.

    a. Loop: Factory-preformed wire, in size indicated, for pave-over installation.

b. Obstruction Detection Devices: Provide each motorized gate with automatic safety sensor(s) where required to comply with UL 325 and authorities having jurisdiction. UL 325 requires a primary and secondary entrapment protection device for vehicular gates. Sensor devices include:

4. Internal Sensor: Built-in torque or current monitor senses gate is obstructed.
5. Sensor Edge: Contact-pressure-sensitive safety edge, profile, and sensitivity designed for type of gate and component indicated, in locations as follows. Connect to control circuit using take-up cable reel, self-coiling cable, or gate edge transmitter and operator receiver system.

    a. Along entire gate leaf leading edge.
    b. Along entire gate leaf trailing edge.
    c. Across entire gate leaf bottom edge.
    d. Along entire length of gate posts.
    e. Along entire length of gate guide posts.

6. Photoelectric/Infrared Sensor: Designed to detect an obstruction in gate's path when infrared beam in the zone pattern is interrupted.

7. Activation of sensor(s) causes operator to immediately function as follows:

    a. Action: Reverse gate in both opening and closing cycles and hold until clear of obstruction.

H. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop gate at fully open and fully closed positions.

I. Emergency Release Mechanism: Quick-disconnect release of operator drive system, permitting manual operation if operator fails. Control circuit power is disconnected during manual operation.

1. Type: Integral fail-safe release, allowing gate to be pushed open without mechanical devices, keys, cranks, or special knowledge.

J. Operating Features:

1. Digital Microprocessor Control: Electronic programmable means for setting, changing, and adjusting control features with capability for monitoring and auditing gate activity. Provide unit that is isolated from voltage spikes and surges.
2. System Integration: With controlling circuit board capable of accepting any type of input from external devices.
3. Automatic Closing Timer: With adjustable time delay before closing and timer cut-off switch.
4. Open Override Circuit: Designed to override closing commands.
5. Reversal Time Delay: Designed to protect gate system from shock load on reversal in both directions.
6. Maximum Run Timer: Designed to prevent damage to gate system by shutting down system if normal time to open gate is exceeded.
7. Clock Timer: Seven day, programmable for regular events.

K. Accessories:

1. Warning Module: Visual, strobe-light alarm sounding three to five seconds in advance of gate operation and continuing until gate stops moving and according to the U.S. Access Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

2. External electric-powered solenoid or magnetic lock with delay timer allowing time for lock to release before gate operates.
3. Instructional, Safety, and Warning Labels and Signs: According to UL 325.
4. Equipment Bases/Pads: Cast-in-place or precast concrete, depth not less than 12 inches, dimensioned and reinforced according to gate-operator component manufacturer's written instructions and as indicated in the delegated design.

## 2.8 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended in writing by manufacturer for exterior applications.

## 2.9 GROUNDING MATERIALS

A. Comply with requirements in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Connectors and Grounding Rods: Listed and labeled for complying with UL 467.

1. Connectors for Below-Grade Use: Exothermic welded type.
2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a certified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, underground structures, benchmarks, and property monuments.

## 3.3 CHAIN-LINK FENCE INSTALLATION

A. Install chain-link fencing according to ASTM F 567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts minimum 3 feet deep in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

    a. Concealed Concrete: Place top of concrete 2 inches below grade to allow covering with surface material.

D. Terminal Posts: Install terminal end, corner, and gate posts according to ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more. For runs exceeding 500 feet, space pull posts an equal distance between corner or end posts.

E. Line Posts: Space line posts uniformly at 10 feet o.c.

F. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

1. Locate horizontal braces at midheight of fabric 72 inches or higher, on fences with top rail, and at two-third fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fence posts. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

H. Intermediate and Bottom Rails: Secure to posts with fittings.

I. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2-inch bottom clearance between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

J. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts, with tension bands spaced not more than 15 inches o.c.

K. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric according to ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces at 24 inches o.c.

