



## R G Architects, LLC

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RGA No. 15001  
4 November 2016

### ADDENDUM NO. 4

LAKE FOREST SCHOOL DISTRICT  
Lake Forest High School – Renovations  
5423 Killens Pond Rd.  
Felton, Delaware 19943

R G Architects  
200 West Main Street  
Middletown, DE 19709  
Phone: 302-376-8100 (phone)  
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BIDS DUE:

**Tuesday, November 15, 2016 at 2:00 p.m.**

LOCATION:

**Lake Forest School District  
Central Business Office  
5423 Killens Pond Rd.  
Felton, Delaware 19943  
Attn: Karl Stahre**

### NOTICE TO ALL BIDDERS

#### 1.0 GENERAL NOTES:

**1.1 NOTE THAT THE BID DUE TIME AND DATE HAVE CHANGED. The new time and date are listed above.**

1.2 Revised Bid schedule is as follows:

1. The bids are due by **2:00 p.m. on 15 November 2016.**
2. Questions regarding the bid documents will be received until **2:00 p.m. on 9 November 2016.**  
All questions **must** be submitted **in writing** (via email, fax or mail) to R G Architects. Neither R G Architects, its consultants, nor the Owner will answer questions verbally. **No questions should be submitted or will be answered after that date.**
3. The last day for addenda to be issued shall be **11 November 2016.**

1.3 Bidders are hereby notified that this Addendum shall be and hereby becomes part of their Contract Documents, and shall be attached to the Project Manual for this project.

1.4 The following items are intended to revise and clarify the Drawings and Project Manual, and shall be included by the Bidder in their proposal.

1.5 Bidders shall verify that their Sub-bidders are in full receipt of the information contained herein.

1.6 A copy of the current bid set register is available upon request indicating individuals that have purchased project documents from R G architects.

1.7 All addenda will be sent out to the registered plan holders via email. Contractors are encouraged to keep an eye on their email accounts during the bidding periods for such updates. All interested parties are also encouraged to monitor [www.mymarketplace.delaware.gov](http://www.mymarketplace.delaware.gov), where this project's cumulative solicitation documents are available for viewing.

1.8

## **2.0 Revisions to the SPECIFICATIONS**

2.1 Replace Section 00 41 13 BID FORM in its entirety with specification section included with this addendum.

2.2 Replace Section 01 21 00 ALLOWANCES in its entirety with specification section included with this addendum.

2.3 Add Specification Section 08 33 23 – OVERHEAD COILING DOORS, The entire specification section is included with this addendum.

2.4 Add Specification Section 10 20 00 – LOUVERS AND VENTS. The entire specification section is included with this addendum.

2.5 Add Specification Section 33 31 13 – CHAIN LINK FENCES AND GATES, The entire specification section is included with this addendum.

## **3.0 Revisions to the DRAWINGS**

3.1 Attached Sheet A10-4 Shall be included as part of Alternate #2.

## **4.0 QUESTIONS & ANSWERS**

Q.1. Please provide size and depth of existing pump station to be demolished/filled. Please confirm DNREC permitting, if required, for the onsite wastewater system demolition will be handled by the owner.

A. An allowance has been established for the removal of the Wastewater Treatment Plant and the Lift Station. This allowance does not cover the modifications to the electrical systems shown on sheets CC-09 or the work shown on sheet E1.1. The electrical work associated with the removal of the plant and station are to be included in the base bid.

Q.2. Are there to be foul poles for the two baseball fields? If yes, please specify.

A. Yes, foul poles shall be provided as follows:

Manufacturer:	Sportsfield Specialties
Model:	LGFPW420 – 20' Foul Pole with Wing.
Color:	Yellow for baseball field white at softball field

Q.2. For the outfield fence on both ball fields, is a top cap for the 4' fence to be included in the bid price.

A. Yes

Q.3. Drawing CE14, note Q shows to install plant material, this is not shown, please advise.

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- A. Plant materials referenced in note Q are not part of this bid package.
- Q.4. Drawing CE14, note N calls for shrubs, there are none shown. Please advise.
- A. Shrubs referenced in note N are not part of this bid package
- Q.5. Drawing CE16, note A calls to install orange safety fence at each facility location. Which building will this be required?
- A. The term ‘facility’ references SWM facilities, not buildings. The orange fencing is required around each SWM facility.
- Q.6. Is the intent with the soccer fields / softball field to till in the existing grass, grade using existing topsoil in place and plant Bermuda sod or are we to cut down existing soil 6” remove from site, import new topsoil, grade then sod?
- A. The existing topsoil on site may be used, however, any additional soils needed to achieve final grades will be the responsibility of the successful bidder.
- Q.7. Please clarify the location of Bermuda grass, and whether the areas are to be seeded or sodded.
- A. Reference note on sheet CC-10 regarding bermuda grass. The area within the fenced practice fields on sheet CC-10 shall receive Bermuda grass seed, not sod.
- A. On sheet CC-16 the note referencing Bermuda grass outfield is incorrect. The turf areas inside the softball field fence shall receive seed mixture 7 on the attached Seed mixture chart.
- Q.8. Can we bid the project using the following assumptions? 1. Existing topsoil can be re-used onsite. 2. No soil amendments are required for existing topsoil.
- A. Yes, both assumptions are correct.
- Q.9. What is to be done if anything with the existing electrical running under the footing line of the Agri-science addition?
- A. Any existing electrical service lines shall be maintained and protected. A plastic sleeve shall be utilized at locations where electrical lines conflict with the new foundation.
- Q.10. Dwg CC12 requires bleachers to be relocated at the Owner’s direction. Is it possible to establish a new location for the bleachers for bidding purposes?
- A. Relocation of the existing bleachers shall be handled by the owner.
- Q.11. Can existing millings/ gravel salvaged from the site be used in the proposed work?
- A. The existing gravel and millings may be used in the proposed work, with the exception of any of the SWM facilities.
- Q.12. For bidding purposes please establish the depth of the existing gravel roads?
- A. Assume 8” of depth.
- Q.13. Referencing Alternate #1. Please confirm new sidewalks are limited to approx. 85 l.f. running from the Killens Pond Rd entrance into the bus loop
- A. Yes, that is correct

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- Q.14. Alternate 2, Drawing S-102 shows new steel beams in the existing field house. Details are needed to show how these beams will be connected.
- A. All new steel to existing CMU should be connected as shown on “typical steel bearing on existing CMU” detail on sheet S-511.
- Q.15. Please provide top of wall detailing at new and existing walls that terminate against the existing pre-cast concrete plank and new steel decking in the locker rooms.
- A. Refer to wall types and wall sections on sheet A30-2
- Q.16. There are no existing wall to new wall details at the Field house expansion. Please provide.
- A. The inner wythe (cmu) of the new Masonry walls shall be anchored to the existing masonry wall with helical masonry ties (Simpson Strong-Tie HELIST254000 1/4" x 40" Helical Stitching Tie) every 16" oc vertically, and the exterior brick veneer shall be constructed to within 3/8" of the existing masonry wall. The gap shall be closed via approved backer rod and sealant.
- Q.17. Are allowances to be included as part of base bid?
- A. Yes, all allowances shall be included as part of the base bid.

**5.0 ATTACHMENT LIST:**

- 5.1 Specification Section 00 41 13 BID FORM
- 5.2 Specification Section 01 21 00 ALLOWANCES
- 5.3 Specification Section 08 33 23 – OVERHEAD COILING DOORS
- 5.4 Specification Section 10 20 00 – LOUVERS AND VENTS
- 5.5 Specification Section 33 31 13 – CHAIN LINK FENCES AND GATES
- 5.6 Seed Mixture chart
- 5.7 Drawing Sheet A10-4 – Roof Plan & Details, Alternate #2
- 5.8 Sketch E-SK1 – First Floor Plan – Power & Special Systems – New Work

End of Addendum No. 4



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**BID FORM**

**ALLOWANCE ACKNOWLEDGEMENT**

ALLOWANCE #1: We have included an allowance amount equal to \$20,000.00 for miscellaneous costs not identified on the bid documents. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: \_\_\_\_\_

ALLOWANCE #2: We have included an allowance amount equal to \$20,000.00 for Flooring Replacement and Storefront modifications. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: \_\_\_\_\_

ALLOWANCE #3: We have included an allowance amount equal to \$60,000.00 for Irrigation System. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: \_\_\_\_\_

ALLOWANCE #4: We have included an allowance amount equal to \$25,000.00 for Wastewater Treatment Plant & Lift Station Removal. I/We have reviewed and familiarized ourselves with the requirements contained in Specification Section 01 21 00 Allowances.