L. Fasteners: Install nuts for tension bands and carriage bolts on the side of fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

## 3.4 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation.

## 3.5 GATE-OPERATOR INSTALLATION

A. Install gate operators according to manufacturer's written instructions, aligned and true to fence line and grade.

B. Excavation: Hand-excavate holes for posts, pedestals, and equipment bases/pads, in firm, undisturbed soil to dimensions and depths and at locations according to gate-operator component manufacturer's written instructions and as indicated in the delegated design.

C. Vehicle Loop Detector System: Bury wire loop according to manufacturer's written instructions. Connect to equipment operated by detector.

D. Ground electric-powered motors, controls, and other devices according to NFPA 70 and manufacturer's written instructions.

## 3.6 GROUNDING AND BONDING

A. Comply with requirements in Section 260000 "Electrical."

B. Fence and Gate Grounding:

1. Ground for fence and fence posts shall be a separate system from ground for gate and gate posts.
2. Install ground rods and connections at maximum intervals indicated in the delegated design.
3. Ground fence on each side of gates and other fence openings.

    a. Bond metal gates to gate posts.
    b. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches below finished grade.

C. Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a ground rod located a maximum distance of 150 feet on each side of crossing.

D. Fences Enclosing Electrical Power Distribution Equipment: Ground according to IEEE C2 unless otherwise indicated.

E. Grounding Method: At each grounding location, drive a grounding rod vertically until the top is 6 inches below finished grade. Connect rod to fence with No. 6 AWG conductor. Connect conductor to each fence component at grounding location.

F. Connections:

1. Make connections with clean, bare metal at points of contact.
2. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
3. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
4. Make above-grade ground connections with mechanical fasteners.
5. Make below-grade ground connections with exothermic welds.
6. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

G. Bonding to Lightning Protection System: Ground fence and bond fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor according to NFPA 780.

## 3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests.

B. Prepare test reports.

## 3.8 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction,

throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Automatic Gate Operator: Energize circuits to electrical equipment and devices, start units, and verify proper motor rotation and unit operation.

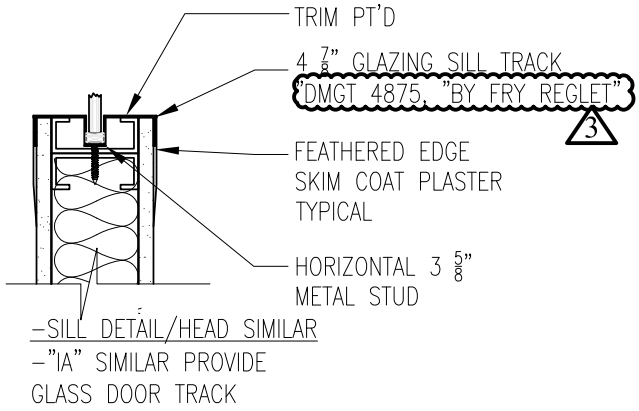
1. Hydraulic Operator: Purge operating system, adjust pressure and fluid levels, and check for leaks.
2. Test and adjust operators, controls, alarms, and safety devices. Replace damaged and malfunctioning controls and equipment.
3. Lubricate operator and related components.

C. Lubricate hardware and other moving parts.

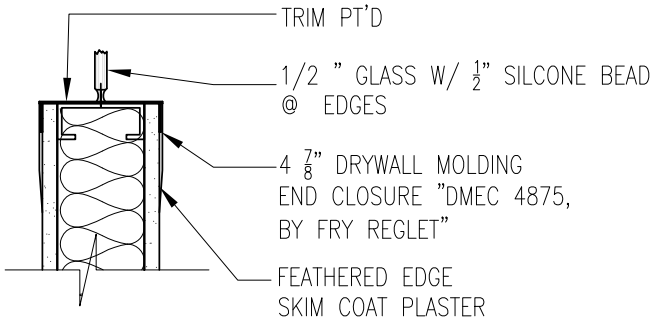
## 3.9 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain chain-link fences and gates.