Acknowledged by: \_\_\_\_\_

**ADDENDA ACKNOWLEDGEMENT**

By initialing next to each line below, I/We hereby acknowledge receipt of the following addenda, and further acknowledges that the information and changes in these Addenda has been taken into account, and the price(s) include any cost/schedule impact they may have.

<u>Addendum No.</u>	<u>Date Issued</u>	<u>#Pages</u>	<u>Confirmation of receipt</u>
1	25 Oct 2016	7	_____
2	1 Nov 2016	15	_____
3	3 Nov 2016	36	_____
4	4 Nov 2016	36	_____

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**BID FORM**

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within \_\_\_\_\_ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By \_\_\_\_\_ Trading as \_\_\_\_\_  
(Individual's / General Partner's / Corporate Name)  
\_\_\_\_\_  
(State of Corporation)

Business Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness: \_\_\_\_\_ By: \_\_\_\_\_  
(SEAL) ( Authorized Signature )  
\_\_\_\_\_  
( Title )  
Date: \_\_\_\_\_

**ATTACHMENTS**

- Sub-Contractor List
- Non-Collusion Statement
- Bid Security
- (Others as Required by Project Manuals)

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**BID FORM**

**SUBCONTRACTOR LIST**

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor **must be listed for each category** where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the *Owner*, it is **required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<b><u>Subcontractor Category</u></b>	<b><u>Subcontractor</u></b>	<b><u>Address (City &amp; State)</u></b>	<b><u>Subcontractors tax payer ID # or Delaware Business license #</u></b>
1. Demolition	_____	_____	_____
2. Sitework	_____	_____	_____
3. Paving	_____	_____	_____
4. Fencing	_____	_____	_____
5. Turf Field Installer	_____	_____	_____
6. Track Surface Installer	_____	_____	_____
7. Masonry	_____	_____	_____
8. Roofing	_____	_____	_____
9. Mechanical	_____	_____	_____
10. Electrician	_____	_____	_____

**BID FORM**

**NON-COLLUSION STATEMENT**

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date (*to the Office of Management and Budget, Division of Facilities Management*).

All the terms and conditions of (*Project or Contract Number*) have been thoroughly examined and are understood.

**NAME OF BIDDER:** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE  
(TYPED):** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE  
(SIGNATURE):** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**ADDRESS OF BIDDER:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**E-MAIL:** \_\_\_\_\_

**PHONE NUMBER:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_ . NOTARY PUBLIC \_\_\_\_\_ .

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**

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**BID FORM**

**AFFIDAVIT  
OF  
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

**Contractor/Subcontractor Name:** \_\_\_\_\_

**Contractor/Subcontractor Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Authorized Representative (typed or printed):** \_\_\_\_\_

**Authorized Representative (signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_. NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
  - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
  - 2. Any unused monies of the allowance shall be returned to the owner via a credit change order at the end of the project, and will be reflected in the final application for payment.
- B. Types of allowances include the following:
  - 1. Lump-sum allowances.
- C. Related Sections include the following:
  - 1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
  - 2. Division 01 Section "Unit Prices" for procedures for using unit prices.
  - 3. Division 01 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
  - 4. Divisions 02 through 49 Sections for items of Work covered by allowances.

## 1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

#### 1.4 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

#### 1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

#### 1.6 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

#### 3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

### 3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Include an allowance entitled “General Owner’s Allowance”, in the amount of \$20,000. This allowance will be utilized by the owner for owner-elected changes to the work. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Applications for Payment.
- B. Allowance No.2: Include an allowance entitled “Storefront & Flooring Allowance”, in the amount of \$20,000.00. This allowance will be utilized for flooring replacement and storefront modifications. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Application for Payment.
- C. Allowance No.3: Include an allowance entitled “Irrigation System Allowance”, in the amount of \$60,000.00. This allowance will be utilized for installation of underground irrigation systems. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Application for Payment.
- D. Allowance No.4: Include an allowance entitled “Wastewater Treatment Plant & Lift Station Removal”, in the amount of \$25,000.00. This allowance will be utilized for the demolition and removal of the abandoned wastewater treatment plant and lift station indicated on sheet CC-09. Any or all unused allowance monies shall be returned to the owner via a credit change order at the end of the project. This allowance shall be carried as an individual line-item on the Application for Payment.

END OF SECTION 01 21 00

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## 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. This Section includes manually and electric-motor operated overhead coiling doors:
- B. Related Sections include the following:
  - 1. Division 03 Section "Precast Structural Concrete".
  - 2. Division 04 Section "Unit Masonry:
  - 3. Division 05 Section "Metal Fabrications" for miscellaneous steel supports.
  - 4. Division 05 Section "Security Metal Fasteners" for all fasteners in inmate and inmate/staff areas.
  - 5. Division 08 Section "Door Hardware" for lock cylinders and keying.
  - 6. Division 28 for building fire alarm connections.
  - 7. Division 26 Sections for electrical service and connections for powered operators and accessories.

### 1.3 PERFORMANCE REQUIREMENTS

- A. Overhead coiling service doors:
  - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components.
  - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- B. Overhead coiling insulated doors:
  - 1. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components.
  - 2. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- C. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

- D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

#### 1.4 SUBMITTALS

- A. Reference Division 01 "Submittal Procedures"; submit the following items:
  - 1. Completed Acceptance Certification confirming compliance with requirements of this Section.
  - 2. Test Data confirming compliance with Performance Requirements article.
  - 3. Product Data.
  - 4. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
  - 5. Quality Assurance/Control Submittals:
    - a. Provide proof of manufacturer ISO 9001:2000 registration.
    - b. Provide proof of manufacturer and installer qualifications.
    - c. Provide manufacturer's installation instructions.
  - 6. Closeout Submittals:
    - a. Operation and Maintenance Manual.
    - b. Certificate stating that installed materials comply with this specification.

#### 1.5 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer Qualifications: ISO 9001:2000 registered and a minimum of five years experience in producing doors of the type specified.
  - 2. Installer Qualifications: Manufacturer's approval.

#### 1.6 DELIVERY STORAGE AND HANDLING

- A. Reference Division 01 "Product Requirements".
- B. Follow manufacturer's instructions.

#### 1.7 WARRANTY

- A. Standard Warranty: Two years from date of substantial completion against defects in material and workmanship.

- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis-of-Design: The design for Overhead Coiling Service Doors is based on "Overhead Door Corp"., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: [www.overheaddoor.com](http://www.overheaddoor.com). E-mail: [sales@overheaddoor.com](mailto:sales@overheaddoor.com). Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
1. Cornell.
  2. Cookson.
  3. Approved Equal

### 2.2 INSULATED OVERHEAD COILING SERVICE DOORS

- A. Industrial Doors: Overhead Door Corporation, 625 Series Service Doors (Exterior Insulated Doors). DOORS 107A and 107B
1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
    - a. Curved profile type C-187 for doors up to 15 feet 4 inches (4.67 m) wide, fabricated of:
      - 1) 18 gauge galvanized steel.
- B. Flat profile type F-265I for doors up to 40 feet (12.19 m) wide.
- C. Front slat fabricated of:
1. 24 gauge glvanized steel.
- D. Back slat fabricated of:
1. 24 gauge glvanized steel.
    - a. Slat cavity filled with CFC-free foamed-in-place, polyurethane insulation
- E. Weatherseals:
1. Vinyl bottom seal.
- F. Bottom Bar:
1. Two stainless steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides

- G. Guides:
    - 1. Three stainless steel angles minimum thickness 1/8 inch (3 mm) for doors over 15 feet 4 inches (4.67 m) wide or high.
  - H. Brackets:
    - 1. Stainless steel to support counterbalance, curtain and hood.
  - I. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
  - J. Hood:
    - 1. Stainless steel, 24 gauge hood with intermediate supports as required.
  - K. Manual (Back-Up) Operation:
    - 1. Chain hoist for doors up to 96 SF
- 2.3 Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
- A. Sensing Edge Protection:
    - 1. Electric sensing edge.
  - B. Operator Controls:
    - 1. Push-button and key operated control stations with open, close, and stop buttons.
    - 2. Controls for both interior and exterior location.
    - 3. Controls flush mounted.
  - C. Motor Voltage: 115/208 single phase, 60 Hz.
- 2.4 Locking:
- A. Cylinder lock for electric operation with interlock switch.
- 2.5 Wall Mounting Condition:
- A. Between jambs mounting.
- 2.6 Vision Lites: Provide with 3 inch by 5/8 inch (76 mm by 16 mm) uniformly spaced openings.
- A. Provide with Plexiglas covers over openings.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
- C. Commencement of work by installer is acceptance of substrate.