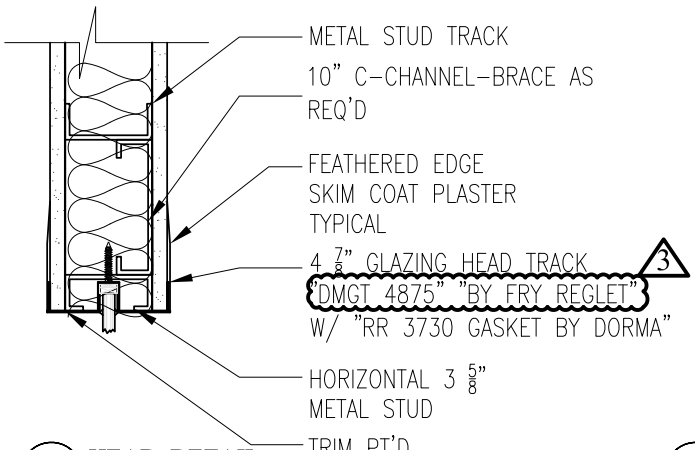
END OF SECTION 323113



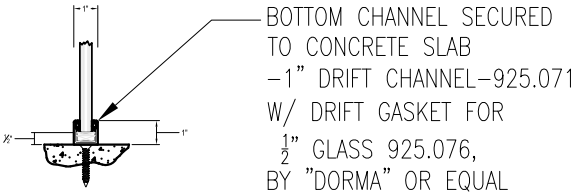

1 SILL DETAIL @ WALL
1 1/2" = 1'-0"




2 JAMB DETAIL
1 1/2" = 1'-0"

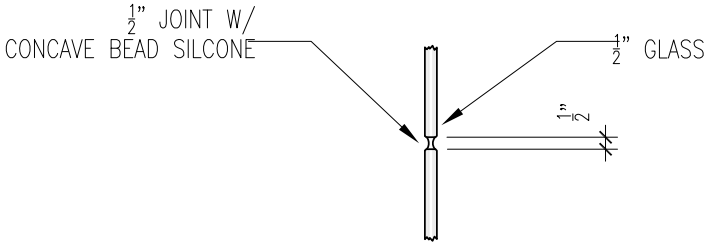



3 HEAD DETAIL
1 1/2" = 1'-0"




4 SILL DETAIL @ FLOOR
1 1/2" = 1'-0"

SILL/FLR DETAIL
@ INTERIOR WINDOWS




5 BUTTED GLASS DETAIL
1 1/2" = 1'-0"

CITY OF WORCESTER

**DEPARTMENT OF PUBLIC WORKS AND PARKS**
ARCHITECTURAL SERVICES DIVISION
50 SKYLINE DRIVE, WORCESTER, MA 01605

**SCALE:** 1/4" =1'-0"
**DATE:** 01/06/15
**REMARKS:**
ISSUED VIA ADDENDUM #1
REVISED ADDENDUM #3

**PROJECT TITLE:**
**REGIONAL EMERGENCY COMMUNICATIONS CENTER**
2 Coppage Drive, Worcester, MA 01603
**DRAWING TITLE:**
INTERIOR WINDOW DETAILS

**SHEET NUMBER:**
SKA-01
REVISED

## AIR–CONDITIONING UNIT

| UNIT NUMBER | LOCATION | FAN(S) | | | | | | DX EVAPORATOR COIL | | | | | | ELECTRIC DATA | | | | MANUFACTURER MODEL NUMBER (BASIS OF DESIGN) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CFM | STATIC PRESS.(IN.WG) | | QTY | HP EA | RPM | MBH | | SST (°F) | EAT (°F) | | FACE VELOCITY (FPM) (MAX) | MCA | V | ø | HZ | | |
| | | | TOTAL W/ DIRTY FILTERS | EXTERNAL | | | | TOTAL | SEN–SIBLE | | DB | WB | | | | | | | |
| AC–1 & 2 | TELCO/ELEC | 670 | -- | – | 1 | 95 W | – | 24 | 17.5 | – | 80 | 67 | – | 1.0 | 208 | 1 | 60 | MITSUBISHI PCA–A24KA4 | 1 2 3 |

1. UNIT SHALL BE SERVED BY DEDICATED AIR–COOLED CONDENSING UNIT, SEE SPECIFICATIONS FOR ACCESSORIES.
2. PROVIDE LITTLE GIANT CONDENSATE PUMP MODEL NUMBER VCMA–15ULS
3. INTERLOCK WITH CLEAN AGENT SYSTEM WHERE INDICATED ON PLANS. UPON ACTIVATION OF CLEAN AGENT SYSTEM, HVAC EQUIPMENT SHALL BE DE–ENERGIZED AND CONTROL DAMPERS SHALL BE CLOSED. COORDINATE WITH ELECTRICAL CONTRACTOR TO INSTALL A 2 POLE RELAY (LINE VOLTAGE) BETWEEN THE INDOOR AND OUTDOOR UNIT

## AIR–COOLED CONDENSER

| UNIT NO. | SERVICE | LOCATION | D.B. TEMP. (°F) | CONDENSER FAN(S) | | | ELECT. SERVICE | | | | MANUFACTURER MODEL NUMBER (BASIS OF DESIGN) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | NO. | HP EA. | CFM | MCA/MOCP | VOLTS | PHASE | HZ | | |
| CU–1 & 2 | AC–1 | ROOF | 95 | 1 | 75 W | 1940 | 18/30 | 208 | 1 | 60 | MITSUBISHI PUZ–A24NHA4 | 1 2 3 |

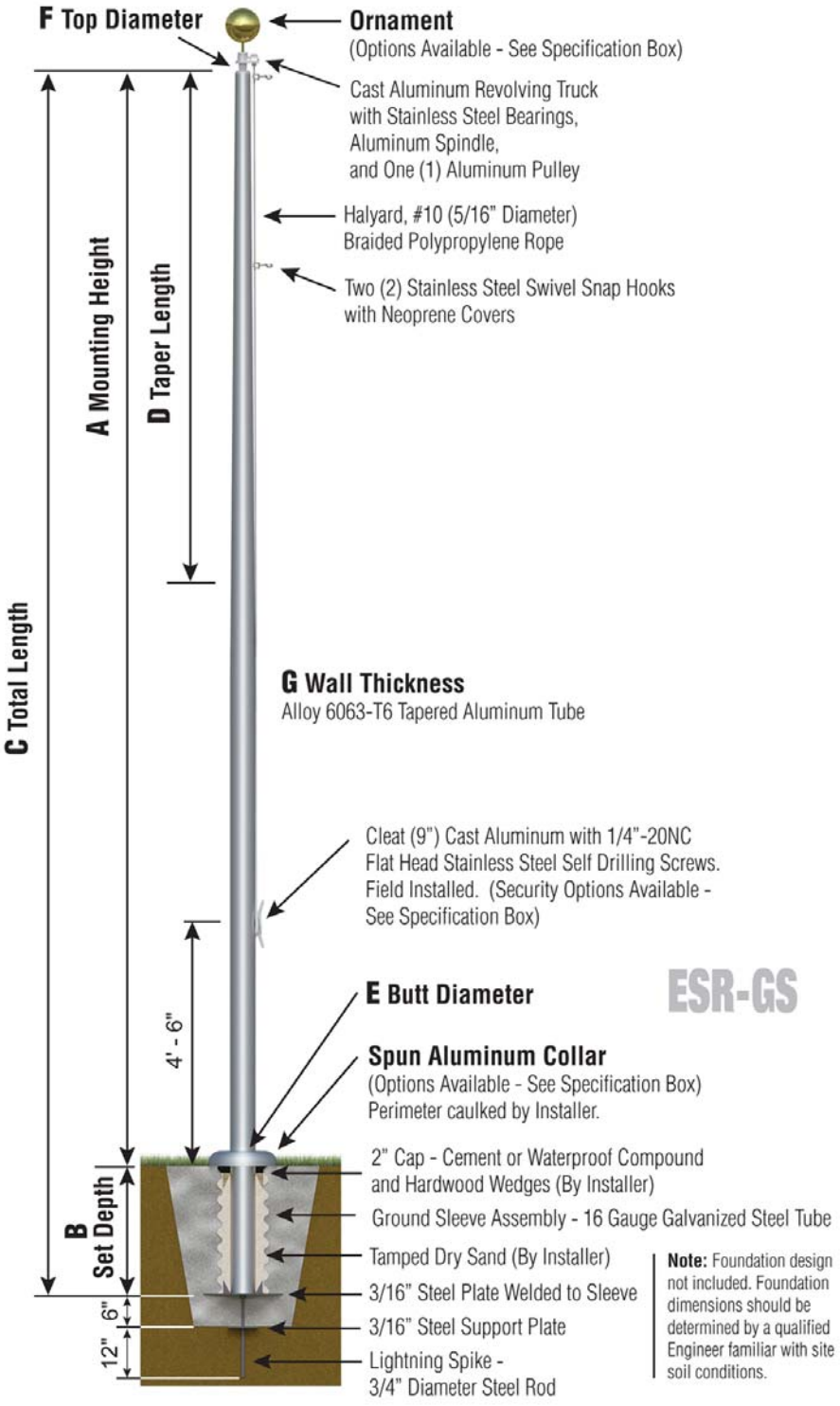
1. PROVIDE 0°F CONTROLS, SEE SPECIFICATIONS FOR ACCESSORIES.
2. PROVIDED FUSED DISCONNECT SWITCH.
3. INTERLOCK WITH CLEAN AGENT SYSTEM WHERE INDICATED ON PLANS. UPON ACTIVATION OF CLEAN AGENT SYSTEM, HVAC EQUIPMENT SHALL BE DE–ENERGIZED AND CONTROL DAMPERS SHALL BE CLOSED. COORDINATE WITH ELECTRICAL CONTRACTOR TO INSTALL A 2 POLE RELAY (LINE VOLTAGE) BETWEEN THE INDOOR AND OUTDOOR UNIT