## 3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Follow manufacturer's installation instructions.

## 3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

## 3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

## 3.5 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

**END OF SECTION 083323**

## 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. Fixed, formed-metal louvers.
- B. Related Sections include the following:
  - 1. Division 7 Section "Joint Sealants" for sealants installed in perimeter joints between louver frames and adjoining construction.
  - 2. Division 9 Section "Painting (Professional Line Products)" for field painting louvers.
  - 3. Division 15 Sections for louvers that are a part of mechanical equipment.
  - 4. Division 16 Sections for electrical power connections for motor-operated adjustable metal louvers.

## 1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

## 1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.
  - 1. Wind Loads: Determine loads based on pressures as indicated by local codes.
- B. Thermal Movements: Provide louvers that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- C. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

#### 1.5 SUBMITTALS

- A. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.
- B. Samples for Initial Selection: For units with factory-applied color finishes.
- C. Samples for Verification: For each type of metal finish required.
- D. Qualification Data: For professional engineer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
  1. AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

#### 1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

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

- a. Airline Products Co.
- b. Airolite Company (The).
- c. American Warming and Ventilating, Inc.
- d. Arrow United Industries.
- e. Carnes Company, Inc.
- f. Cesco Products.
- g. Construction Specialties, Inc.
- h. Dowco Products Group; Safe-Air of Illinois, Inc.
- i. Greenheck.
- j. Industrial Louvers, Inc.
- k. Louvers & Dampers, Inc.
- l. Metal Form Manufacturing Company, Inc.
- m. NCA Manufacturing, Inc.
- n. Nystrom Building Products.
- o. Reliable Products; Hart & Cooley, Inc.
- p. Ruskin Company; Tomkins PLC.
- q. Vent Products Company, Inc.

B. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

## 2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy 6063-T5 or T-52.
- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Aluminum Castings: ASTM B 26/B 26M, alloy 319.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G90 (Z275) zinc coating, mill phosphatized.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304, with No. [4] [6] finish.
- F. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.
  1. Use types and sizes to suit unit installation conditions.
  2. Use hex-head or Phillips pan-head screws for exposed fasteners, unless otherwise indicated.
- G. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
- H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

### 2.3 FABRICATION, GENERAL

- A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- C. Maintain equal louver blade spacing to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
  - 1. Frame Type: Exterior flange, unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.
  - 1. Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
  - 2. Exposed Mullions: Where indicated, provide units with exposed mullions of same width and depth as louver frame. Where length of louver exceeds fabrication and handling limitations, provide interlocking split mullions designed to permit expansion and contraction.
  - 3. Exterior Corners: Prefabricated corner units with mitered blades with concealed close-fitting splices and with semirecessed mullions at corners.
- G. Where indicated, provide subsills made of same material as louvers or extended sills for recessed louvers.
- H. fasteners, or both, as standard with louver manufacturer, concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

### 2.4 FIXED, FORMED-METAL LOUVERS

- A. Horizontal, Drainable-Blade Louver:
  - 1. Louver Depth: 4 inches (100 mm).
  - 2. Frame and Blade Material and Nominal Thickness: Galvanized steel sheet, of thickness required to comply with structural performance requirements, but not less than 0.052 inch (1.3 mm) for frames and 0.040 inch (1.0 mm) for blades.
  - 3. Mullion Type: Exposed.
  - 4. Performance Requirements:

5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

## 2.5 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
  1. Screen Location for Fixed Louvers: Interior face.
  2. Screening Type: Insect screening.
- B. Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
  1. Metal: Same kind and form of metal as indicated for louver to which screens are attached.
  2. Finish: Mill finish, unless otherwise indicated.
  3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.
- D. Louver Screening for Aluminum Louvers:
  1. Insect Screening: Aluminum, 18-by-16 (1.4-by-1.6-mm) mesh, 0.012-inch (0.30-mm) wire.
  2. Insect Screening: Stainless steel, 18-by-18 (1.4-by-1.4-mm) mesh, 0.009-inch (0.23-mm) wire.