BLW Engineers, Inc.
311 Great Road, Post Office Box 1551
Littleton, Massachusetts 01460
T: 978.486.4301 F: 978.428.0067
www.blwengineers.com
*HVAC * ELECTRICAL * PLUMBING * FIRE PROTECTION*

| | | | |
|---|---|---|---|
| Project: RECC - WORCESTER, MA | | | Sketch No.: SKH-01 |
| Title: TELCO/ELEC RM A/C UNIT AND CONDENSER REVISIONS | | | |
| Date: 12/30/14 | Scale: NO SCALE | Project No.: 12136.15 | |
| Drawn By: VS | Rev. No.: 001 | Dwg. Ref.: H0.3 | |

**Architectual Elite Series - ESR**
External Single Revolving
Rope Halyard
Ground Set Installation

# ESR25B51 - AA





Clear Anodized


Anodized Clear


Heavy Duty Collar


Heavy Duty Cleat

| Accessory Specifications |
|---|
| Anodized - Clear (AA), Clear Anodized Ball (90065-003), Heavy Duty Spun Collar (90038-004), Standard 9" Heavy Duty Aluminum Cleat (90037S) |

| Specifications |
|---|
| A. Mounting Height: 25' |
| B. Set Depth: 2'-6" |
| C. Total Length: 27'-6" |
| D. Taper Length: 11'-0" |
| E. Butt Diameter: 5.000" |
| F. Top Diameter: 3.000" |
| G. Wall Thickness: 0.125" |
| Flagpole Sections: 1 |
| Flagpole Weight: 117 lbs. |
| Max Flag Size: 5' x 8' |
| Max Wind Speed w/ Flag: 100 mph |
| Max Wind Speed No Flag: 130 mph |

| Notes |
|---|
| Foundation:<br>The 16" galvanized steel tube shall be encased in, a minimum of 12" thick, 4,000 PSI concrete, to a minimum depth of 4'. |

| | |
|---|---|
| Customer Name: City of Worcester | |
| Dealer: | |
| Project: Regional Emergency Command Center | Location: 2 Coppage Drive |