## 2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish louvers after assembly.

## 2.7 GALVANIZED STEEL SHEET FINISHES

- A. Surface Preparation: Clean surfaces of dirt, grease, and other contaminants. Clean welds, mechanical connections, and abraded areas and repair galvanizing according to ASTM A 780. Apply a conversion coating suited to the organic coating to be applied over it.
- B. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply an air-dried primer immediately after cleaning and pretreating.
- C. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat, with a minimum dry film thickness of 1 mil (0.025 mm) for topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).
  1. Color and Gloss: Match Architect's sample.

- D. Powder-Coated Finish: Prepare, treat, and coat galvanized metal louvers to comply with resin manufacturer's written instructions and as follows:
1. Prepare louvers by thoroughly removing grease, dirt, oil, flux, and other foreign matter.
  2. Treat prepared louvers with zinc-phosphate pretreatment, rinse, and seal surfaces.
  3. Apply thermosetting polyester or acrylic urethane powder coating with cured-film thickness not less than **1.5 mils (0.04 mm)**.
  4. Color and Gloss: Match Architect's sample.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

#### 3.3 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

## 3.4 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
  - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 10200

## 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. Gates: swing.

- B. Related Sections:

- 1. Division 03 Section "Cast-in-Place Concrete" for cast-in-place concrete post footings.

## 1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Chain-link fence and gate framework shall withstand the effects of gravity loads.

## 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated, include construction details, material descriptions, dimensions of individual components and profiles, and finishes for chain-link fences and gates.

- 1. Fence and gate posts, rails, and fittings.
- 2. Chain-link fabric, reinforcements, and attachments.
- 3. Gates and hardware.

- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show accessories, hardware, gate operation, and operational clearances.

- C. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:

- 1. Polymer finishes.
- 2. Gate hardware.

- D. Warranty: Sample of special warranty.

## 1.5 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at project site.
  - 1. Coordination of new fencing installation and removal of existing fencing.

## 1.6 PROJECT 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.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer/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. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Five (5) years from date of Substantial Completion.

## PART 2 - PRODUCTS

## 2.1 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. Comply with CLFMI Product Manual and with requirements indicated below:
  - 1. Fabric Height: As indicated on Drawings.
  - 2. Steel Wire Fabric: Wire with a diameter of 0.148 inch (3.76 mm), 9 gauge.
    - a. Mesh Size: 2 inches (50 mm).
    - b. Polymer-Coated Fabric: ASTM F 668, Class 2b over zinc-coated steel wire.
      - 1) Color: Black, complying with ASTM F 934.
    - c. Coat selvage ends of fabric that is metallic coated before the weaving process with manufacturer's standard clear protective coating.
  - 3. Selvage: Twisted top and knuckled bottom.

## 2.2 FENCE FRAMING

- A. Posts and Rails: Comply with ASTM F 1043 for framing, 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: As indicated on Drawings.
  2. Eight Foot (8') Fences: Material Group IA, round steel pipe, Schedule 40.
    - a. Line Post: 2 7/8 inches (60 mm) in diameter.
    - b. End, Corner and Pull Post: 2 7/8 inches (60 mm).
  3. Three and Four Foot (3' and 4') Fences: Material Group IA, round steel pipe, Schedule 40.
    - a. Line Post: 1 7/8 inches (48 mm) in diameter.
    - b. End, Corner and Pull Post: 1 7/8 inches (48 mm) in diameter.
  4. Horizontal Framework Members: Top rails complying with ASTM F 1043.
    - a. Top Rail: 1 5/8 inches (42 mm) in diameter.
  5. Brace Rails: Comply with ASTM F 1043, 1 5/8 inches (42 mm) in diameter.
  6. Metallic Coating for Steel Framing:
    - a. Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M.
  7. Polymer coating over metallic coating.
    - a. Color: Black, complying with ASTM F 934.

## 2.3 TENSION WIRE

- A. Polymer-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, tension wire complying with ASTM F 1664, Class 2b over zinc-coated steel wire.
1. Color: Black, complying with ASTM F 934.

## 2.4 SWING GATES

- A. General: Comply with ASTM F 900 for gate posts and both single and double swing gate types.
1. Gate Leaf Width: As indicated.
  2. Gate Fabric Height: As indicated.
- B. Pipe and Tubing:

1. Zinc-Coated Steel: Comply with ASTM F 1043 and ASTM F 1083; protective coating and finish to match fence framing.
2. Gate Posts: Round tubular steel.
3. Gate Frames and Bracing: Round tubular steel.

C. Frame Corner Construction: Welded.

D. Hardware:

1. Hinges: 360-degree inward and outward swing.
2. Latches permitting operation from both sides of gate with provision for padlocking accessible from both sides of gate.
3. Padlock and Chain: Owner furnished.
4. Closer: Manufacturer's standard.

## 2.5 FITTINGS

A. General: Comply with ASTM F 626.

B. Post Caps: Provide for each post.

1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: For each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Round-steel tubing not less than 6 inches (152 mm) long.

E. Tension and Brace Bands: Pressed steel.

F. Tension Bars: Steel, length not less than 2 inches (50 mm) shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Steel, hot-dip galvanized after threading rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: According to ASTM F 626.

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:
  - a. Hot-Dip Galvanized Steel: 0.106-inch- (2.69-mm-) diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

I. Finish:

1. Metallic Coating for Pressed Steel or Cast Iron: Not less than 1.2 oz. /sq. ft. (366 g /sq. m) zinc.

- a. Polymer coating over metallic coating.

## 2.6 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable 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.

## 2.7 FENCE GROUNDING

- A. Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.
  - 1. Material above Finished Grade: Aluminum.
  - 2. Material on or below Finished Grade: Copper.
  - 3. Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.
- B. Connectors and Grounding Rods: Comply with UL 467.
  - 1. Connectors for Below-Grade Use: Exothermic welded type.
  - 2. Grounding Rods: Copper-clad steel, 5/8 by 96 inches (16 by 2440 mm).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for 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 (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

### 3.3 INSTALLATION, GENERAL

- A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
  - 1. Install fencing on established boundary lines inside property line.

### 3.4 CHAIN-LINK FENCE INSTALLATION

- A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.
- B. Post Setting: Set posts 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.
- C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.
- D. Line Posts: Space line posts uniformly at 10 feet (3 m) o.c.
- E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. 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 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.
- F. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (610 mm) o.c. Install tension wire in locations indicated before stretching fabric. Provide horizontal tension wire at the following locations:
  - 1. Extended along bottom of fence fabric. Install bottom tension wire within 6 inches (152 mm) of bottom of fabric and tie to each post with not less than same diameter and type of wire.
- G. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. 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. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches (50 mm) 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.

- I. 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 (380 mm) o.c.
- J. 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 per 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 (300 mm) o.c. and to braces at 24 inches (610 mm) o.c.
- K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

### 3.5 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 and lubricate where necessary.

### 3.6 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. Lubricate hardware and other moving parts.

### 3.7 DEMONSTRATION

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

END OF SECTION 323113

Figure 3.4.3.3a Seed mixes and recommended seeding dates

PERMANENT SEEDING AND SEEDING DATES											
Seeding Mixtures		Seeding Rate <sup>1</sup>		Optimum Seeding Dates <sup>2</sup> O = Optimum Planting Period A = Acceptable Planting Period							Remarks
Mix No.	Certified Seed <sup>3</sup>			Coastal Plain			Piedmont			All <sup>4</sup>	
	Well Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
1	Tall Fescue Weeping Lovegrass	140 10	3.2 0.23	A O	O A	A A	A O	O A	A A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Lovegrass very difficult to mow; Germinates only in hot weather
2	Deertongue Sheep Fescue Common Lespedeza <sup>5</sup> Inoculated	30 30 15	0.69 0.69 0.35	A O A	O A O	A A A	A O A	O A O	A A A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Good wildlife cover and food
3	Tall Fescue (Turf-type) or Strong Creeping Red Fescue or Perennial Ryegrass plus Flatpea <sup>5</sup>	50 50 50 15	1.15 1.15 1.15 0.34	O A O	A O A	O O O	O A O	O A O	O O O	Add 100 lbs./ac. Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass or Redtop plus White Clover <sup>5</sup>	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O A O	A O A	O O O	O A O	O A O	O O O	Add 100 lbs./ac. Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass <sup>6,7</sup> or Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
6	Tall Fescue (turf type) (Blend of 3 cultivars)	150	3.5	O	A	O	O	A	O		Managed filter strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A	O	O	A	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem <sup>7</sup> Indian Grass Little Bluestem <sup>7</sup> Creeping Red Fescue plus one of: Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A		O	A			All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill.  Creeping Red Fescue will provide erosion protection while the warm season grasses get established.



DELAWARE  
EROSION  
& SEDIMENT  
CONTROL  
HANDBOOK